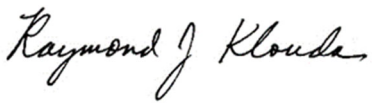




Engineering Test Report No. 2600005-01

Report Date	September 21, 2026	
Manufacturer Name	Caterpillar Inc	
Manufacturer Address	100 NE Adams St Peoria, IL 61629	
Equipment Under Test Model No.	5G Telematics Radio – PL645	
Date Received	July 14, 2026	
Test Dates	July 30, August 19 and 22, 2026	
Specifications	FCC "Code of Federal Regulations" Title 47 Part 15, Subpart B Innovation, Science, and Economic Development Canada, ICES-003	
Test Facility	Elite Electronic Engineering, Inc. 1516 Centre Circle, Downers Grove, IL 60515	FCC Reg. Number: 269750 IC Reg. Number: 2987A CAB Identifier: US0107
Signature		
Tested by	Javier Cardenas	
Signature		
Approved by	Raymond J. Klouda, Registered Professional Engineer of Illinois – 44894	
PO Number	SBJA83479	

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Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart B and Innovation, Science, and Economic Development Canada, ICES-003 test specifications. The data presented in this test report pertains to the EUT on the test date specified. Any electrical or mechanical modifications made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification. This report must not be used to claim product certification, approval, or endorsement by A2LA, NIST, or any agency of the Federal Government.

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1. Report Revision History

Revision	Date	Description
–	21 SEP 2026	Initial Release of Engineering Test Report No. 2600005-01

2. Introduction

This document presents the results of a series of electromagnetic compatibility (EMC) tests that were performed on the 5G Telematics Radio to determine compliance with the radiated emission requirements with new antennae options (hereinafter referred to as the Equipment Under Test (EUT)).

The EUT was identified as follows:

EUT Identification	
Description	5G Telematics Radio
Model No.	PL645
Serial No.	260623016003008D (External Antenna) 260619016008008D (Internal Antenna)
Software/Firmware Version	Linux Version: v6.17.4-10-g85617921cf35 OS Release: Buildroot 2025.08.1 (pkg83003) NAD Project Rev.: WCM598EGLBTR02A08M8G_OCPU_F02_02.001
Size of EUT	238 mm x 143 mm x 33 mm
Number of Interconnection Wires	3
Type of Interconnection Wires	RS485, CAN, TE Connectivity Connector
Highest Internal Frequency of the EUT	6GHz

The EUT listed above was used throughout the test series.

3. Power Input

The EUT was powered by 12VDC from a twisted pair contained in either a 3ft or 35ft harness, depending on the requirements of the test setup.

4. Grounding

The EUT was not grounded.

5. Support Equipment

The EUT was submitted for testing along with the following support equipment:

Description	Model #	S/N
Support EUT	PL645	260619016002008D
Media Converter	TE-1405	88W2221M
Support Laptop	Precision 5570	C002054151
GNSS Simulator	GSG-5	182135
Fiber Isolation Box	---	Box 2
Fiber Converters	NS-205FC	NS205FCCROSBKDD00033 NS205FCCROMJKENX0005
optoLAN Transceiver	IN:194602	15-006311 15-006313

6. Interconnect Leads

The following interconnect cables were submitted with the test item:

Item	Description
RS485	Connected EUT and Support EUT to Support Laptop
CAN	Connected EUT to Support EUT
TE Connectivity Connector	Connected EUT to Media Converter

7. Modifications Made to the EUT

No modifications were made to the EUT during the testing.

8. Modes of Operation

The EMC tests were performed with the EUT operating in the test mode described below.

8.1. Tx Standby

This mode was achieved by applying 12VDC to the EUT with the support equipment attached. The support equipment software was used to configure the EUT into the proper operating mode.

9. Test Specifications

The tests were performed to selected portions of, and in accordance with the following test specifications:

- Federal Communications Commission "Code of Federal Regulations", Title 47, Chapter I, Subchapter A, Part 15, Subpart B
- ICES-003, Issue 7, October 15, 2020, "Information Technology Equipment (including Digital Apparatus)"
- RSS-Gen, Issue 5, February 2021, Amendment 2, "General Requirements for Compliance of Radio Apparatus"
- ANSI C63.4-2014, "American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"

10. Test Plan

No test plan was provided. Instructions were provided by personnel from Caterpillar Inc and used in conjunction with the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart B and Innovation, Science, and Economic Development Canada, ICES-003, and ANSI C63.4-2014 specifications.

11. Deviation, Additions to, or Exclusions from Test Specifications

There were no deviations, additions to, or exclusions from the test specifications during this test series.

12. Laboratory Conditions

The following were the laboratory conditions while the EMC tests were performed:

Ambient Parameters	Value
Temperature	24.5°C
Relative Humidity	40%
Atmospheric Pressure	1017mb

13. Summary

The following EMC tests were performed, and the results are shown below:

Test Description	Test Requirements	Test Methods	Equipment Class	Results
RF Radiated Emissions	FCC 15B 15.109 ISED ICES-003, Section 3.2.2	ANSI C63.4:2014	A	Conforms

14. Sample Calculations

For Radiated Emissions:

The resultant field strength (FS) is a summation in decibels (dB) of the receiver meter reading (MTR), the antenna correction factor (AF), and the cable loss factor (CF). If an external preamplifier is used, the total is reduced by its gain (-PA). If a distance correction (DC) is required, it is added to the total.

$$\text{Formula 1: FS (dB}\mu\text{V/m)} = \text{MTR (dB}\mu\text{V)} + \text{AF (dB/m)} + \text{CF (dB)} + (-\text{PA (dB)}) + \text{DC (dB)}$$

To convert the Field Strength dB μ V/m term to μ V/m, the dB μ V/m is first divided by 20. The Base 10 AntiLog is taken of this quotient. The result is the Field Strength value in μ V/m terms.

$$\text{Formula 2: FS (}\mu\text{V/m)} = \text{AntiLog}[(\text{FS (dB}\mu\text{V/m)})/20]$$

15. Statement of Conformity

The Caterpillar Inc 5G Telematics Radio, Model No. PL645, Serial No. 260623016003008D (External Antenna), did fully conform to the selected requirements of FCC "Code of Federal Regulations" Title 47 Part 15, Subpart B and Innovation, Science, and Economic Development Canada, ICES-003.

16. Certification

Elite Electronic Engineering Incorporated certifies that the information contained in this report was obtained under conditions which meet or exceed those specified in the FCC "Code of Federal Regulations" Title 47 Part 15, Subpart B and Innovation, Science, and Economic Development Canada, ICES-003 test specifications. The data presented in this test report pertains to the EUT as received by the customer on the test date specified. Any electrical or mechanical modifications made to the EUT subsequent to the specified test date will serve to invalidate the data and void this certification.

17. Photographs of EUT





18. Equipment List

Eq ID	Equipment Description	Manufacturer	Model No.	Serial No.	Frequency Range	Cal Date	Due Date
APW10	Preamplifier	Planar	PE2-35-120-5R0-10-12-SFF	PL11685/1241	1-18GHz	3/18/2026	3/18/2027
NTA2	BILOG ANTENNA	TESEQ	6112D	28040	25-2000MHz	6/21/2024	8/23/2026
NWQ1	Double Ridged Waveguide (3M)	ETS-Lindgren	3117	66655	1-18GHz	7/13/2026	7/13/2028
NWV0	DOUBLE RIDGED WAVEGUIDE ANTENNA	ETS LINDGREN	3119	164466	400MHZ-6GHZ	NOTE 1	
R29F	3M ANECHOIC CHAMBER NSA	EMC TEST SYSTEMS	3M ANECHOIC		30MHZ-18GHZ	6/1/2025	6/1/2027
RBG3	EMI Analyzer	Rohde & Schwarz	ESW44	101592	2HZ-44GHZ	4/10/2026	4/10/2027
SMA57	POWER SUPPLY	VOLTEQ	HY3030EX	220401514	30V/30A	NOTE 1	
WKA1	SOFTWARE, UNIVERSAL RCV EMI	ELITE	UNIV_RCV_EMI	1	---	I/O	
XPQ4	HIGH PASS FILTER	K&L MICROWAVE	11SH10-4800/X20000-O/O	1	4.8-20GHZ	9/16/2025	9/16/2027
XPQ6	FILTER	K&L MICROWAVE	11SH10-9000/U2000-O/O	2	5000-5800 MHZ	9/16/2025	9/16/2027

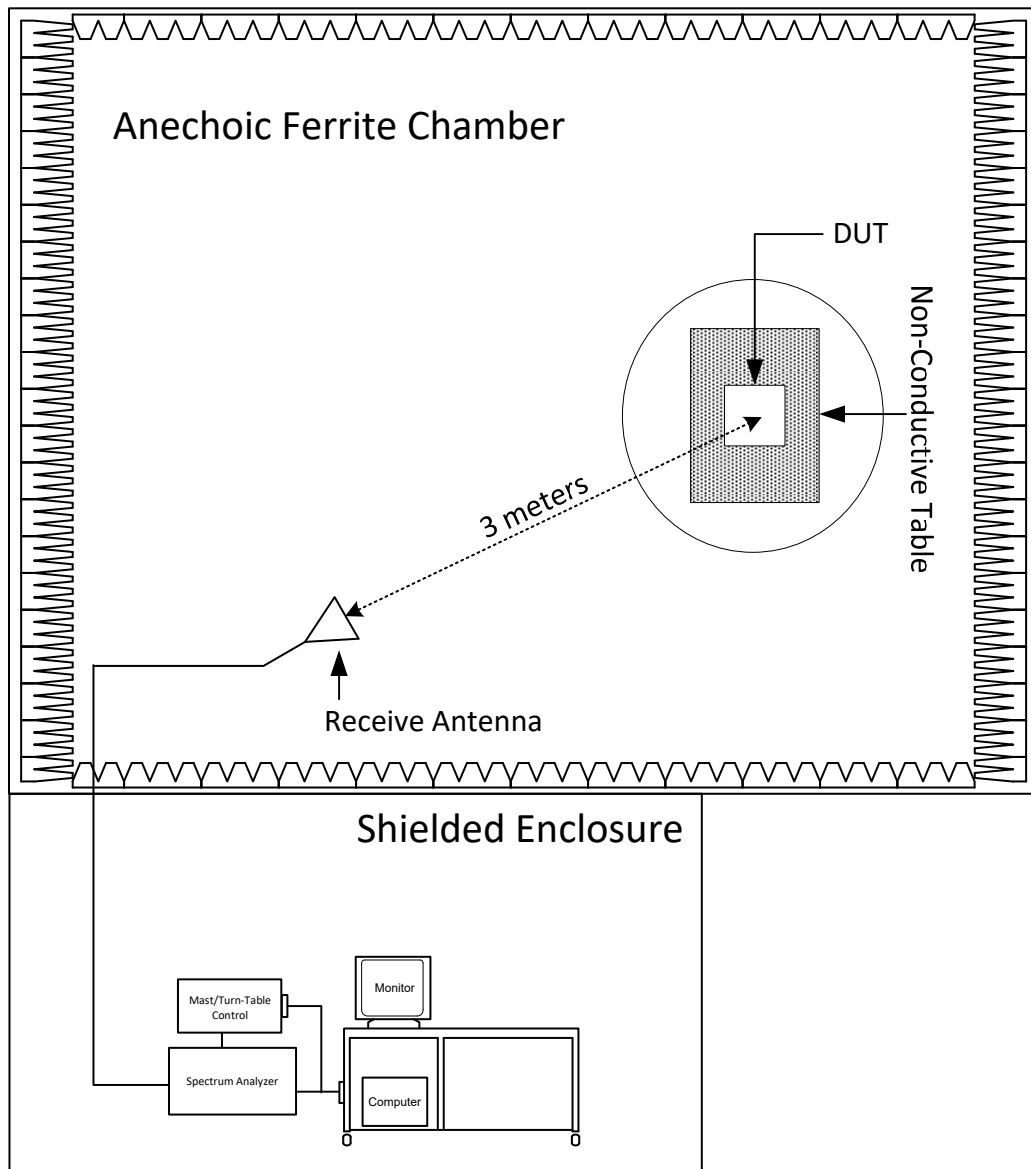
N/A: Not Applicable

I/O: Initial Only

CNR: Calibration Not Required

NOTE 1: For the purpose of this test, the equipment was calibrated over the specified frequency range, pulse rate, or modulation prior to the test or monitored by a calibrated instrument.

19. Block Diagram of Test Setup



Radiated Measurements Test Setup

20. RF Radiated Emissions

EUT Information	
Manufacturer	Caterpillar Inc
EUT	5G Telematics Radio
Model No.	PL645
Serial No.	260623016003008D (External Antenna) 260619016008008D (Internal Antenna)
Mode	Tx Standby

Test Site Information	
Setup Format	Tabletop
Type of Test Site	Semi-Anechoic Chamber
Test Site Used	R29F
Type of Antennas Used	Below 1GHz: Bilog (or equivalent) Above 1GHz: Double-ridged waveguide (or equivalent)
Highest Internal Frequency	6GHz
Highest Measurement Frequency	30GHz
Notes	The cables were manually maximized during the preliminary emissions sweeps. The cable arrangement which resulted in the worst-case emissions was utilized.

Measurement Uncertainty	
Measurement Type	Expanded Measurement Uncertainty
Radiated disturbance (electric field strength on an open area test site or alternative test site) (30 MHz – 1000 MHz)	3.64
Radiated disturbance (electric field strength on an open area test site or alternative test site) (1 GHz – 6 GHz)	4.18

Requirements
The field strength of radiated emissions from unintentional radiators shall not exceed the values in the following tables.

FCC Part 15 Class A Radiated Emissions Limits (30MHz to 1GHz)		
Frequency of Emission (MHz)	Quasi-peak Field Strength Limit at 10m ($\mu\text{V/m}$)	Quasi-peak Field Strength Limit at 10m ($\text{dB}\mu\text{V/m}$)
30 – 88	90	39
88 – 216	150	43.5
216 – 960	210	46.5
Above 960	300	49.5
FCC Part 15 Class A Radiated Emissions Limits (Above 1GHz)		
Frequency of Emission (MHz)	Average Field Strength Limit at 10m ($\mu\text{V/m}$)	Average Field Strength Limit at 10m ($\text{dB}\mu\text{V/m}$)
Above 1000	300	49.5
Peak radio frequency emissions shall not exceed 20dB above the maximum permitted average emission limit.		

ICES-003 Class A Radiated Emissions Limits (30MHz to 1GHz)		
Frequency Range (MHz)	Quasi-peak Field Strength Limit at 10 m (dBµV/m)	
30 – 88	40	
88 – 216	43.5	
216 – 230	46.4	
230 – 960	47	
960 – 1000	49.5	
ICES-003 Class A Radiated Emissions Limits (At and Above 1GHz)		
Frequency Range (GHz)	Average Field Strength at 3m (dBµV/m)	Peak Field Strength at 3m (dBµV/m)
1 – F _M	60	80
F _M = highest measurement frequency		

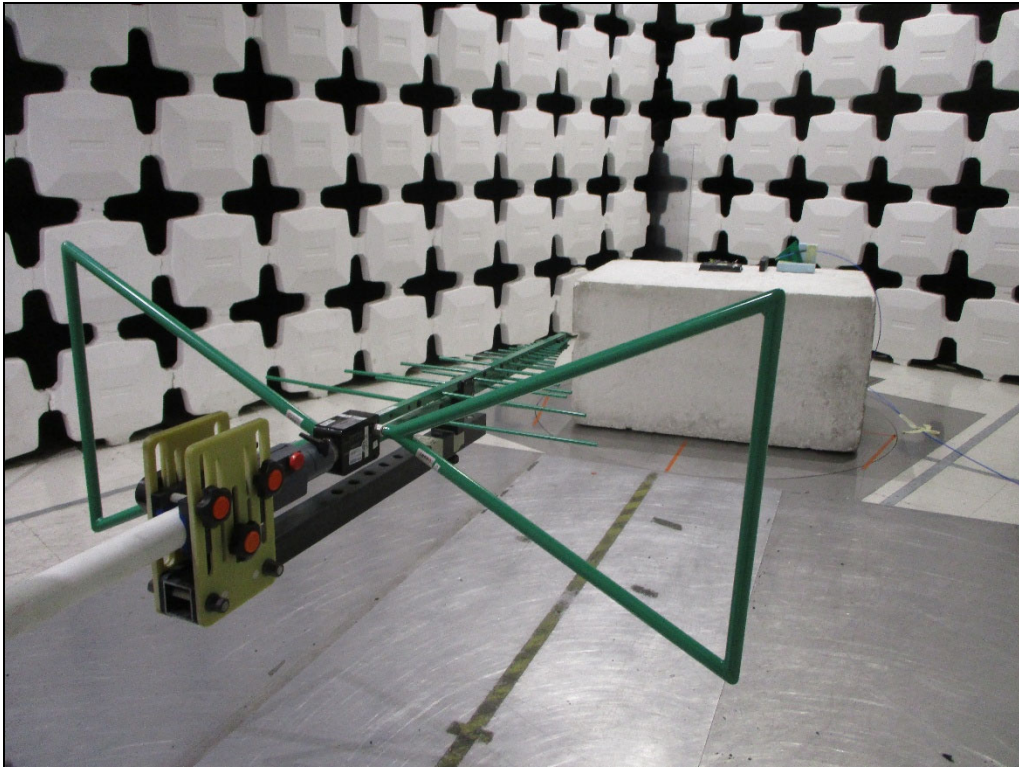
Procedure

Since a quasi-peak detector and an average detector require long integration times, it is not practical to automatically sweep through the quasi-peak and average levels. Therefore, radiated emissions from the EUT were first scanned using a peak detector and automatically plotted. The frequencies where significant emission levels were noted were then remeasured using the quasi-peak detector or average detector.

The EUT and all peripheral equipment were placed on an 80cm high non-conductive stand. The broadband measuring antenna was positioned at a 3 meter distance from the EUT. The frequency range from 30MHz to 1GHz was investigated using a peak detector function with the bilog antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The frequency range from 1GHz to 30GHz was investigated using a peak detector function with the double ridged waveguide antenna at several heights, horizontal and vertical polarization, and with several different orientations of the EUT with respect to the antenna. The maximum levels for each antenna polarization were plotted. The data was then processed by the computer to equivalent field intensity at 10 meters using linear extrapolation. A -10.5dB ($-10.5\text{dB} = 20 * \text{Log}(3\text{m}/10\text{m})$) distance correction factor has automatically been applied to the plotted emissions data.

