



COMPLIANCE SUMMARY REPORT

Applicant Name:

Samsung Electronics Co., Ltd.
129, Samsung-ro, Maetan dong,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Test Site/Location:

Element, Columbia, MD, USA

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SAMSUNG ELECTRONICS CO., LTD

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Compliance Summary

DUT Type:

Portable Handset

Model(s):

SM-A576U1



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1 STRATEGY FOR COMPLIANCE DEMONSTRATION

1.1 RF Exposure Evaluation Strategy

The FCC RF exposure limits are defined based on time-averaged exposure. Accordingly, for devices employing dynamic transmit power control, compliance must be demonstrated under both static transmission conditions and time-varying operational scenarios representative of normal device use.

The Device Under Test (DUT) implements the Samsung S.LSI Time-Averaged SAR (TAS) framework, which dynamically manages transmit power to ensure that time-averaged RF exposure remains within the applicable regulatory limits for all supported operating modes.

The TAS framework operates based on predefined design targets and derived power limits and is intended to maintain compliance under standalone and simultaneous transmission conditions.

Radios not controlled by the TAS framework (e.g., NFC, WPT) are evaluated independently using conventional RF exposure compliance methods.

Demonstration of RF exposure compliance for the DUT operating with the S.LSI TAS framework is completed in three parts:

0. RF Exposure Compliance Test Report Part 0: SAR Characterization

SAR Baseline RF exposure characterization is performed to establish the relationship between transmit power and RF exposure metrics for each supported radio technology, frequency band, antenna configuration, and usage scenario.

For frequencies below 6 GHz, SAR characterization data are used to define the SAR design target and derive the corresponding Plimit.

For frequencies at and above 6 GHz, power density (PD) characterization data are used to define the PD design target.

1. RF Exposure Compliance Test Report Part 1: Test in Static Transmission Condition

Part 1 demonstrates compliance with FCC RF exposure limits under static transmission conditions, where the DUT operates at the derived Plimit or PD-equivalent limits.

Standalone and simultaneous transmission scenarios are evaluated to confirm that reported exposure levels remain below the applicable limits.

2. RF Exposure Compliance Test Report Part 2: Test in Dynamic Transmission Condition

Part 2 Part 2 validates correct operation of the S.LSI TAS framework under dynamic transmission conditions, including time-varying transmit power, radio coexistence, and antenna group interaction.

This evaluation confirms that the DUT remains compliant with FCC RF exposure requirements during realistic operating scenarios.

For devices supporting combined cellular and connectivity operation, the same time-averaged exposure control principle defined in the S-TAS framework is extended to multi-radio scenarios, consistent with S.LSI combined TAS methodologies.

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1.2 Nomenclature

Term	Description
P_{max}	Maximum Tx power that can be transmitted physically from RFIC for a given RAT
$SAR_{regulatory\ limit}$	SAR value limit specified by FCC
$PD_{regulatory\ limit}$	PD value limit specified by FCC
$SAR_{design\ target}$	Target SAR level using in TAS algorithm. This SAR value should be less than above regulatory limit and should be determined after accounting for all uncertainties and other design considerations.
$PD_{design\ target}$	Target PD level using in TAS algorithm. This PD value should be less than $Spec$ and should be determined accounting for all uncertainties and other design considerations.
P_{limit}	Power level corresponds to the SAR or PD design target.

1.3 Bibliography

Report Type	Report Serial Number
RF Exposure Part 0 Test Report	1M2510280090-02.A3L
RF Exposure Part 1 Test Report	1M2510280090-01.A3L
RF Exposure Part 2 Test Report	1M2510280090-03.A3L

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2 TIME AVERAGING ALGORITHM

2.1 Algorithm Description

The S.LSI TAS framework is designed to ensure compliance with FCC RF exposure limits, which are defined in terms of time-averaged exposure.

The algorithm dynamically controls instantaneous transmit power such that the exposure averaged over the applicable regulatory time window does not exceed the corresponding design target.