Final radiated emissions were performed on all significant broadband and narrowband emissions found in the exploratory sweeps using the following methods:

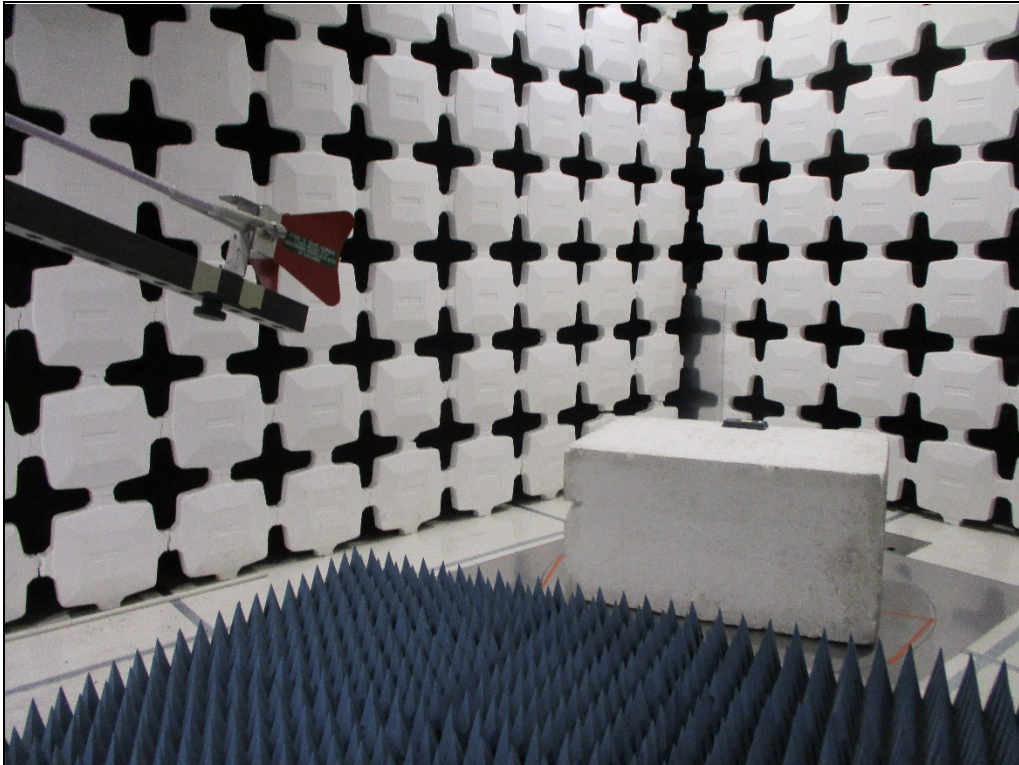
- 1) Measurements from 30MHz to 1GHz were made using a quasi-peak detector and a broadband bilog antenna. Measurements above 1GHz were made using an average detector and a broadband double ridged waveguide antenna.
- 2) To ensure that maximum or worst case, emission levels were measured, the following steps were taken:
 - a) The EUT was rotated so that all sides were exposed to the receiving antenna.
 - b) Since the measuring antenna is linearly polarized, both horizontal and vertical field components were measured.
 - c) The measuring antenna was raised and lowered from 1 to 4 meters for each antenna polarization to maximize the readings.
 - d) For hand-held or body-worn devices, the EUT was rotated through three orthogonal axes to determine which orientation produces the highest emission relative to the limit.



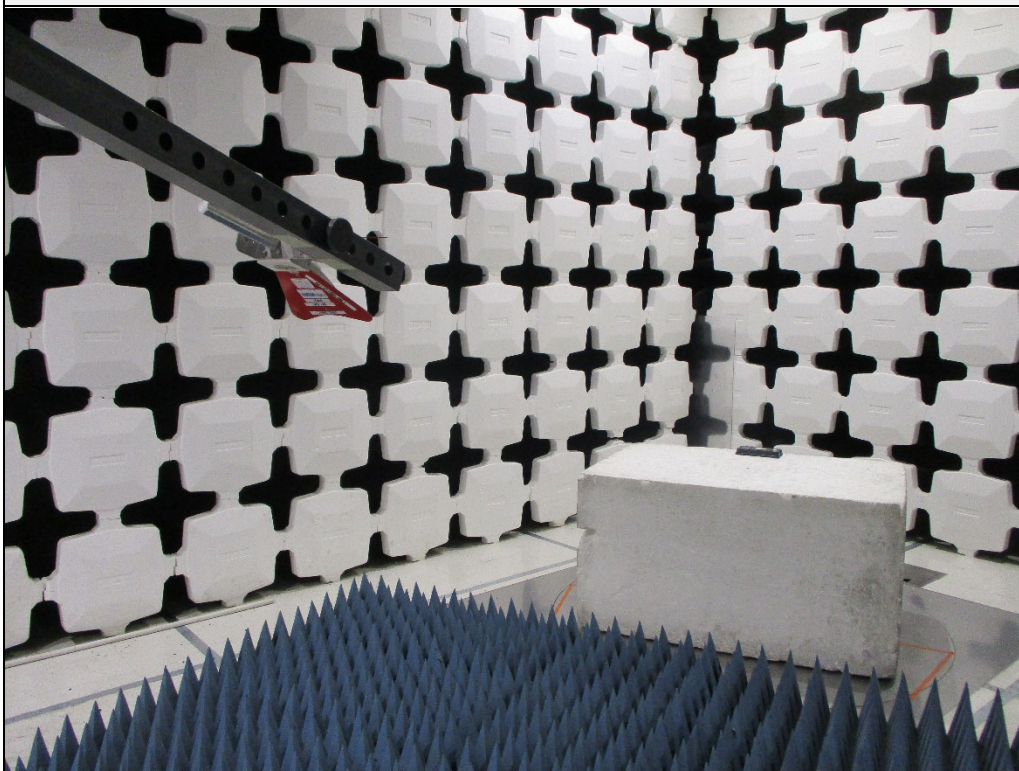
Test Setup for Radiated Emissions: 30MHz to 1GHz, Horizontal Polarization



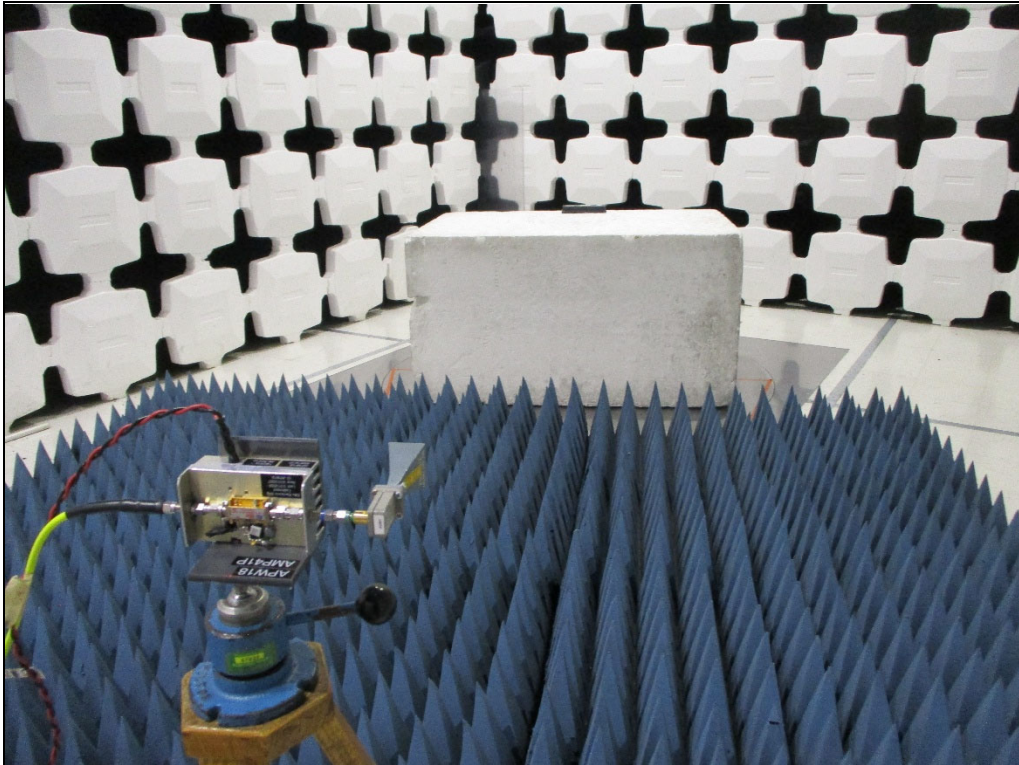
Test Setup for Radiated Emissions: 30MHz to 1GHz, Vertical Polarization



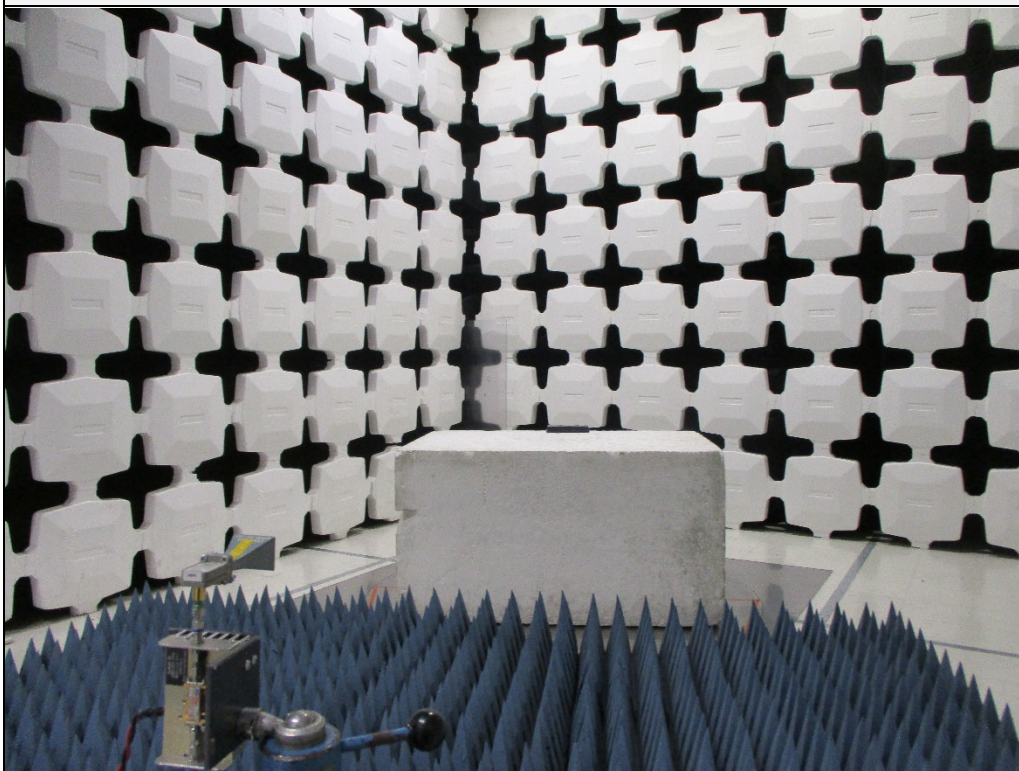
Test Setup for Radiated Emissions: 1GHz to 18GHz, Horizontal Polarization



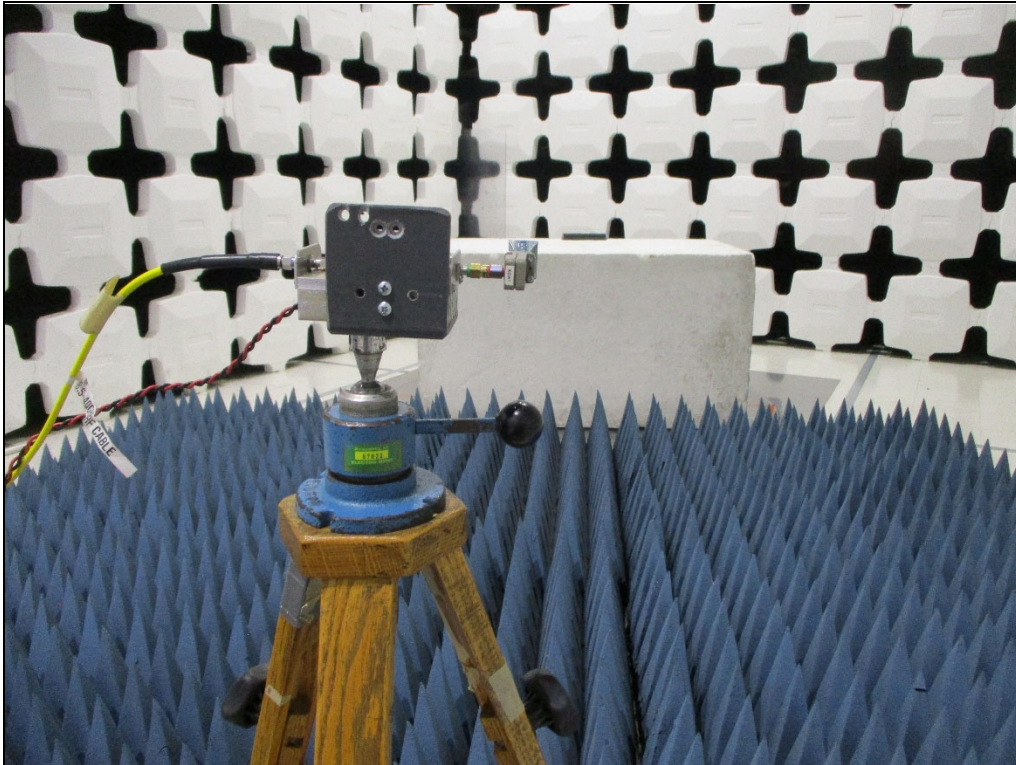
Test Setup for Radiated Emissions: 1GHz to 18GHz, Vertical Polarization



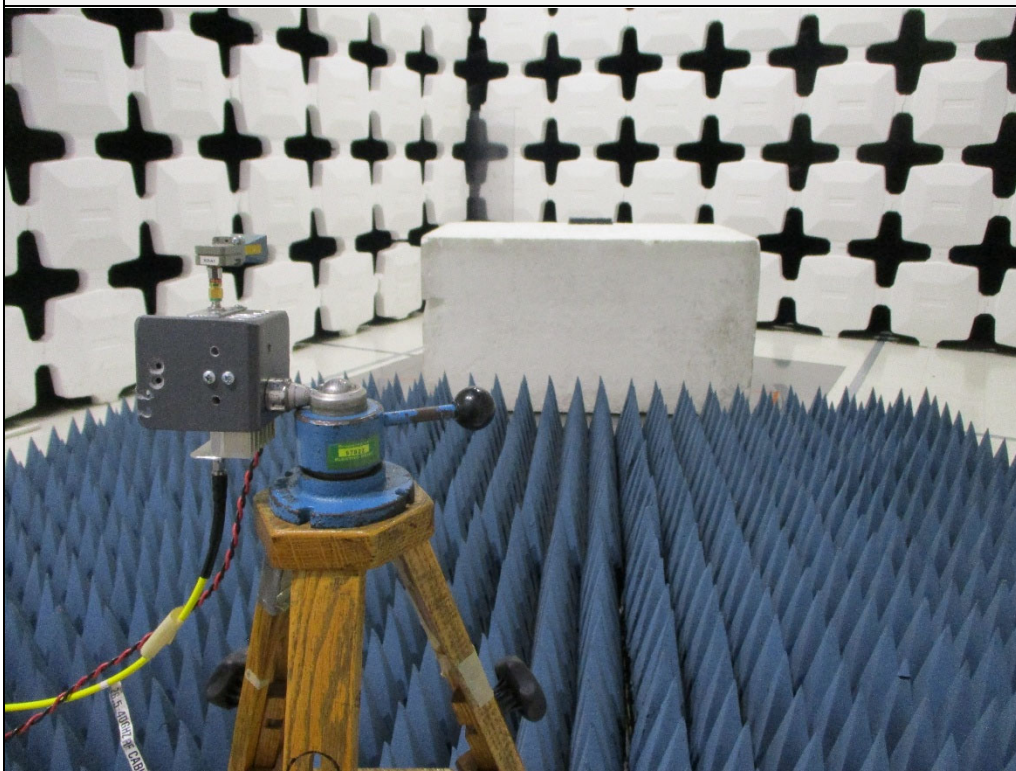
Test Setup for Radiated Emissions: 18GHz to 26.5GHz, Horizontal Polarization



Test Setup for Radiated Emissions: 18GHz to 26.5GHz, Vertical Polarization



Test Setup for Radiated Emissions: 26.5GHz to 30GHz, Horizontal Polarization



Test Setup for Radiated Emissions: 26.5GHz to 30GHz, Vertical Polarization

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 120 kHz
 Prelim Dwell Time (s) : 0.0001
 Notes :
 Test Engineer : T. Jozefczyk
 Test Date : Aug 18, 2026 – 12:08:35 PM

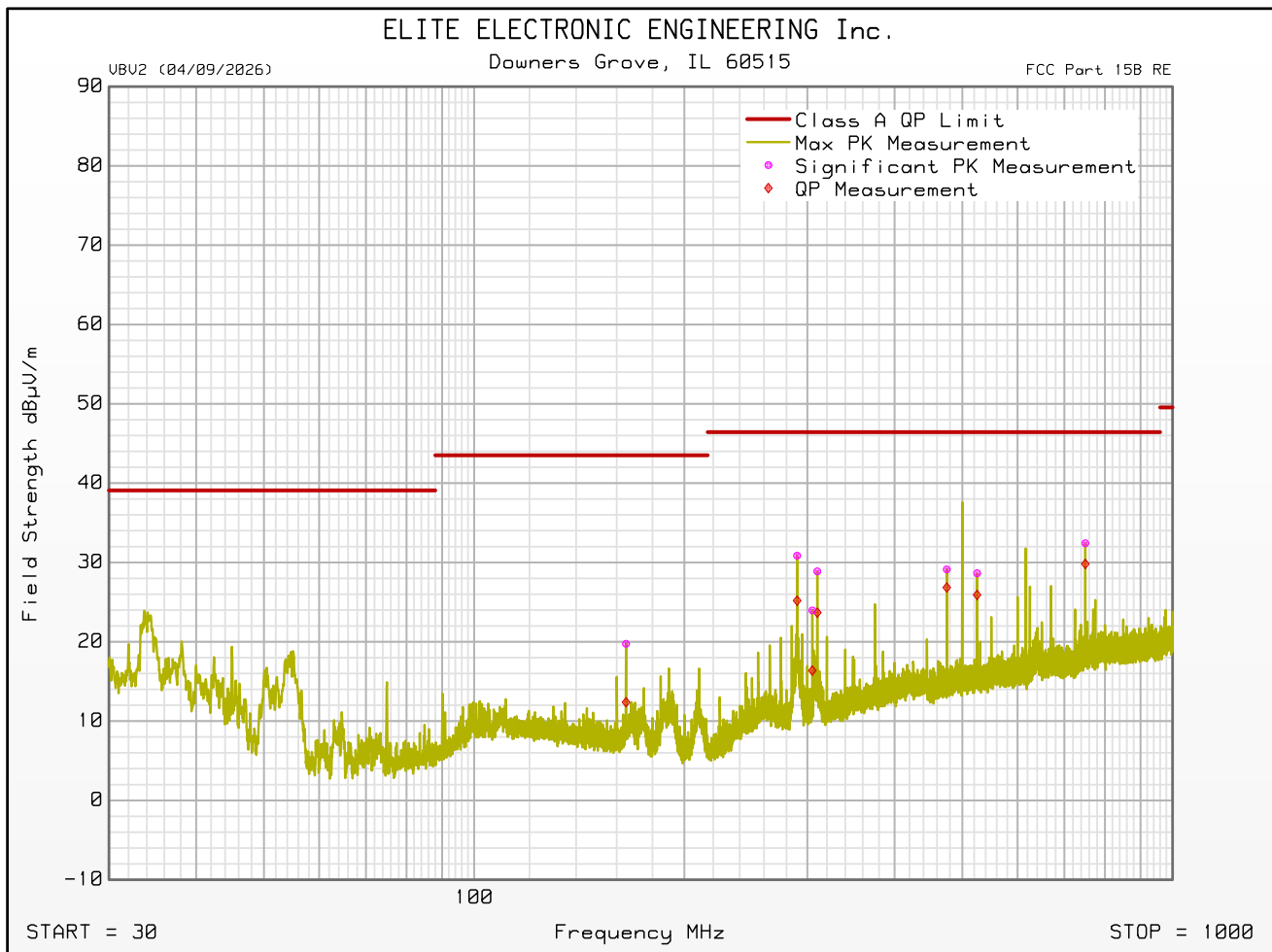
Frequency	Peak Mtr Rdg dBμV	QP Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	QP Total dBμV/m	QP Limit dBμV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive QP Level
34.53 MHz	29.3	19.9	21.7	0.0	0.4	-10.5	40.9	31.5	39.1	-7.5	Vertical	200	112.5	
40.08 MHz	28.6	14.1	18.7	0.0	0.4	-10.5	37.2	22.7	39.1	-16.4	Vertical	120	202.5	
50.28 MHz	35.0	24.7	14.0	0.0	0.4	-10.5	39.0	28.6	39.1	-10.4	Vertical	120	135	
53.97 MHz	33.9	25.6	12.9	0.0	0.4	-10.5	36.8	28.5	39.1	-10.6	Vertical	120	315	
64.98 MHz	33.3	26.8	12.2	0.0	0.5	-10.5	35.5	29.0	39.1	-10.1	Vertical	200	292.5	
75 MHz	33.1	25.9	12.6	0.0	0.5	-10.5	35.8	28.5	39.1	-10.5	Vertical	200	157.5	
101.89 MHz	17.3	13.0	17.0	0.0	0.6	-10.5	24.4	20.1	43.5	-23.4	Vertical	120	157.5	
135.01 MHz	15.6	8.4	17.7	0.0	0.7	-10.5	23.5	16.3	43.5	-27.2	Vertical	200	90	
164.98 MHz	13.4	6.0	16.0	0.0	0.8	-10.5	19.7	12.4	43.5	-31.1	Horizontal	340	202.5	
290.01 MHz	21.3	15.6	19.0	0.0	1.0	-10.5	30.9	25.2	46.4	-21.3	Horizontal	200	247.5	
305.01 MHz	14.1	6.5	19.3	0.0	1.1	-10.5	23.9	16.4	46.4	-30.1	Horizontal	120	180	
310.02 MHz	18.9	13.7	19.4	0.0	1.1	-10.5	28.9	23.7	46.4	-22.8	Horizontal	200	180	
474.99 MHz	14.9	12.7	23.3	0.0	1.3	-10.5	29.1	26.8	46.4	-19.6	Horizontal	200	22.5	
499.98 MHz	25.1	24.1	23.5	0.0	1.3	-10.5	39.5	38.5	46.4	-7.9	Vertical	200	180	
525 MHz	14.1	11.3	23.7	0.0	1.4	-10.5	28.6	25.9	46.4	-20.5	Horizontal	200	202.5	
615.99 MHz	16.9	10.6	24.7	0.0	1.5	-10.5	32.7	26.4	46.4	-20.1	Vertical	340	225	
750 MHz	15.4	12.8	25.9	0.0	1.6	-10.5	32.4	29.8	46.4	-16.6	Horizontal	120	225	
774.99 MHz	12.3	8.3	25.9	0.0	1.7	-10.5	29.5	25.4	46.4	-21.0	Vertical	120	157.5	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Horizontal
 Scan Type : FFT / Time Domain Scan
 Test RBW : 120 kHz
 Prelim Dwell Time (s) : 0.0001
 Notes :
 Test Engineer : T. Jozefczyk
 Test Date : Aug 18, 2026 – 12:08:35 PM

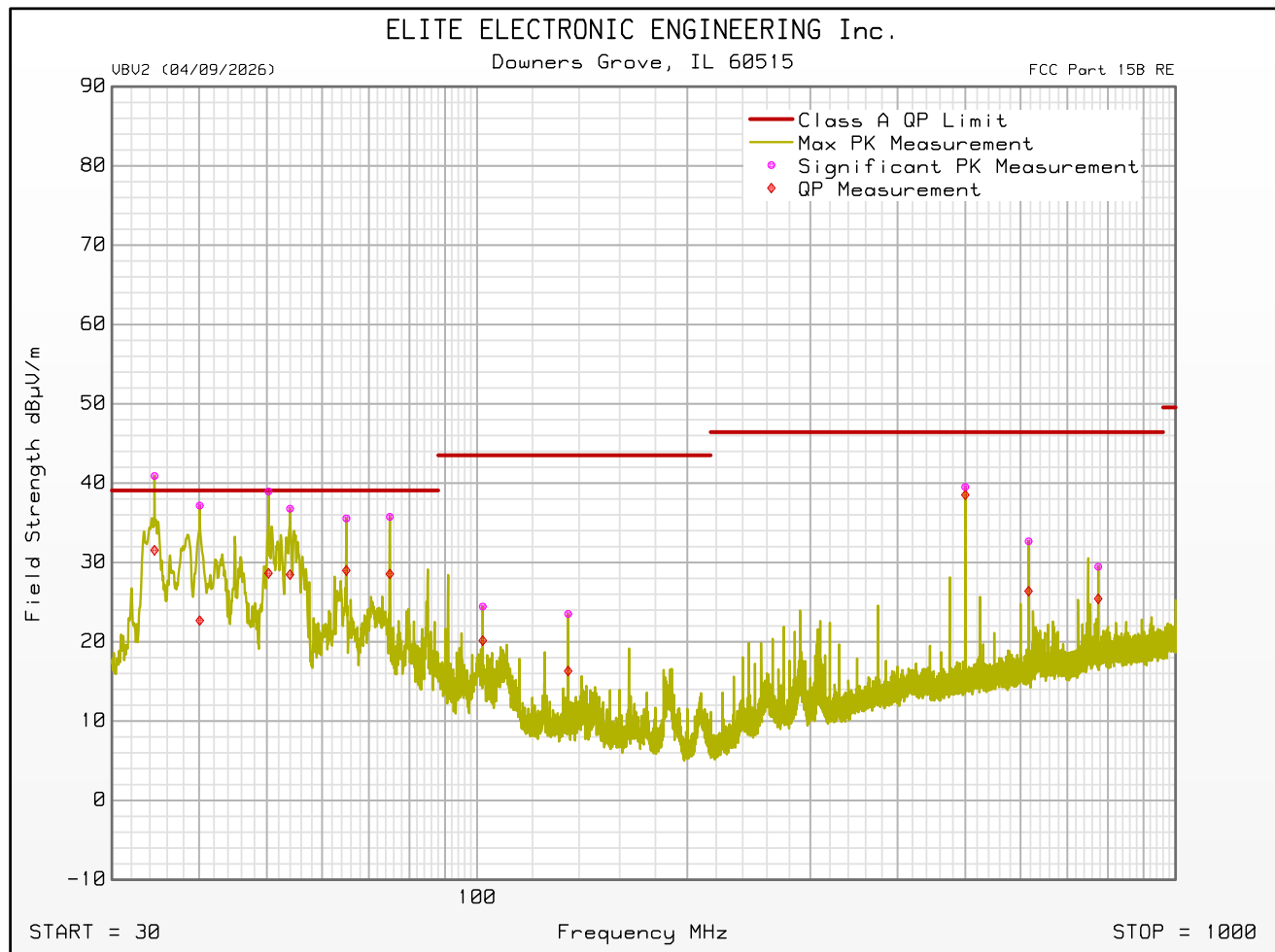


FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Vertical
 Scan Type : FFT / Time Domain Scan
 Test RBW : 120 kHz
 Prelim Dwell Time (s) : 0.0001
 Notes :
 Test Engineer : T. Jozefczyk
 Test Date : Aug 18, 2026 – 12:08:35 PM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 10:31:42 AM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
1.017 GHz	52.3	28.2	-41.5	1.9	-10.5	30.4	69.5	-39.1	Horizontal	340	45	
1.283 GHz	51.2	29.4	-41.2	2.1	-10.5	31	69.5	-38.5	Horizontal	200	202.5	
1.864 GHz	64.3	31.4	-41.2	2.6	-10.5	46.6	69.5	-22.9	Horizontal	200	90	
2.424 GHz	60.1	32.3	-40.9	3.0	-10.5	44	69.5	-25.5	Vertical	200	270	
2.48 GHz	61	32.4	-40.9	3.0	-10.5	45	69.5	-24.5	Horizontal	120	135	
4.238 GHz	48.6	33.7	-40.5	3.9	-10.5	35.2	69.5	-34.3	Vertical	120	112.5	
6.729 GHz	48.7	35.7	-40.8	4.9	-10.5	38	69.5	-31.5	Horizontal	120	315	
10.537 GHz	48.6	37.7	-40.4	6.3	-10.5	41.7	69.5	-27.8	Vertical	200	315	
17.024 GHz	47.4	42.8	-38.7	8.3	-10.5	49.3	69.5	-20.2	Vertical	200	202.5	
17.292 GHz	47.6	42.5	-38.6	8.4	-10.5	49.4	69.5	-20.1	Horizontal	340	202.5	

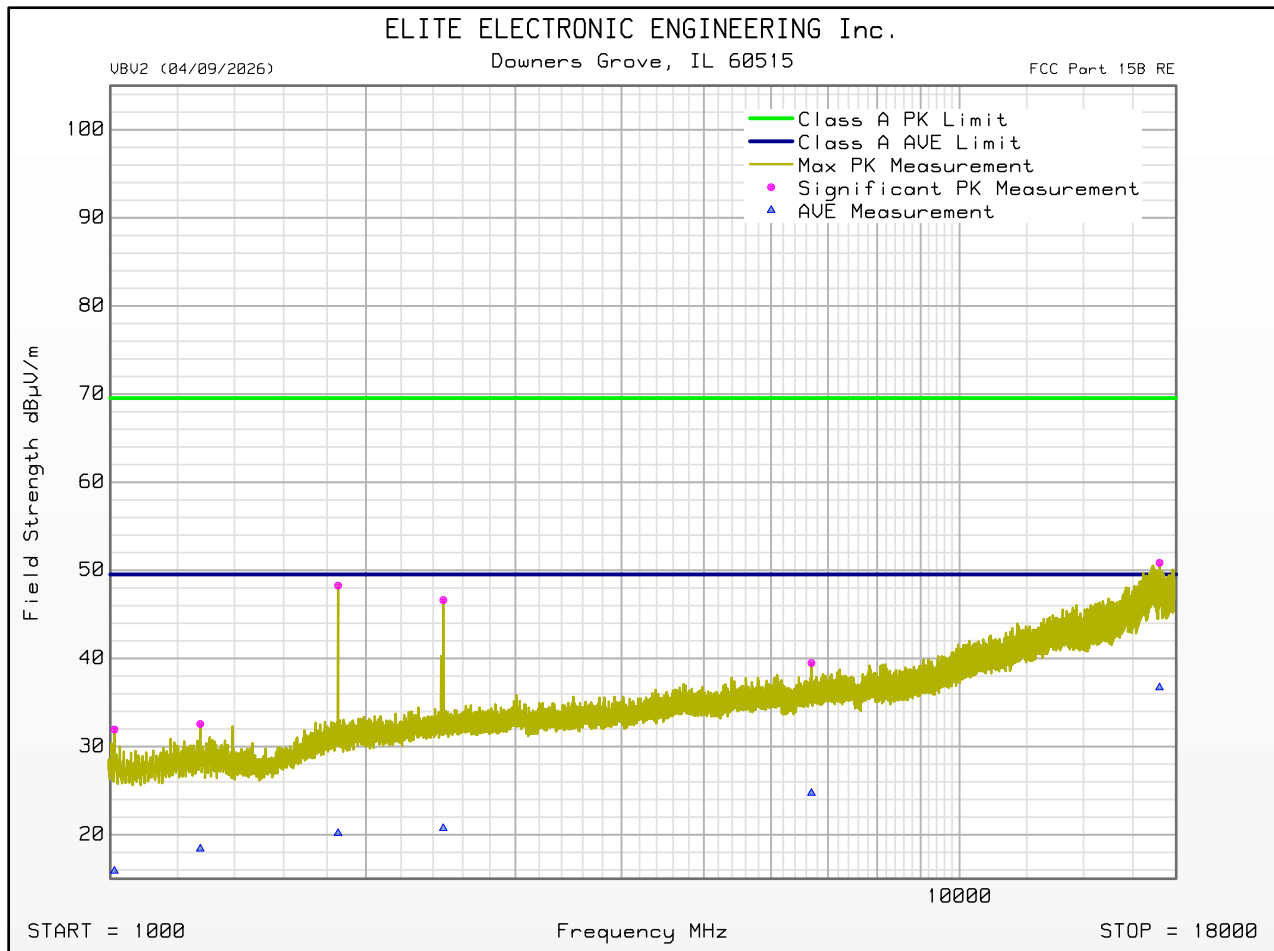
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
1.017 GHz	36.2	28.2	-41.5	1.9	-10.5	14.3	49.5	-35.2	Horizontal	340	45	
1.283 GHz	37.1	29.4	-41.2	2.1	-10.5	16.9	49.5	-32.6	Horizontal	200	202.5	
1.864 GHz	36.2	31.4	-41.2	2.6	-10.5	18.5	49.5	-31.0	Horizontal	200	90	
2.424 GHz	35.3	32.3	-40.9	3.0	-10.5	19.2	49.5	-30.3	Vertical	200	270	
2.48 GHz	35.1	32.4	-40.9	3.0	-10.5	19.1	49.5	-30.4	Horizontal	120	135	
4.238 GHz	34.6	33.7	-40.5	3.9	-10.5	21.2	49.5	-28.3	Vertical	120	112.5	
6.729 GHz	33.9	35.7	-40.8	4.9	-10.5	23.2	49.5	-26.3	Horizontal	120	315	
10.537 GHz	34.0	37.7	-40.4	6.3	-10.5	27.1	49.5	-22.4	Vertical	200	315	
17.024 GHz	33.1	42.8	-38.7	8.3	-10.5	35.0	49.5	-14.5	Vertical	200	202.5	
17.292 GHz	33.4	42.5	-38.6	8.4	-10.5	35.2	49.5	-14.3	Horizontal	340	202.5	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Horizontal
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 10:31:42 AM

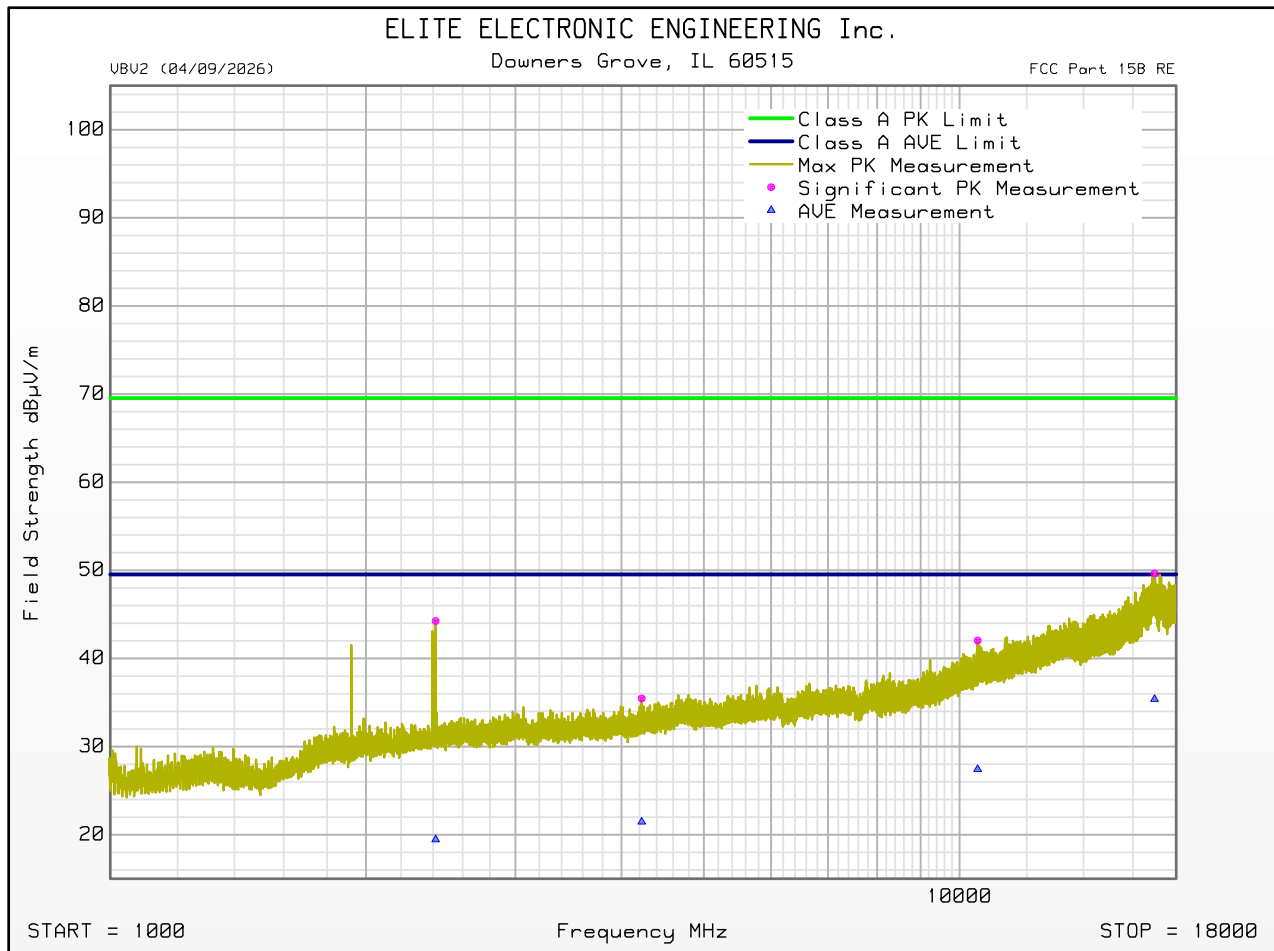


FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Vertical
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 10:31:42 AM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (18-25.5GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:52:26 AM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
18.171 GHz	41.1	40.3	-32.6	2.2	-10.5	40.5	69.5	-29.0	Horizontal	100	0	
18.708 GHz	40.9	40.3	-32.1	2.2	-10.5	40.8	69.5	-28.7	Horizontal	100	0	
19.004 GHz	40.0	40.4	-31.7	2.2	-10.5	40.4	69.5	-29.1	Horizontal	100	0	
19.959 GHz	39.9	40.4	-30.8	2.2	-10.5	41.2	69.5	-28.3	Horizontal	100	0	
20.207 GHz	39.2	40.3	-30.5	2.3	-10.5	40.8	69.5	-28.7	Horizontal	100	0	
20.388 GHz	38.9	40.2	-30.0	2.3	-10.5	40.9	69.5	-28.6	Horizontal	100	0	
20.909 GHz	39.1	40.0	-29.8	2.3	-10.5	41.1	69.5	-28.4	Horizontal	100	0	
21.001 GHz	39.1	40.0	-29.8	2.3	-10.5	41.1	69.5	-28.4	Horizontal	100	0	
21.681 GHz	40.2	40.6	-30.1	2.2	-10.5	42.4	69.5	-27.1	Horizontal	100	0	
21.965 GHz	41.1	40.6	-30.0	2.2	-10.5	43.4	69.5	-26.1	Horizontal	100	0	
22.053 GHz	41.1	40.6	-30.1	2.2	-10.5	43.3	69.5	-26.2	Horizontal	100	0	
22.106 GHz	41	40.6	-30.3	2.2	-10.5	43	69.5	-26.5	Horizontal	100	0	
23.658 GHz	39.9	40.6	-31	2.3	-10.5	41.3	69.5	-28.2	Horizontal	100	0	
24.035 GHz	39.6	40.6	-31	2.2	-10.5	40.9	69.5	-28.6	Horizontal	100	0	
24.759 GHz	41.2	40.6	-30.8	2.2	-10.5	42.7	69.5	-26.8	Horizontal	100	0	
26.062 GHz	42.5	40.7	-31	2.2	-10.5	43.9	69.5	-25.6	Horizontal	100	0	
26.311 GHz	43.3	40.7	-31.2	2.3	-10.5	44.6	69.5	-24.9	Horizontal	100	0	
26.486 GHz	42.8	40.7	-31.7	2.3	-10.5	43.6	69.5	-25.9	Horizontal	100	0	

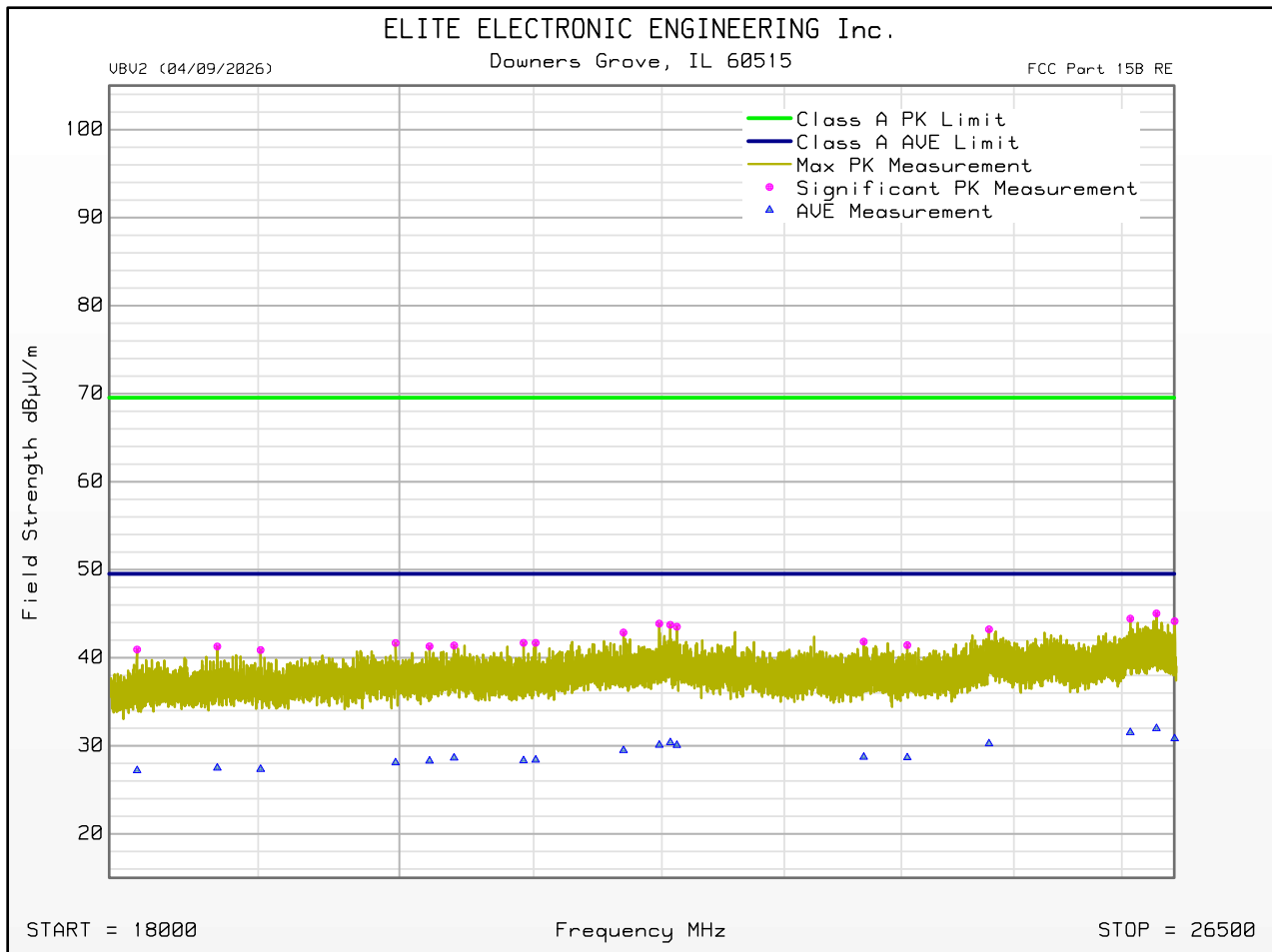
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
18.171 GHz	27.3	40.3	-32.6	2.2	-10.5	26.7	49.5	-22.8	Horizontal	100	0	
18.708 GHz	27.1	40.3	-32.1	2.2	-10.5	27.0	49.5	-22.5	Horizontal	100	0	
19.004 GHz	26.5	40.4	-31.7	2.2	-10.5	26.9	49.5	-22.6	Horizontal	100	0	
19.959 GHz	26.3	40.4	-30.8	2.2	-10.5	27.6	49.5	-21.9	Horizontal	100	0	
20.207 GHz	26.2	40.3	-30.5	2.3	-10.5	27.8	49.5	-21.7	Horizontal	100	0	
20.388 GHz	26.1	40.2	-30.0	2.3	-10.5	28.1	49.5	-21.4	Horizontal	100	0	
20.909 GHz	25.8	40.0	-29.8	2.3	-10.5	27.8	49.5	-21.7	Horizontal	100	0	
21.001 GHz	25.8	40.0	-29.8	2.3	-10.5	27.8	49.5	-21.7	Horizontal	100	0	
21.681 GHz	26.8	40.6	-30.1	2.2	-10.5	29.0	49.5	-20.5	Horizontal	100	0	
21.965 GHz	27.2	40.6	-30.0	2.2	-10.5	29.5	49.5	-20.0	Horizontal	100	0	
22.053 GHz	27.7	40.6	-30.1	2.2	-10.5	29.9	49.5	-19.6	Horizontal	100	0	
22.106 GHz	27.6	40.6	-30.3	2.2	-10.5	29.6	49.5	-19.9	Horizontal	100	0	
23.658 GHz	26.8	40.6	-31.0	2.3	-10.5	28.2	49.5	-21.3	Horizontal	100	0	
24.035 GHz	26.8	40.6	-31.0	2.2	-10.5	28.1	49.5	-21.4	Horizontal	100	0	
24.759 GHz	28.2	40.6	-30.8	2.2	-10.5	29.7	49.5	-19.8	Horizontal	100	0	
26.062 GHz	29.6	40.7	-31.0	2.2	-10.5	31.0	49.5	-18.5	Horizontal	100	0	
26.311 GHz	30.2	40.7	-31.2	2.3	-10.5	31.5	49.5	-18.0	Horizontal	100	0	
26.486 GHz	29.5	40.7	-31.7	2.3	-10.5	30.3	49.5	-19.2	Horizontal	100	0	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Horizontal
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (18-25.5GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:52:26 AM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (18-25.5GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:54:20 AM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
18.493 GHz	39.9	40.3	-32.5	2.2	-10.5	39.4	69.5	-30.1	Vertical	100	0	
18.756 GHz	40.7	40.4	-32.1	2.2	-10.5	40.7	69.5	-28.8	Vertical	100	0	
19.182 GHz	39.3	40.4	-31.6	2.2	-10.5	39.8	69.5	-29.7	Vertical	100	0	
19.885 GHz	39.9	40.4	-30.9	2.2	-10.5	41.1	69.5	-28.4	Vertical	100	0	
19.99 GHz	40.1	40.4	-30.8	2.2	-10.5	41.4	69.5	-28.1	Vertical	100	0	
20.261 GHz	39.7	40.3	-30.4	2.3	-10.5	41.4	69.5	-28.1	Vertical	100	0	
20.965 GHz	39.6	40.0	-29.7	2.3	-10.5	41.7	69.5	-27.8	Vertical	100	0	
21.506 GHz	39.4	40.6	-29.8	2.3	-10.5	42.0	69.5	-27.5	Vertical	100	0	
21.734 GHz	39.9	40.6	-30.2	2.2	-10.5	42.0	69.5	-27.5	Vertical	100	0	
22.16 GHz	40.1	40.6	-30.1	2.2	-10.5	42.3	69.5	-27.2	Vertical	100	0	
22.34 GHz	40	40.6	-30.4	2.2	-10.5	41.9	69.5	-27.6	Vertical	100	0	
22.529 GHz	40.5	40.6	-30.6	2.2	-10.5	42.2	69.5	-27.3	Vertical	100	0	
24.109 GHz	40.1	40.6	-31	2.2	-10.5	41.4	69.5	-28.1	Vertical	100	0	
24.364 GHz	40.5	40.6	-31.1	2.2	-10.5	41.7	69.5	-27.8	Vertical	100	0	
24.778 GHz	41.3	40.6	-30.8	2.2	-10.5	42.8	69.5	-26.7	Vertical	100	0	
25.758 GHz	41.3	40.7	-31.1	2.2	-10.5	42.6	69.5	-26.9	Vertical	100	0	
26.082 GHz	42.9	40.7	-31.1	2.2	-10.5	44.2	69.5	-25.3	Vertical	100	0	
26.312 GHz	42.8	40.7	-31.2	2.3	-10.5	44.1	69.5	-25.4	Vertical	100	0	

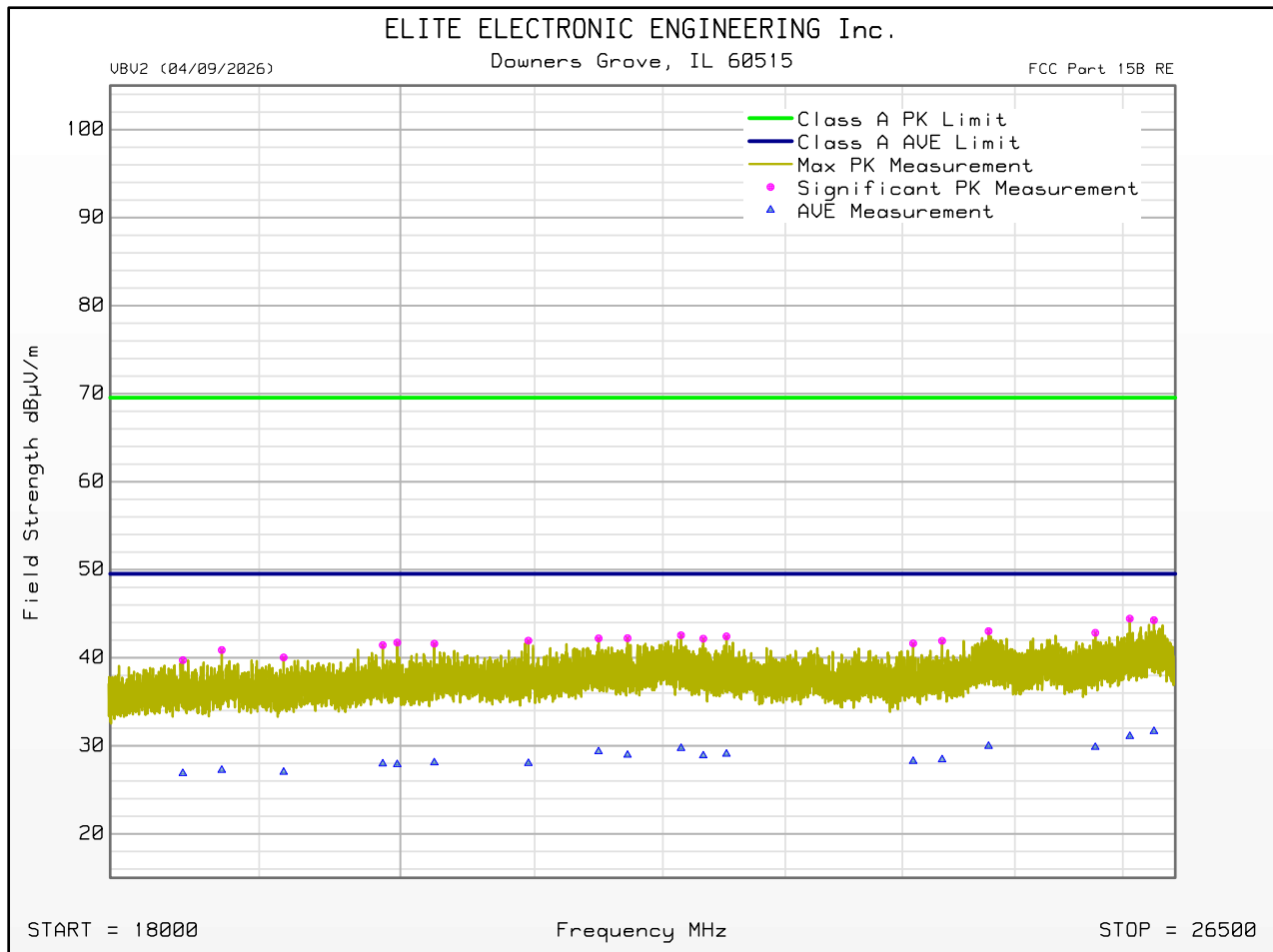
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
18.493 GHz	27.1	40.3	-32.5	2.2	-10.5	26.6	49.5	-22.9	Vertical	100	0	
18.756 GHz	27.0	40.4	-32.1	2.2	-10.5	27.0	49.5	-22.5	Vertical	100	0	
19.182 GHz	26.3	40.4	-31.6	2.2	-10.5	26.8	49.5	-22.7	Vertical	100	0	
19.885 GHz	26.5	40.4	-30.9	2.2	-10.5	27.7	49.5	-21.8	Vertical	100	0	
19.99 GHz	26.2	40.4	-30.8	2.2	-10.5	27.5	49.5	-22.0	Vertical	100	0	
20.261 GHz	26.1	40.3	-30.4	2.3	-10.5	27.8	49.5	-21.7	Vertical	100	0	
20.965 GHz	25.7	40.0	-29.7	2.3	-10.5	27.8	49.5	-21.7	Vertical	100	0	
21.506 GHz	26.6	40.6	-29.8	2.3	-10.5	29.2	49.5	-20.3	Vertical	100	0	
21.734 GHz	26.6	40.6	-30.2	2.2	-10.5	28.7	49.5	-20.8	Vertical	100	0	
22.16 GHz	27.3	40.6	-30.1	2.2	-10.5	29.5	49.5	-20.0	Vertical	100	0	
22.34 GHz	26.7	40.6	-30.4	2.2	-10.5	28.6	49.5	-20.9	Vertical	100	0	
22.529 GHz	27.1	40.6	-30.6	2.2	-10.5	28.8	49.5	-20.7	Vertical	100	0	
24.109 GHz	26.7	40.6	-31.0	2.2	-10.5	28.0	49.5	-21.5	Vertical	100	0	
24.364 GHz	27.0	40.6	-31.1	2.2	-10.5	28.2	49.5	-21.3	Vertical	100	0	
24.778 GHz	28.2	40.6	-30.8	2.2	-10.5	29.7	49.5	-19.8	Vertical	100	0	
25.758 GHz	28.3	40.7	-31.1	2.2	-10.5	29.6	49.5	-19.9	Vertical	100	0	
26.082 GHz	29.5	40.7	-31.1	2.2	-10.5	30.8	49.5	-18.7	Vertical	100	0	
26.312 GHz	30.2	40.7	-31.2	2.3	-10.5	31.5	49.5	-18.0	Vertical	100	0	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Vertical
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (18-25.5GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:54:20 AM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (26.5-40GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 12:39:48 PM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
26.766 GHz	44.0	43.7	-36.2	2.0	-10.5	43.0	69.5	-26.5	Horizontal	100	0	
26.864 GHz	44.4	43.7	-36.0	2.0	-10.5	43.6	69.5	-25.9	Horizontal	100	0	
26.94 GHz	44.3	43.7	-36.0	2.0	-10.5	43.5	69.5	-26.0	Horizontal	100	0	
27.281 GHz	43.9	43.7	-35.9	2.1	-10.5	43.3	69.5	-26.2	Horizontal	100	0	
27.409 GHz	44.6	43.7	-35.8	2.1	-10.5	44.1	69.5	-25.4	Horizontal	100	0	
27.56 GHz	43.5	43.8	-35.9	2.1	-10.5	43.0	69.5	-26.5	Horizontal	100	0	
27.653 GHz	43.7	43.8	-35.9	2.1	-10.5	43.2	69.5	-26.3	Horizontal	100	0	
27.756 GHz	43.6	43.8	-35.8	2.1	-10.5	43.2	69.5	-26.3	Horizontal	100	0	
27.866 GHz	44.2	43.8	-35.6	2.1	-10.5	44.0	69.5	-25.5	Horizontal	100	0	
28.317 GHz	43.6	43.8	-36.1	2.1	-10.5	42.9	69.5	-26.6	Horizontal	100	0	
28.341 GHz	43.1	43.8	-36.2	2.1	-10.5	42.3	69.5	-27.2	Horizontal	100	0	
28.69 GHz	44.1	43.8	-36	2.1	-10.5	43.5	69.5	-26	Horizontal	100	0	
28.809 GHz	43.6	43.8	-36.1	2.1	-10.5	42.9	69.5	-26.6	Horizontal	100	0	
29.054 GHz	43	43.8	-35.9	2.1	-10.5	42.5	69.5	-27	Horizontal	100	0	
29.182 GHz	43.4	43.8	-35.8	2.1	-10.5	43	69.5	-26.5	Horizontal	100	0	
29.438 GHz	43.1	43.8	-36	2.2	-10.5	42.6	69.5	-26.9	Horizontal	100	0	
29.505 GHz	42.9	43.8	-36.1	2.1	-10.5	42.2	69.5	-27.3	Horizontal	100	0	
29.76 GHz	43.1	43.9	-36.6	2.2	-10.5	42.1	69.5	-27.4	Horizontal	100	0	

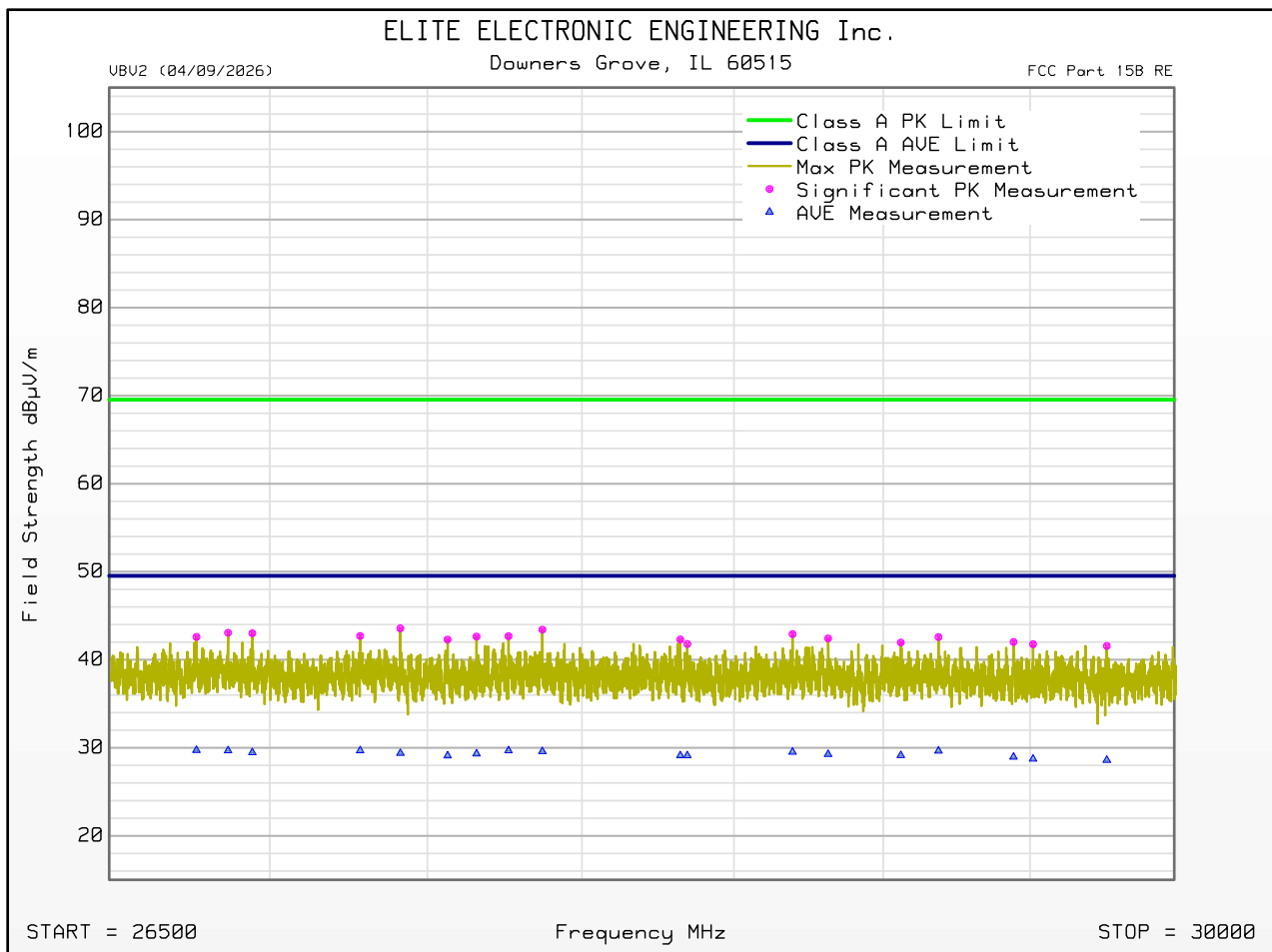
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
26.766 GHz	31.2	43.7	-36.2	2.0	-10.5	30.2	49.5	-19.3	Horizontal	100	0	
26.864 GHz	31.0	43.7	-36.0	2.0	-10.5	30.2	49.5	-19.3	Horizontal	100	0	
26.94 GHz	30.7	43.7	-36.0	2.0	-10.5	29.9	49.5	-19.6	Horizontal	100	0	
27.281 GHz	30.8	43.7	-35.9	2.1	-10.5	30.2	49.5	-19.3	Horizontal	100	0	
27.409 GHz	30.4	43.7	-35.8	2.1	-10.5	29.9	49.5	-19.6	Horizontal	100	0	
27.56 GHz	30.3	43.8	-35.9	2.1	-10.5	29.8	49.5	-19.7	Horizontal	100	0	
27.653 GHz	30.4	43.8	-35.9	2.1	-10.5	29.9	49.5	-19.6	Horizontal	100	0	
27.756 GHz	30.6	43.8	-35.8	2.1	-10.5	30.2	49.5	-19.3	Horizontal	100	0	
27.866 GHz	30.4	43.8	-35.6	2.1	-10.5	30.2	49.5	-19.3	Horizontal	100	0	
28.317 GHz	30.4	43.8	-36.1	2.1	-10.5	29.7	49.5	-19.8	Horizontal	100	0	
28.341 GHz	30.4	43.8	-36.2	2.1	-10.5	29.6	49.5	-19.9	Horizontal	100	0	
28.69 GHz	30.7	43.8	-36.0	2.1	-10.5	30.1	49.5	-19.4	Horizontal	100	0	
28.809 GHz	30.5	43.8	-36.1	2.1	-10.5	29.8	49.5	-19.7	Horizontal	100	0	
29.054 GHz	30.2	43.8	-35.9	2.1	-10.5	29.7	49.5	-19.8	Horizontal	100	0	
29.182 GHz	30.5	43.8	-35.8	2.1	-10.5	30.1	49.5	-19.4	Horizontal	100	0	
29.438 GHz	30.1	43.8	-36.0	2.2	-10.5	29.6	49.5	-19.9	Horizontal	100	0	
29.505 GHz	29.9	43.8	-36.1	2.1	-10.5	29.2	49.5	-20.3	Horizontal	100	0	
29.76 GHz	30.2	43.9	-36.6	2.2	-10.5	29.2	49.5	-20.3	Horizontal	100	0	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Horizontal
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (26.5-40GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 12:39:48 PM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (26.5-40GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 12:37:47 PM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
26.505 GHz	44.8	43.7	-36.2	2.0	-10.5	43.8	69.5	-25.7	Vertical	100	0	
26.812 GHz	44.1	43.7	-36.1	2.0	-10.5	43.2	69.5	-26.3	Vertical	100	0	
26.891 GHz	44.8	43.7	-36.0	2.0	-10.5	44.0	69.5	-25.5	Vertical	100	0	
27.332 GHz	44.1	43.7	-35.8	2.1	-10.5	43.6	69.5	-25.9	Vertical	100	0	
27.41 GHz	43.9	43.7	-35.8	2.1	-10.5	43.4	69.5	-26.1	Vertical	100	0	
27.533 GHz	43.0	43.8	-35.9	2.1	-10.5	42.5	69.5	-27.0	Vertical	100	0	
27.708 GHz	44.3	43.8	-35.8	2.1	-10.5	43.9	69.5	-25.6	Vertical	100	0	
27.787 GHz	44.1	43.8	-35.7	2.1	-10.5	43.8	69.5	-25.7	Vertical	100	0	
28.131 GHz	43.0	43.8	-35.9	2.1	-10.5	42.5	69.5	-27.0	Vertical	100	0	
28.23 GHz	43.3	43.8	-35.9	2.1	-10.5	42.8	69.5	-26.7	Vertical	100	0	
28.265 GHz	43.6	43.8	-36	2.1	-10.5	43	69.5	-26.5	Vertical	100	0	
28.437 GHz	43.8	43.8	-36.2	2.1	-10.5	43	69.5	-26.5	Vertical	100	0	
28.839 GHz	43.5	43.8	-36.2	2.1	-10.5	42.7	69.5	-26.8	Vertical	100	0	
29.18 GHz	43.3	43.8	-35.8	2.1	-10.5	42.9	69.5	-26.6	Vertical	100	0	
29.213 GHz	43.4	43.8	-35.9	2.1	-10.5	42.9	69.5	-26.6	Vertical	100	0	
29.533 GHz	44.1	43.8	-36.1	2.1	-10.5	43.4	69.5	-26.1	Vertical	100	0	
29.888 GHz	43.5	43.9	-36.6	2.2	-10.5	42.5	69.5	-27	Vertical	100	0	
29.943 GHz	43.7	43.9	-36.6	2.2	-10.5	42.7	69.5	-26.8	Vertical	100	0	

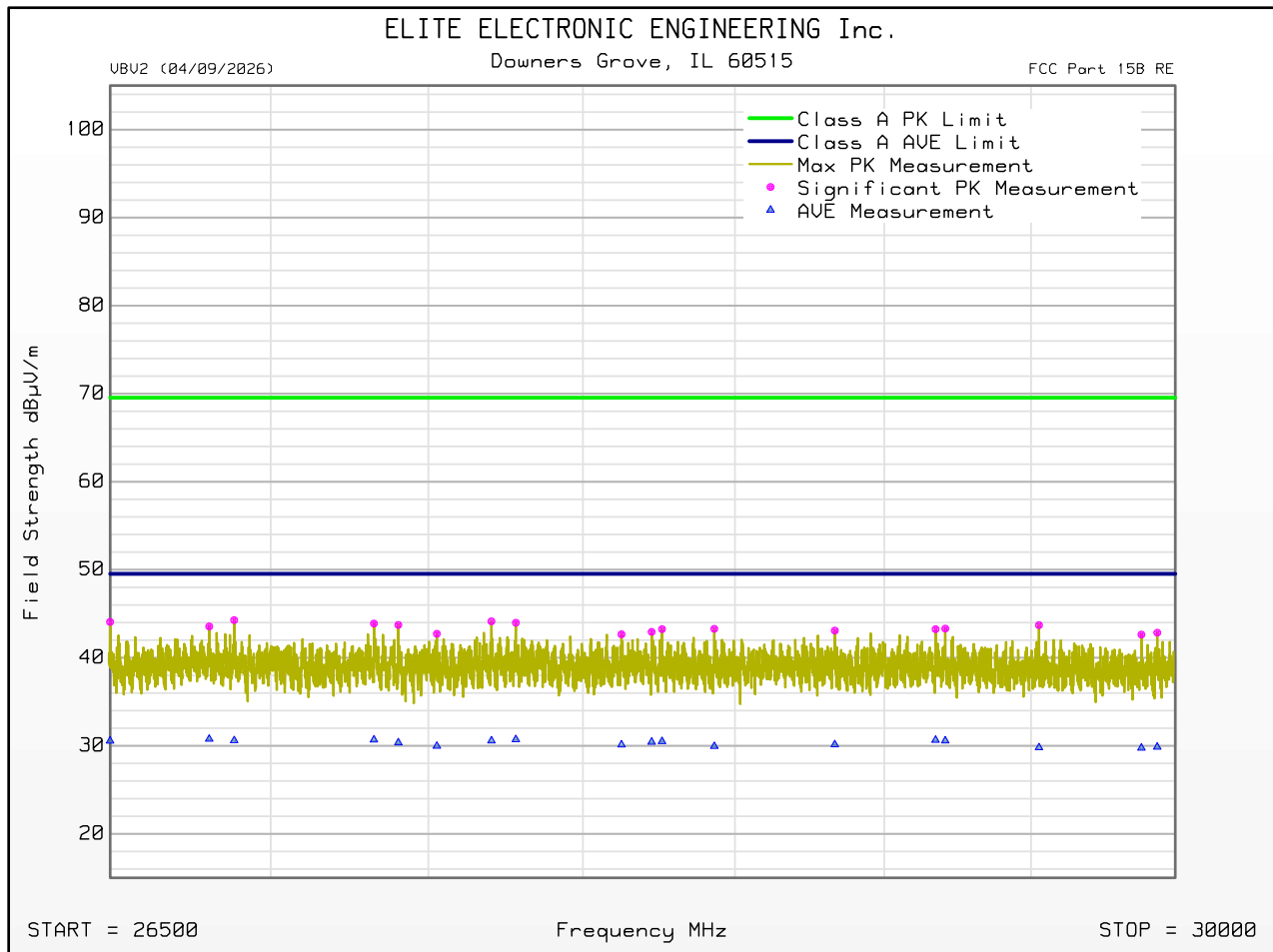
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
26.505 GHz	31.2	43.7	-36.2	2.0	-10.5	30.2	49.5	-19.3	Vertical	100	0	
26.812 GHz	31.4	43.7	-36.1	2.0	-10.5	30.5	49.5	-19.0	Vertical	100	0	
26.891 GHz	31.1	43.7	-36.0	2.0	-10.5	30.3	49.5	-19.2	Vertical	100	0	
27.332 GHz	30.9	43.7	-35.8	2.1	-10.5	30.4	49.5	-19.1	Vertical	100	0	
27.41 GHz	30.6	43.7	-35.8	2.1	-10.5	30.1	49.5	-19.4	Vertical	100	0	
27.533 GHz	30.3	43.8	-35.9	2.1	-10.5	29.8	49.5	-19.7	Vertical	100	0	
27.708 GHz	30.8	43.8	-35.8	2.1	-10.5	30.4	49.5	-19.1	Vertical	100	0	
27.787 GHz	30.8	43.8	-35.7	2.1	-10.5	30.5	49.5	-19.0	Vertical	100	0	
28.131 GHz	30.4	43.8	-35.9	2.1	-10.5	29.9	49.5	-19.6	Vertical	100	0	
28.23 GHz	30.7	43.8	-35.9	2.1	-10.5	30.2	49.5	-19.3	Vertical	100	0	
28.265 GHz	30.9	43.8	-36.0	2.1	-10.5	30.3	49.5	-19.2	Vertical	100	0	
28.437 GHz	30.4	43.8	-36.2	2.1	-10.5	29.6	49.5	-19.9	Vertical	100	0	
28.839 GHz	30.6	43.8	-36.2	2.1	-10.5	29.8	49.5	-19.7	Vertical	100	0	
29.18 GHz	30.7	43.8	-35.8	2.1	-10.5	30.3	49.5	-19.2	Vertical	100	0	
29.213 GHz	30.7	43.8	-35.9	2.1	-10.5	30.2	49.5	-19.3	Vertical	100	0	
29.533 GHz	30.2	43.8	-36.1	2.1	-10.5	29.5	49.5	-20.0	Vertical	100	0	
29.888 GHz	30.6	43.9	-36.6	2.2	-10.5	29.6	49.5	-19.9	Vertical	100	0	
29.943 GHz	30.7	43.9	-36.6	2.2	-10.5	29.7	49.5	-19.8	Vertical	100	0	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260623016003008D (External Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Vertical
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (26.5-40GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 12:37:47 PM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 120 kHz
 Prelim Dwell Time (s) : 0.0001
 Notes :
 Test Engineer : T. Jozefczyk
 Test Date : Aug 22, 2026 – 07:41:51 AM

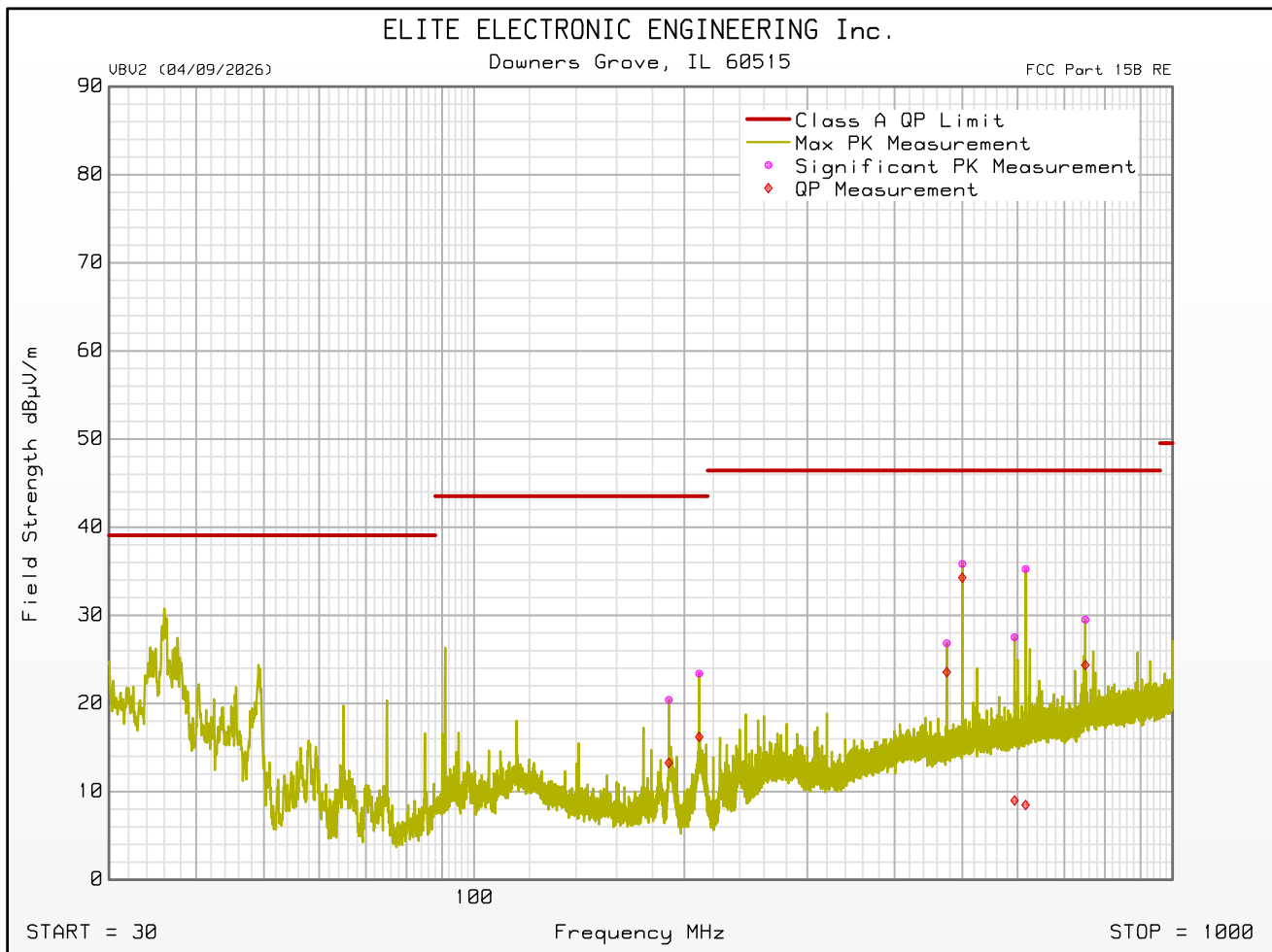
Frequency	Peak Mtr Rdg dBμV	QP Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	QP Total dBμV/m	QP Limit dBμV/m	QP Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive QP Level
34.98 MHz	22.9	14.1	21.5	0.0	0.4	-10.5	34.3	25.5	39.1	-13.6	Vertical	120	0	
45.03 MHz	26.9	19.5	16.3	0.0	0.4	-10.5	33.1	25.7	39.1	-13.4	Vertical	120	0	
49.17 MHz	31.5	21.7	14.5	0.0	0.4	-10.5	35.9	26.2	39.1	-12.9	Vertical	120	247.5	
65.01 MHz	24.6	17.5	12.2	0.0	0.5	-10.5	26.9	19.7	39.1	-19.4	Vertical	200	67.5	
75 MHz	24.8	17.9	12.6	0.0	0.5	-10.5	27.4	20.6	39.1	-18.5	Vertical	200	180	
84.99 MHz	22.5	17.1	13.9	0.0	0.6	-10.5	26.5	21.2	39.1	-17.9	Vertical	200	180	
109.99 MHz	14.1	6.3	17.8	0.0	0.6	-10.5	22.1	14.3	43.5	-29.2	Vertical	120	270	
115 MHz	18.1	9.7	18.1	0.0	0.7	-10.5	26.4	18.0	43.5	-25.6	Vertical	200	202.5	
160 MHz	12.3	7.3	16.2	0.0	0.8	-10.5	18.8	13.9	43.5	-29.7	Vertical	200	112.5	
190 MHz	15.0	7.9	15.0	0.0	0.8	-10.5	20.4	13.3	43.5	-30.3	Horizontal	340	90	
195.01 MHz	16.2	8.9	15.1	0.0	0.9	-10.5	21.6	14.4	43.5	-29.1	Vertical	200	22.5	
210.01 MHz	17.7	10.5	15.2	0.0	0.9	-10.5	23.4	16.2	43.5	-27.3	Horizontal	340	292.5	
474.99 MHz	12.6	9.4	23.3	0.0	1.3	-10.5	26.8	23.6	46.4	-22.9	Horizontal	120	157.5	
499.98 MHz	21.4	19.9	23.5	0.0	1.3	-10.5	35.8	34.3	46.4	-12.2	Horizontal	120	22.5	
525 MHz	11.6	8.1	23.7	0.0	1.4	-10.5	26.2	22.7	46.4	-23.7	Vertical	120	292.5	
593.97 MHz	11.8	-6.8	24.8	0.0	1.5	-10.5	27.5	9.0	46.4	-37.4	Horizontal	120	0	
615.99 MHz	19.5	-7.3	24.7	0.0	1.5	-10.5	35.3	8.5	46.4	-38.0	Horizontal	340	157.5	
750 MHz	12.5	7.3	25.9	0.0	1.6	-10.5	29.5	24.4	46.4	-22.1	Horizontal	340	67.5	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Horizontal
 Scan Type : FFT / Time Domain Scan
 Test RBW : 120 kHz
 Prelim Dwell Time (s) : 0.0001
 Notes :
 Test Engineer : T. Jozefczyk
 Test Date : Aug 22, 2026 – 07:41:51 AM

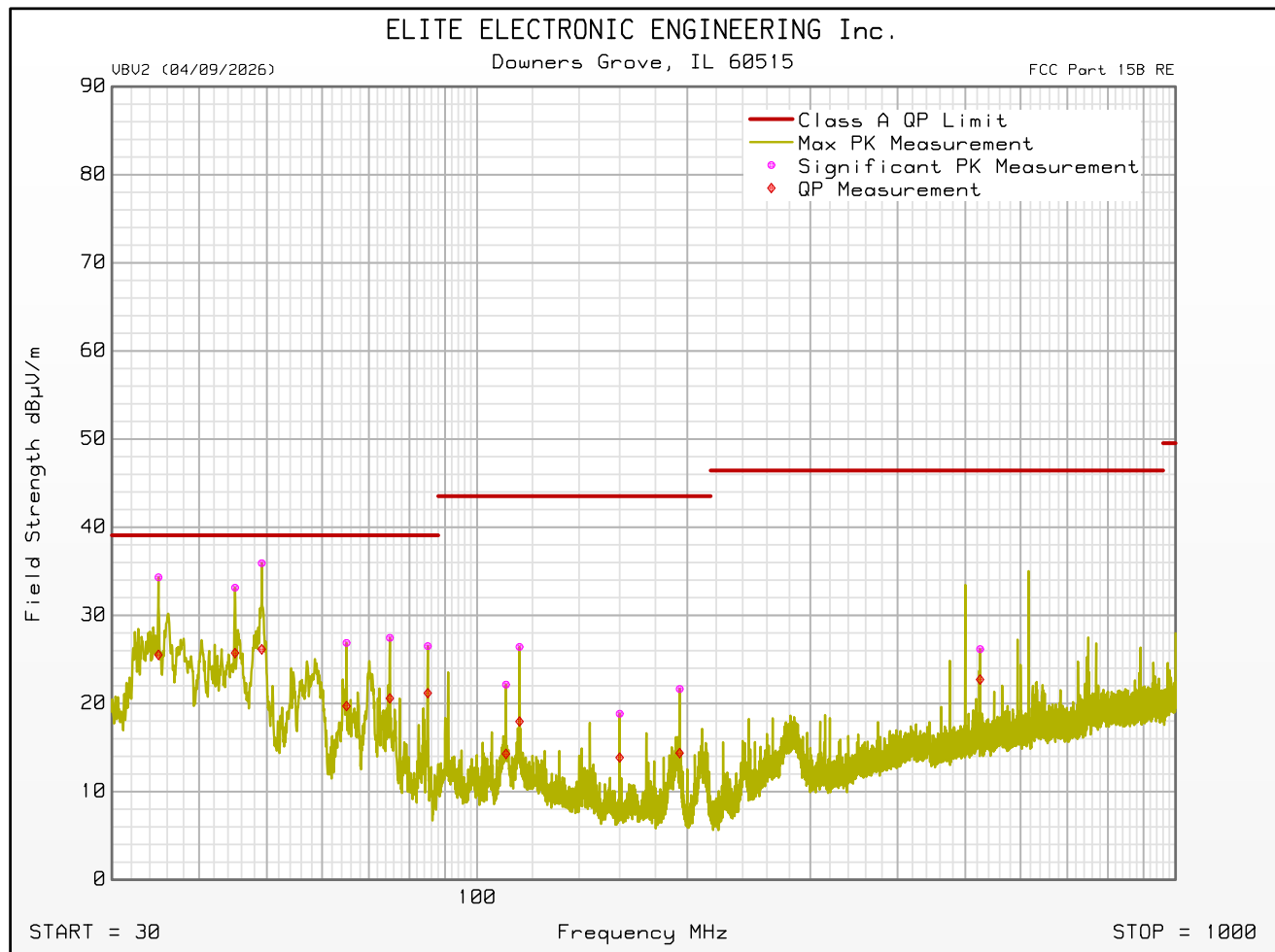


FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Vertical
 Scan Type : FFT / Time Domain Scan
 Test RBW : 120 kHz
 Prelim Dwell Time (s) : 0.0001
 Notes :
 Test Engineer : T. Jozefczyk
 Test Date : Aug 22, 2026 – 07:41:51 AM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:24:43 AM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
1.4 GHz	53.0	28.6	-41.1	2.2	-10.5	32.2	69.5	-37.3	Horizontal	120	202.5	
2.425 GHz	70.9	32.3	-40.9	3.0	-10.5	54.8	69.5	-14.7	Vertical	200	112.5	
2.53 GHz	68.9	32.5	-40.9	3.0	-10.5	53.0	69.5	-16.5	Horizontal	120	225	
2.545 GHz	71.6	32.6	-40.9	3.1	-10.5	55.9	69.5	-13.6	Horizontal	120	225	
4.109 GHz	48.1	33.7	-40.5	3.8	-10.5	34.6	69.5	-34.9	Horizontal	200	90	
5.535 GHz	48.6	34.9	-40.7	4.5	-10.5	36.8	69.5	-32.7	Horizontal	120	157.5	
10.965 GHz	47.5	38.0	-40.2	6.4	-10.5	41.2	69.5	-28.3	Horizontal	120	247.5	
17.31 GHz	47.5	42.5	-38.6	8.4	-10.5	49.3	69.5	-20.2	Vertical	340	157.5	

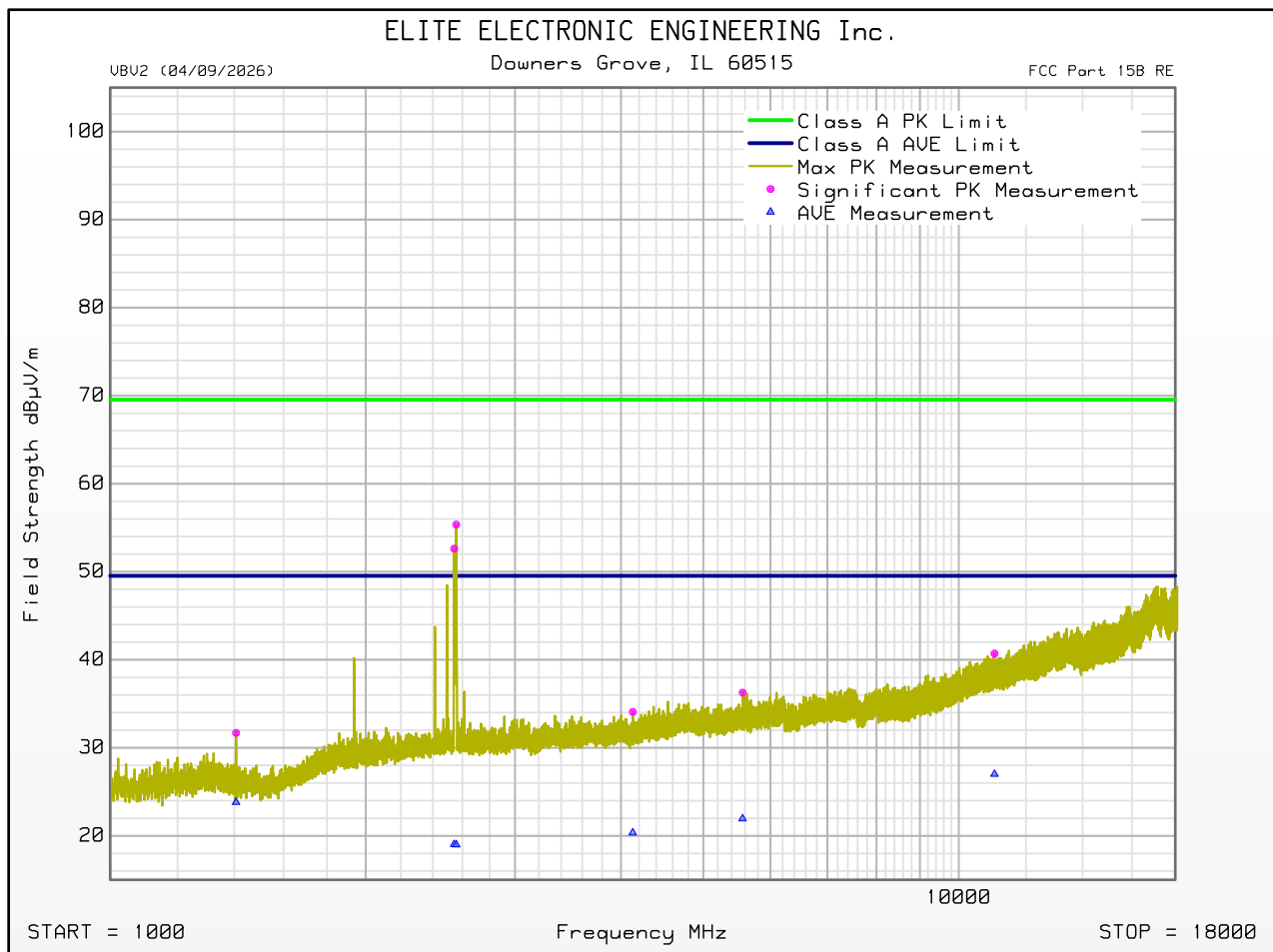
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
1.4 GHz	45.1	28.6	-41.1	2.2	-10.5	24.3	49.5	-25.2	Horizontal	120	202.5	
2.425 GHz	35.4	32.3	-40.9	3.0	-10.5	19.3	49.5	-30.2	Vertical	200	112.5	
2.53 GHz	35.3	32.5	-40.9	3.0	-10.5	19.4	49.5	-30.1	Horizontal	120	225	
2.545 GHz	35.2	32.6	-40.9	3.1	-10.5	19.5	49.5	-30.0	Horizontal	120	225	
4.109 GHz	34.3	33.7	-40.5	3.8	-10.5	20.8	49.5	-28.7	Horizontal	200	90	
5.535 GHz	34.2	34.9	-40.7	4.5	-10.5	22.4	49.5	-27.1	Horizontal	120	157.5	
10.965 GHz	33.8	38.0	-40.2	6.4	-10.5	27.5	49.5	-22.0	Horizontal	120	247.5	
17.31 GHz	33.7	42.5	-38.6	8.4	-10.5	35.5	49.5	-14.0	Vertical	340	157.5	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Horizontal
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:24:43 AM

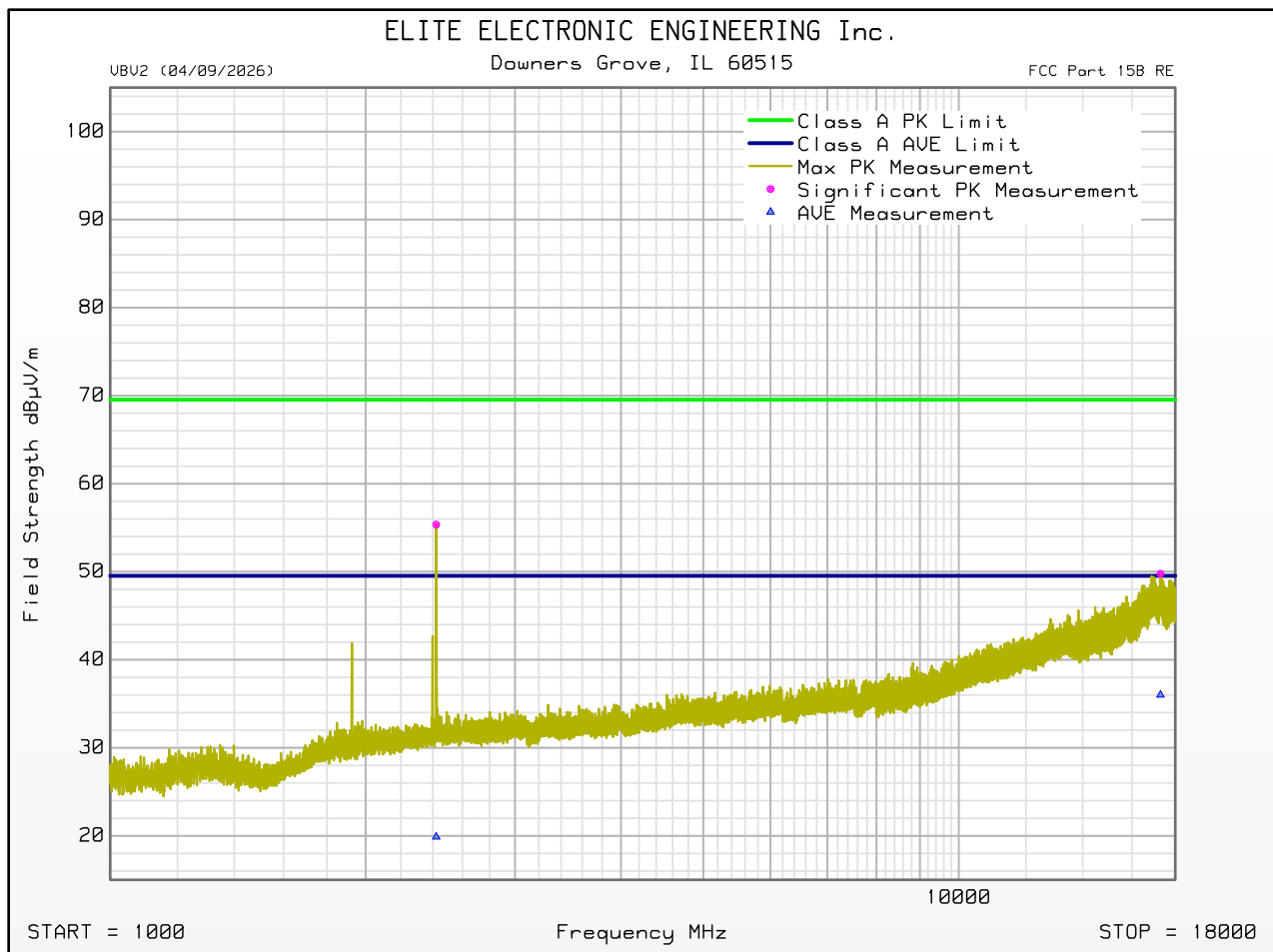


FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Vertical
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:24:43 AM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (18-25.5GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:47:29 AM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
18.479 GHz	40.4	40.3	-32.5	2.2	-10.5	39.9	69.5	-29.6	Horizontal	100	0	
18.555 GHz	40.4	40.3	-32.4	2.2	-10.5	40.0	69.5	-29.5	Horizontal	100	0	
19.179 GHz	39.8	40.4	-31.6	2.2	-10.5	40.3	69.5	-29.2	Horizontal	100	0	
19.235 GHz	40.3	40.4	-31.4	2.2	-10.5	41.0	69.5	-28.5	Horizontal	100	0	
19.964 GHz	39.5	40.4	-30.8	2.2	-10.5	40.8	69.5	-28.7	Horizontal	100	0	
20.21 GHz	40.1	40.3	-30.5	2.3	-10.5	41.7	69.5	-27.8	Horizontal	100	0	
20.686 GHz	39.9	40.1	-30.0	2.3	-10.5	41.8	69.5	-27.7	Horizontal	100	0	
21.234 GHz	39.5	40.3	-29.8	2.3	-10.5	41.8	69.5	-27.7	Horizontal	100	0	
21.581 GHz	40.3	40.6	-29.9	2.2	-10.5	42.7	69.5	-26.8	Horizontal	100	0	
22.033 GHz	41.1	40.6	-30.0	2.2	-10.5	43.4	69.5	-26.1	Horizontal	100	0	
22.438 GHz	40.4	40.6	-30.5	2.2	-10.5	42.2	69.5	-27.3	Horizontal	100	0	
23.216 GHz	40.6	40.6	-30.8	2.3	-10.5	42.2	69.5	-27.3	Horizontal	100	0	
24.467 GHz	40.2	40.6	-31.3	2.2	-10.5	41.2	69.5	-28.3	Horizontal	100	0	
24.636 GHz	41	40.6	-30.9	2.2	-10.5	42.4	69.5	-27.1	Horizontal	100	0	
24.754 GHz	41.8	40.6	-30.8	2.2	-10.5	43.3	69.5	-26.2	Horizontal	100	0	
25.309 GHz	41.7	40.7	-31	2.2	-10.5	43.1	69.5	-26.4	Horizontal	100	0	
26.071 GHz	43.3	40.7	-31	2.2	-10.5	44.7	69.5	-24.8	Horizontal	100	0	
26.306 GHz	42.9	40.7	-31.2	2.3	-10.5	44.2	69.5	-25.3	Horizontal	100	0	

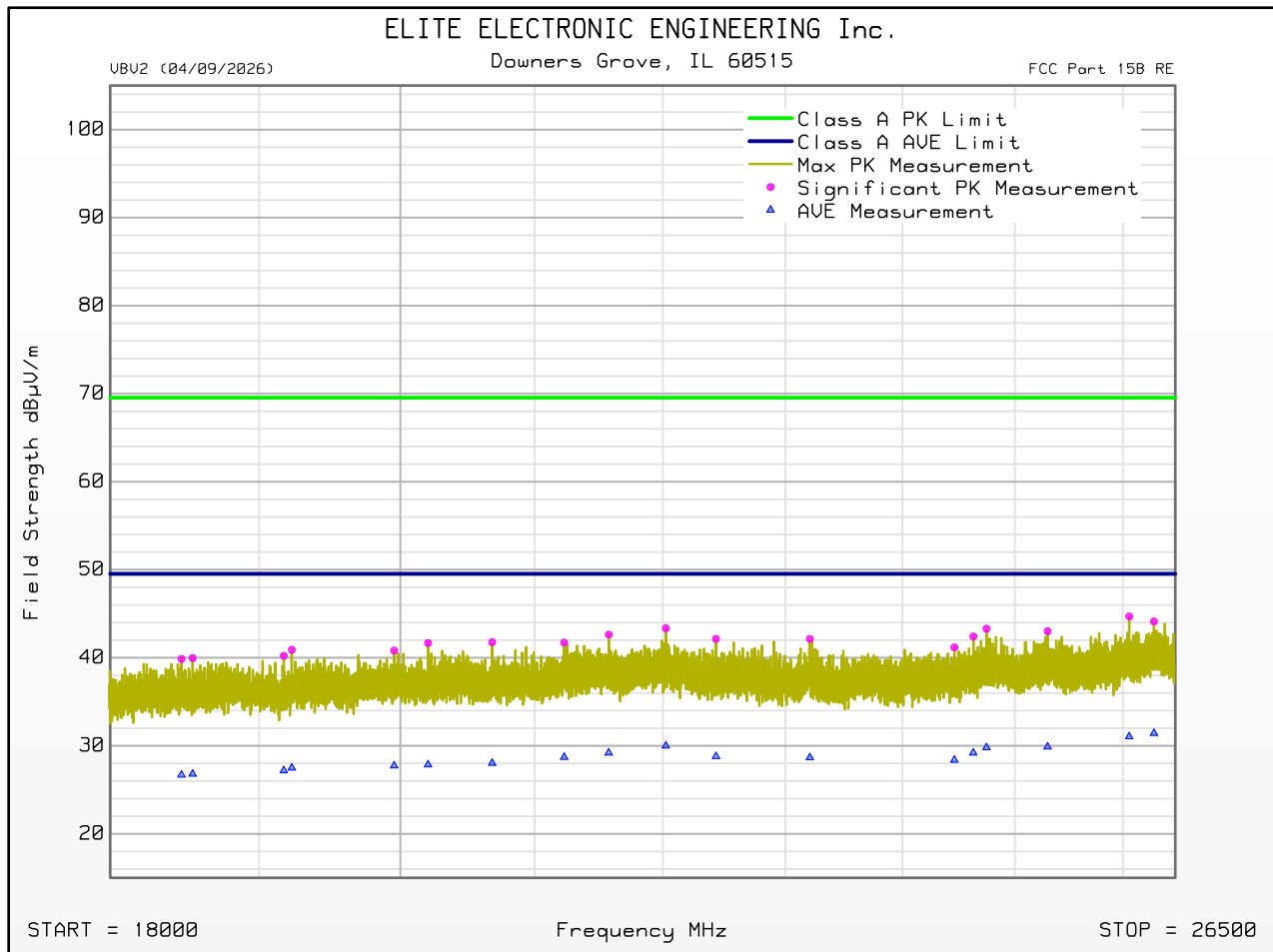
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
18.479 GHz	27.2	40.3	-32.5	2.2	-10.5	26.7	49.5	-22.8	Horizontal	100	0	
18.555 GHz	27.2	40.3	-32.4	2.2	-10.5	26.8	49.5	-22.7	Horizontal	100	0	
19.179 GHz	26.8	40.4	-31.6	2.2	-10.5	27.3	49.5	-22.2	Horizontal	100	0	
19.235 GHz	26.9	40.4	-31.4	2.2	-10.5	27.6	49.5	-21.9	Horizontal	100	0	
19.964 GHz	26.5	40.4	-30.8	2.2	-10.5	27.8	49.5	-21.7	Horizontal	100	0	
20.21 GHz	26.3	40.3	-30.5	2.3	-10.5	27.9	49.5	-21.6	Horizontal	100	0	
20.686 GHz	26.2	40.1	-30.0	2.3	-10.5	28.1	49.5	-21.4	Horizontal	100	0	
21.234 GHz	26.5	40.3	-29.8	2.3	-10.5	28.8	49.5	-20.7	Horizontal	100	0	
21.581 GHz	26.8	40.6	-29.9	2.2	-10.5	29.2	49.5	-20.3	Horizontal	100	0	
22.033 GHz	27.8	40.6	-30.0	2.2	-10.5	30.1	49.5	-19.4	Horizontal	100	0	
22.438 GHz	27.1	40.6	-30.5	2.2	-10.5	28.9	49.5	-20.6	Horizontal	100	0	
23.216 GHz	27.1	40.6	-30.8	2.3	-10.5	28.7	49.5	-20.8	Horizontal	100	0	
24.467 GHz	27.4	40.6	-31.3	2.2	-10.5	28.4	49.5	-21.1	Horizontal	100	0	
24.636 GHz	27.8	40.6	-30.9	2.2	-10.5	29.2	49.5	-20.3	Horizontal	100	0	
24.754 GHz	28.3	40.6	-30.8	2.2	-10.5	29.8	49.5	-19.7	Horizontal	100	0	
25.309 GHz	28.6	40.7	-31.0	2.2	-10.5	30.0	49.5	-19.5	Horizontal	100	0	
26.071 GHz	29.7	40.7	-31.0	2.2	-10.5	31.1	49.5	-18.4	Horizontal	100	0	
26.306 GHz	30.2	40.7	-31.2	2.3	-10.5	31.5	49.5	-18.0	Horizontal	100	0	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Horizontal
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (18-25.5GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:47:29 AM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (18-25.5GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:46:08 AM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
18.475 GHz	40.6	40.3	-32.5	2.2	-10.5	40.1	69.5	-29.4	Vertical	100	0	
18.76 GHz	41.6	40.4	-32.1	2.2	-10.5	41.6	69.5	-27.9	Vertical	100	0	
19.175 GHz	39.7	40.4	-31.6	2.2	-10.5	40.2	69.5	-29.3	Vertical	100	0	
19.605 GHz	40.2	40.4	-31.3	2.2	-10.5	41.0	69.5	-28.5	Vertical	100	0	
19.761 GHz	40.4	40.4	-30.9	2.2	-10.5	41.6	69.5	-27.9	Vertical	100	0	
20.103 GHz	39.9	40.4	-30.5	2.2	-10.5	41.5	69.5	-28.0	Vertical	100	0	
21.236 GHz	40.4	40.3	-29.8	2.3	-10.5	42.7	69.5	-26.8	Vertical	100	0	
21.286 GHz	40.2	40.3	-29.9	2.3	-10.5	42.4	69.5	-27.1	Vertical	100	0	
21.443 GHz	40.2	40.5	-29.7	2.3	-10.5	42.8	69.5	-26.7	Vertical	100	0	
22.029 GHz	41.0	40.6	-30.0	2.2	-10.5	43.3	69.5	-26.2	Vertical	100	0	
22.411 GHz	39.8	40.6	-30.5	2.2	-10.5	41.6	69.5	-27.9	Vertical	100	0	
22.988 GHz	40.3	40.6	-31.1	2.3	-10.5	41.6	69.5	-27.9	Vertical	100	0	
23.788 GHz	40.9	40.6	-31	2.2	-10.5	42.2	69.5	-27.3	Vertical	100	0	
24.459 GHz	41.7	40.6	-31.3	2.2	-10.5	42.7	69.5	-26.8	Vertical	100	0	
24.842 GHz	41.2	40.6	-31	2.2	-10.5	42.5	69.5	-27	Vertical	100	0	
25.211 GHz	41.9	40.7	-31	2.2	-10.5	43.3	69.5	-26.2	Vertical	100	0	
25.784 GHz	42.1	40.7	-31.1	2.2	-10.5	43.4	69.5	-26.1	Vertical	100	0	
26.259 GHz	43.4	40.7	-31.2	2.3	-10.5	44.7	69.5	-24.8	Vertical	100	0	

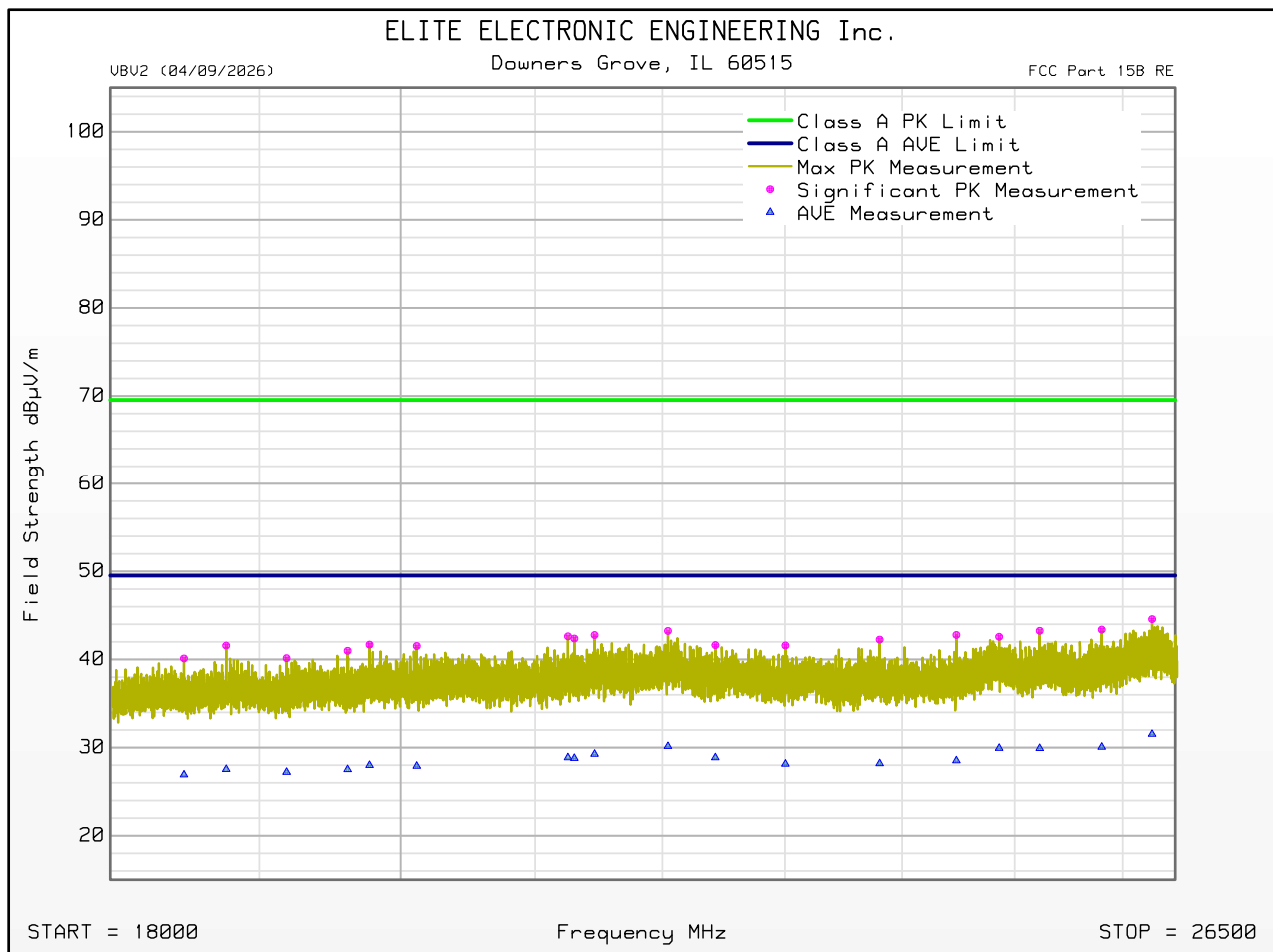
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
18.475 GHz	27.4	40.3	-32.5	2.2	-10.5	26.9	49.5	-22.6	Vertical	100	0	
18.76 GHz	27.6	40.4	-32.1	2.2	-10.5	27.6	49.5	-21.9	Vertical	100	0	
19.175 GHz	26.8	40.4	-31.6	2.2	-10.5	27.3	49.5	-22.2	Vertical	100	0	
19.605 GHz	26.7	40.4	-31.3	2.2	-10.5	27.5	49.5	-22.0	Vertical	100	0	
19.761 GHz	26.7	40.4	-30.9	2.2	-10.5	27.9	49.5	-21.6	Vertical	100	0	
20.103 GHz	26.3	40.4	-30.5	2.2	-10.5	27.9	49.5	-21.6	Vertical	100	0	
21.236 GHz	26.6	40.3	-29.8	2.3	-10.5	28.9	49.5	-20.6	Vertical	100	0	
21.286 GHz	26.6	40.3	-29.9	2.3	-10.5	28.8	49.5	-20.7	Vertical	100	0	
21.443 GHz	26.7	40.5	-29.7	2.3	-10.5	29.3	49.5	-20.2	Vertical	100	0	
22.029 GHz	27.9	40.6	-30.0	2.2	-10.5	30.2	49.5	-19.3	Vertical	100	0	
22.411 GHz	27.1	40.6	-30.5	2.2	-10.5	28.9	49.5	-20.6	Vertical	100	0	
22.988 GHz	26.8	40.6	-31.1	2.3	-10.5	28.1	49.5	-21.4	Vertical	100	0	
23.788 GHz	26.9	40.6	-31.0	2.2	-10.5	28.2	49.5	-21.3	Vertical	100	0	
24.459 GHz	27.5	40.6	-31.3	2.2	-10.5	28.5	49.5	-21.0	Vertical	100	0	
24.842 GHz	28.6	40.6	-31.0	2.2	-10.5	29.9	49.5	-19.6	Vertical	100	0	
25.211 GHz	28.5	40.7	-31.0	2.2	-10.5	29.9	49.5	-19.6	Vertical	100	0	
25.784 GHz	28.7	40.7	-31.1	2.2	-10.5	30.0	49.5	-19.5	Vertical	100	0	
26.259 GHz	30.3	40.7	-31.2	2.3	-10.5	31.6	49.5	-17.9	Vertical	100	0	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Vertical
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (18-25.5GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 11:46:08 AM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (26.5-40GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 12:41:53 PM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
26.681 GHz	43.5	43.7	-36.3	2.1	-10.5	42.5	69.5	-27.0	Horizontal	100	0	
26.768 GHz	44.0	43.7	-36.2	2.0	-10.5	43.0	69.5	-26.5	Horizontal	100	0	
26.889 GHz	44.4	43.7	-36.0	2.0	-10.5	43.6	69.5	-25.9	Horizontal	100	0	
27.235 GHz	43.6	43.7	-36.0	2.1	-10.5	42.9	69.5	-26.6	Horizontal	100	0	
27.315 GHz	44.6	43.7	-35.8	2.1	-10.5	44.1	69.5	-25.4	Horizontal	100	0	
27.556 GHz	43.8	43.8	-35.9	2.1	-10.5	43.3	69.5	-26.2	Horizontal	100	0	
27.733 GHz	43.7	43.8	-35.8	2.1	-10.5	43.3	69.5	-26.2	Horizontal	100	0	
27.76 GHz	43.9	43.8	-35.8	2.1	-10.5	43.5	69.5	-26.0	Horizontal	100	0	
27.814 GHz	43.8	43.8	-35.7	2.1	-10.5	43.5	69.5	-26.0	Horizontal	100	0	
28.235 GHz	44.2	43.8	-35.9	2.1	-10.5	43.7	69.5	-25.8	Horizontal	100	0	
28.629 GHz	43.1	43.8	-36.1	2.1	-10.5	42.4	69.5	-27.1	Horizontal	100	0	
28.686 GHz	43.6	43.8	-36	2.1	-10.5	43	69.5	-26.5	Horizontal	100	0	
28.965 GHz	43.2	43.8	-36.1	2.1	-10.5	42.5	69.5	-27	Horizontal	100	0	
29.002 GHz	43.3	43.8	-36	2.1	-10.5	42.7	69.5	-26.8	Horizontal	100	0	
29.131 GHz	43.2	43.8	-35.7	2.1	-10.5	42.9	69.5	-26.6	Horizontal	100	0	
29.436 GHz	42.9	43.8	-36	2.2	-10.5	42.4	69.5	-27.1	Horizontal	100	0	
29.683 GHz	43.1	43.9	-36.4	2.2	-10.5	42.3	69.5	-27.2	Horizontal	100	0	
29.964 GHz	44.1	43.9	-36.6	2.2	-10.5	43.1	69.5	-26.4	Horizontal	100	0	

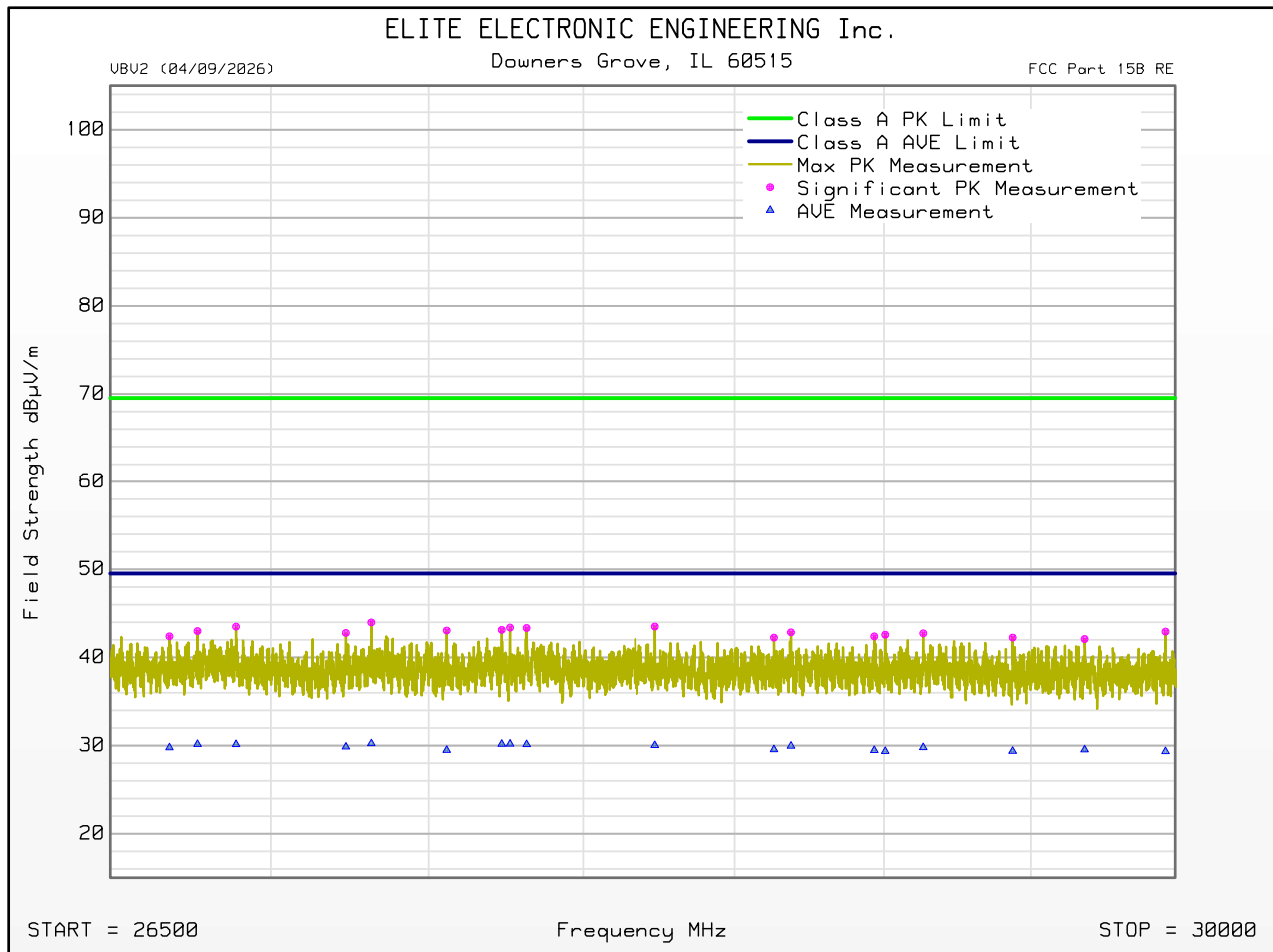
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
26.681 GHz	30.9	43.7	-36.3	2.1	-10.5	29.9	49.5	-19.6	Horizontal	100	0	
26.768 GHz	31.2	43.7	-36.2	2.0	-10.5	30.2	49.5	-19.3	Horizontal	100	0	
26.889 GHz	31.0	43.7	-36.0	2.0	-10.5	30.2	49.5	-19.3	Horizontal	100	0	
27.235 GHz	30.7	43.7	-36.0	2.1	-10.5	30.0	49.5	-19.5	Horizontal	100	0	
27.315 GHz	30.9	43.7	-35.8	2.1	-10.5	30.4	49.5	-19.1	Horizontal	100	0	
27.556 GHz	30.2	43.8	-35.9	2.1	-10.5	29.7	49.5	-19.8	Horizontal	100	0	
27.733 GHz	30.7	43.8	-35.8	2.1	-10.5	30.3	49.5	-19.2	Horizontal	100	0	
27.76 GHz	30.7	43.8	-35.8	2.1	-10.5	30.3	49.5	-19.2	Horizontal	100	0	
27.814 GHz	30.6	43.8	-35.7	2.1	-10.5	30.3	49.5	-19.2	Horizontal	100	0	
28.235 GHz	30.7	43.8	-35.9	2.1	-10.5	30.2	49.5	-19.3	Horizontal	100	0	
28.629 GHz	30.4	43.8	-36.1	2.1	-10.5	29.7	49.5	-19.8	Horizontal	100	0	
28.686 GHz	30.7	43.8	-36.0	2.1	-10.5	30.1	49.5	-19.4	Horizontal	100	0	
28.965 GHz	30.3	43.8	-36.1	2.1	-10.5	29.6	49.5	-19.9	Horizontal	100	0	
29.002 GHz	30.1	43.8	-36.0	2.1	-10.5	29.5	49.5	-20.0	Horizontal	100	0	
29.131 GHz	30.2	43.8	-35.7	2.1	-10.5	29.9	49.5	-19.6	Horizontal	100	0	
29.436 GHz	30.1	43.8	-36.0	2.2	-10.5	29.6	49.5	-19.9	Horizontal	100	0	
29.683 GHz	30.6	43.9	-36.4	2.2	-10.5	29.8	49.5	-19.7	Horizontal	100	0	
29.964 GHz	30.5	43.9	-36.6	2.2	-10.5	29.5	49.5	-20.0	Horizontal	100	0	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Horizontal
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (26.5-40GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 12:41:53 PM



FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (26.5-40GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 12:42:59 PM

Frequency	Peak Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Peak Total dBμV/m	Peak Limit dBμV/m	Peak Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Peak Level
26.535 GHz	44.6	43.7	-36.2	2.0	-10.5	43.6	69.5	-25.9	Vertical	100	0	
26.654 GHz	43.9	43.7	-36.3	2.1	-10.5	42.9	69.5	-26.6	Vertical	100	0	
26.782 GHz	44.3	43.7	-36.1	2.0	-10.5	43.4	69.5	-26.1	Vertical	100	0	
27.285 GHz	43.9	43.7	-35.9	2.1	-10.5	43.3	69.5	-26.2	Vertical	100	0	
27.435 GHz	42.9	43.7	-35.8	2.1	-10.5	42.4	69.5	-27.1	Vertical	100	0	
27.628 GHz	42.9	43.8	-35.9	2.1	-10.5	42.4	69.5	-27.1	Vertical	100	0	
27.875 GHz	43.7	43.8	-35.6	2.1	-10.5	43.5	69.5	-26.0	Vertical	100	0	
28.082 GHz	43.7	43.8	-36.0	2.1	-10.5	43.1	69.5	-26.4	Vertical	100	0	
28.332 GHz	42.9	43.8	-36.2	2.1	-10.5	42.1	69.5	-27.4	Vertical	100	0	
28.708 GHz	43.8	43.8	-36.0	2.1	-10.5	43.2	69.5	-26.3	Vertical	100	0	
28.782 GHz	43.6	43.8	-36.1	2.1	-10.5	42.9	69.5	-26.6	Vertical	100	0	
29.158 GHz	43	43.8	-35.7	2.1	-10.5	42.7	69.5	-26.8	Vertical	100	0	
29.237 GHz	43.5	43.8	-35.9	2.1	-10.5	43	69.5	-26.5	Vertical	100	0	
29.311 GHz	43.4	43.8	-36.1	2.2	-10.5	42.8	69.5	-26.7	Vertical	100	0	
29.472 GHz	43.2	43.8	-36	2.1	-10.5	42.6	69.5	-26.9	Vertical	100	0	
29.487 GHz	43	43.8	-36	2.1	-10.5	42.4	69.5	-27.1	Vertical	100	0	
29.557 GHz	42.9	43.8	-36.2	2.1	-10.5	42.1	69.5	-27.4	Vertical	100	0	

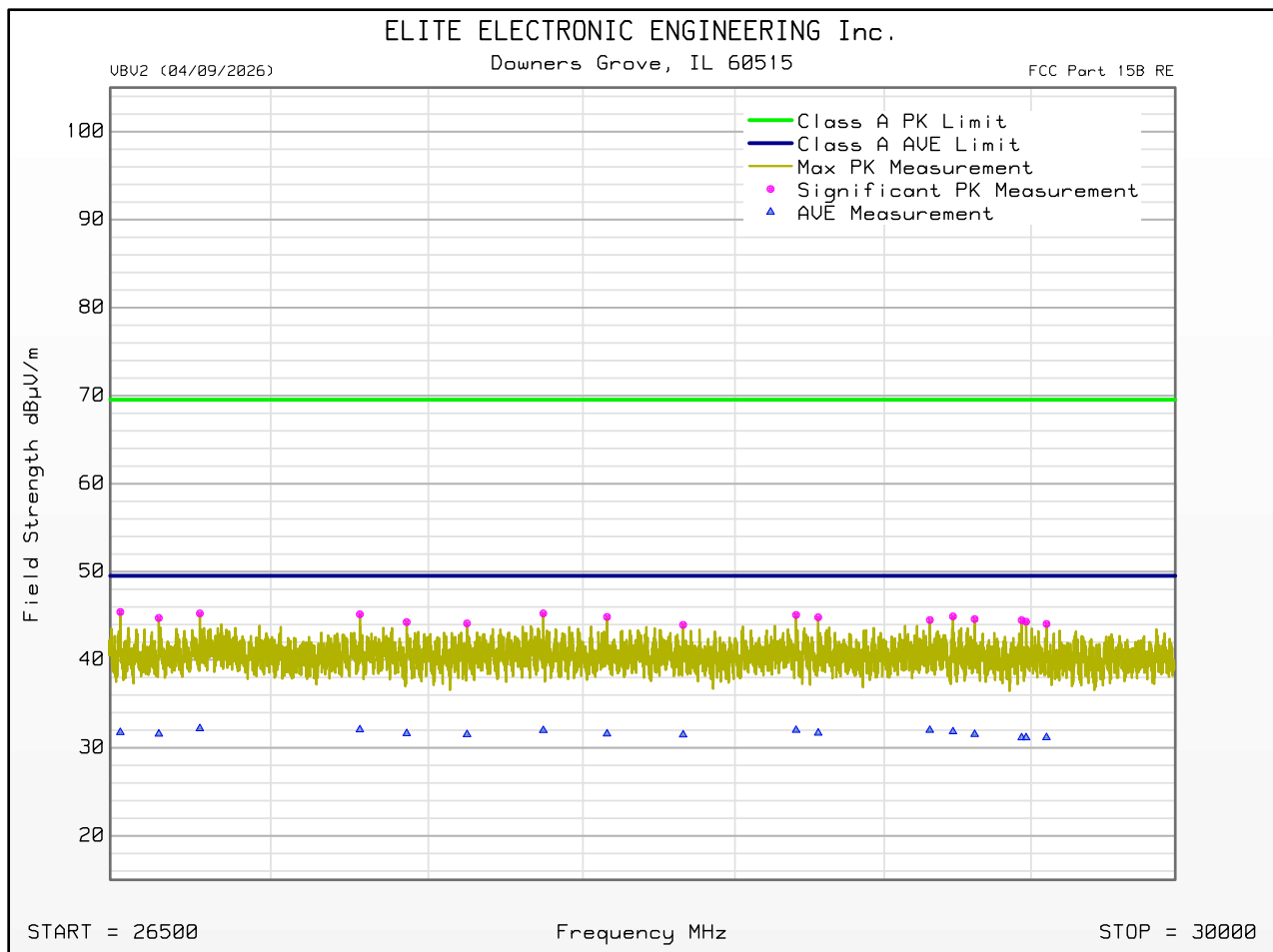
Frequency	Average Mtr Rdg dBμV	Ant Fac dB/m	Amp Fac dB	Cbl Fac dB	Dist Corr dB	Average Total dBμV/m	Average Limit dBμV/m	Average Lim Mrg dB	Ant Pol	Mast Ht cm	Angle °	Excessive Average Level
26.535 GHz	30.9	43.7	-36.2	2.0	-10.5	29.9	49.5	-19.6	Vertical	100	0	
26.654 GHz	30.8	43.7	-36.3	2.1	-10.5	29.8	49.5	-19.7	Vertical	100	0	
26.782 GHz	31.2	43.7	-36.1	2.0	-10.5	30.3	49.5	-19.2	Vertical	100	0	
27.285 GHz	30.8	43.7	-35.9	2.1	-10.5	30.2	49.5	-19.3	Vertical	100	0	
27.435 GHz	30.3	43.7	-35.8	2.1	-10.5	29.8	49.5	-19.7	Vertical	100	0	
27.628 GHz	30.3	43.8	-35.9	2.1	-10.5	29.8	49.5	-19.7	Vertical	100	0	
27.875 GHz	30.4	43.8	-35.6	2.1	-10.5	30.2	49.5	-19.3	Vertical	100	0	
28.082 GHz	30.4	43.8	-36.0	2.1	-10.5	29.8	49.5	-19.7	Vertical	100	0	
28.332 GHz	30.4	43.8	-36.2	2.1	-10.5	29.6	49.5	-19.9	Vertical	100	0	
28.708 GHz	30.7	43.8	-36.0	2.1	-10.5	30.1	49.5	-19.4	Vertical	100	0	
28.782 GHz	30.5	43.8	-36.1	2.1	-10.5	29.8	49.5	-19.7	Vertical	100	0	
29.158 GHz	30.4	43.8	-35.7	2.1	-10.5	30.1	49.5	-19.4	Vertical	100	0	
29.237 GHz	30.4	43.8	-35.9	2.1	-10.5	29.9	49.5	-19.6	Vertical	100	0	
29.311 GHz	30.3	43.8	-36.1	2.2	-10.5	29.7	49.5	-19.8	Vertical	100	0	
29.472 GHz	29.9	43.8	-36.0	2.1	-10.5	29.3	49.5	-20.2	Vertical	100	0	
29.487 GHz	29.9	43.8	-36.0	2.1	-10.5	29.3	49.5	-20.2	Vertical	100	0	
29.557 GHz	30.0	43.8	-36.2	2.1	-10.5	29.2	49.5	-20.3	Vertical	100	0	

FCC Part 15B Class A

Radiated Emissions - Scan Summary

Software Revision: VBV2 (04/09/2026)

Manufacturer : Caterpillar Inc
 Model : PL645
 Serial Number : 260619016008008D (Internal Antenna)
 Mode : Tx Standby
 Turntable Step Angle (°): 22.5
 Antenna Polarization : Vertical
 Scan Type : FFT / Time Domain Scan
 Test RBW : 1 MHz (26.5-40GHz)
 Prelim Dwell Time (s) : 0.0001
 Notes : None
 Test Engineer : J. Cardenas
 Test Date : Jul 30, 2026 – 12:42:59 PM



21. Scope of Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

ELITE ELECTRONIC ENGINEERING, INC.
1516 Centre Circle
Downers Grove, IL 60515
Robert Bugielski (QA Manager) Phone: 630 495 9770 ext. 168
Email: rbugielski@elitetest.com
Craig Fanning (EMC Lab Manager) Phone: 630 495 9770 ext. 112
Email: cfanning@elitetest.com
Brandon Lugo (Automotive Team Leader) Phone: 630 495 9770 ext. 163
Email: blugo@elitetest.com
Richard King (FCC/Commercial Team Leader) Phone: 630 495 9770 ext. 123
Email: reking@elitetest.com
Website: www.elitetest.com

ELECTRICAL

Valid To: June 30, 2027

Certificate Number: 1786.01

In recognition of the successful completion of the A2LA Accreditation Program evaluation process, accreditation is granted to this laboratory at the location listed above, as well as the satellite location listed below, to perform the following automotive electromagnetic compatibility and other electrical tests:

Test Technology:**Test Method(s)¹:**

Transient Immunity
(Max Voltage 1500 V/Max current 1000 A)

ISO 7637-2 (including emissions); ISO 7637-3; ISO 7637-4;
ISO 16750-2, Sections 4.6.3 and 4.6.4;
ISO 21498-1; ISO 21498-2;
CS.00054, Section 5.9; CS.00244 Section 5.2.15 through 5.2.21; CS.00245; CS.00246 Section 5.2.4;
EMC-CS-2009.1 (CI220); FMC1278 (CI220, CI221, CI222);
GMW 3097, Section 3.5; SAE J1113-11; SAE J1113-12;
ECE Regulation 10.06 Annex 10

Electrostatic Discharge (ESD)
(Up to +/-25 kV)

ISO 10605 (2001, 2008); ISO 10605;
CS.00054, Section 5.10; CS.00244 Section 5.5;
EMC-CS-2009.1 (CI 280); FMC1278 (CI280); SAE J1113-13;
GMW 3097 Section 3.6

Conducted Emissions

CISPR 25 (2002, 2008), Sections 6.2 and 6.3;
CISPR 25 (2016), Sections 6.3 and 6.4; CISPR 25;
CS.00054, Sections 5.6.1 and 5.6.2;
CS.00244 Sections 5.4.2 and 5.4.3; GMW 3097, Section 3.3.2;
EMC-CS-2009.1 (CE 420); FMC1278 (CE420, CE421, CE 430, CE440)

(A2LA Cert. No. 1786.01) 08/14/2025



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5202 Presidents Court, Suite 220 | Frederick, MD 21703-8398 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Test Technology:
Test Method(s)¹:

Radiated Emissions Anechoic
(Up to 6 GHz)

CISPR 25 (2002, 2008), Section 6.4;
CISPR 25 (2016), Section 6.5; CISPR 25;
CS.00054, Section 5.6.3; CS.00244 Section 5.4.4;
GMW 3097, Section 3.3.1;
EMC-CS-2009.1 (RE 310); FMC1278 (RE310, RE320)

Vehicle Radiated Emissions

CISPR 12; CISPR 36; ICES-002;
ECE Regulation 10.06 Annex 4;
ECE Regulation 10.06 Annex 5

Bulk Current Injection (BCI)
(1 to 400MHz 500mA)

ISO 11452-4; CS.00054, Section 5.8.1;
CS.00244 Section 5.3.2;
GMW 3097, Section 3.4.1; SAE J1113-4;
EMC-CS-2009.1 (RI112); FMC1278 (RI112);
ECE Regulation 10.06 Annex 9

Radiated Immunity Anechoic
(Up to 6GHz and 200V/m)
(Including Radar Pulse 600V/m)

ISO 11452-2;
CS.00054, Section 5.8.2; CS.00244 Section 5.3.3;
GMW 3097, Section 3.4.2;
EMC-CS-2009.1 (RI114); FMC1278 (RI114); SAE J1113-21;
ECE Regulation 10.06 Annex 9

Radiated Immunity Magnetic Field

ISO 11452-8; FMC 1278 (RI140); CS.00244 Section 5.3.4

Radiated Immunity Reverb
(360MHz to 6GHz and 100V/m)

ISO/IEC 61000-4-21; GMW 3097, Section 3.4.3;
EMC-CS-2009.1 (RI114); FMC1278 (RI114);
ISO 11452-11

Radiated Immunity
(Portable Transmitters)
(Up to 6GHz and 20W)

ISO 11452-9;
CS.00244 Section 5.3.5;
EMC-CS-2009.1 (RI115); FMC1278 (RI115);
GMW 3097, Sec 3.4.4

Vehicle Radiated Immunity (ALSE)

ISO 11451-2; ECE Regulation 10.06 Annex 6

Vehicle Product Specific EMC Standards

EN 14982; EN ISO 13309; ISO 13766; EN 50498;
EC Regulation No. 2015/208; EN 55012

Electrical Loads

ISO 16750-2

Stripline

ISO 11452-5

Emissions

Radiated and Conducted
(3m Semi-anechoic chamber,
up to 40 GHz)

47 CFR, FCC Part 15 B (using ANSI C63.4:2014);
47 CFR, FCC Part 18 (using FCC MP-5:1986);
ICES-001; ICES-003; ICES-005;
IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004);
IEC/CISPR 11 Ed 5 (2009-05) + A1 (2010);
KN 11 (2008-5) with RRL Notice No. 2008-3 (May 20, 2008);
CISPR 11; EN 55011; KS C 9811; CNS 13803 (1997, 2003);
CISPR 14-1; EN 55014-1; AS/NZS CISPR 14.1;