For a given device configuration, RF exposure is proportional to transmit power.

Once RF exposure is characterized at a known power level, exposure at other power levels for the same configuration can be determined through linear scaling.

Based on this principle, compliance is achieved through continuous transmit power management.

The TAS framework applies consistently across all supported frequency ranges, with the applicable exposure metric determined by the operating frequency band.

2.2 Time-Averaged SAR Control (Frequencies below 6 GHz)

For frequencies below 6 GHz, RF exposure compliance is evaluated using Specific Absorption Rate (SAR). The TAS framework ensures that the time-averaged SAR over the defined SAR averaging window (TSAR) satisfies the following condition:

$$\frac{1}{T_{SAR}} \int_{t-T_{SAR}}^t SAR(\tau) d\tau \leq SAR_{design_target}$$

Equation 2-1

Where:

$SAR(\tau)$ is the instantaneous SAR corresponding to the instantaneous transmit power at time τ ,

T_{SAR} is the SAR averaging window defined by FCC requirements,

SAR_{design_target} is the predefined SAR design target derived from baseline characterization and uncertainty considerations.

Instantaneous transmit power may temporarily exceed the power corresponding to the SAR design target; however, the TAS framework ensures that the integrated SAR over any averaging window remains within the SAR design target.

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2.3 Simultaneous Transmission and Total Exposure Ratio

In simultaneous transmission scenarios involving multiple radios or antenna groups, the TAS framework evaluates RF exposure using the Total Exposure Ratio (TER) concept.

The TER represents the sum of normalized time-averaged exposure contributions from all active transmitters and is required to remain less than or equal to unity at all times.

The TAS framework dynamically allocates exposure budget among active transmitters to ensure continued compliance under simultaneous operation.

2.4 Definitions of uncertainty and design target

Term	Description
<i>SAR_regulatory_limit</i>	1.6W/Kg at 1g SAR for head 1.6 W/Kg at 1g SAR for body (Hotspot) 4.0W/Kg at 10g SAR for extremity
<i>total_uncertainty_SAR</i>	1.0 dB (considering Tx power variation, part to part deviation, etc.)
<i>SAR_design_target</i>	<i>SAR_design_target</i> should be less than 1.27 W/Kg Considering safety margin, 1.0 W/Kg is used as the value of <i>SAR_design_target</i>

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3 DUT DESCRIPTION

3.1 Device Overview

Band & Mode	Operating Modes	Tx Frequency
GSM/GPRS/EDGE 850	Voice/Data	824.20 - 848.80 MHz
GSM/GPRS/EDGE 1900	Voice/Data	1850.20 - 1909.80 MHz
UMTS 850	Voice/Data	826.40 - 846.60 MHz
UMTS 1750	Voice/Data	1712.4 - 1752.6 MHz
UMTS 1900	Voice/Data	1852.4 - 1907.6 MHz
LTE Band 71	Voice/Data	665.5 - 695.5 MHz
LTE Band 12	Voice/Data	699.7 - 715.3 MHz
LTE Band 13	Voice/Data	779.5 - 784.5 MHz
LTE Band 14	Voice/Data	790.5 - 795.5 MHz
LTE Band 26	Voice/Data	814.7 - 848.3 MHz
LTE Band 5	Voice/Data	824.7 - 848.3 MHz
LTE Band 66	Voice/Data	1710.7 - 1779.3 MHz
LTE Band 4	Voice/Data	1710.7 - 1754.3 MHz
LTE Band 25	Voice/Data	1850.7 - 1914.3 MHz
LTE Band 2	Voice/Data	1850.7 - 1909.3 MHz
LTE Band 30	Voice/Data	2307.5 - 2312.5 MHz
LTE Band 7	Voice/Data	2502.5 - 2567.5 MHz
LTE Band 41	Voice/Data	2498.5 - 2687.5 MHz
LTE Band 38	Voice/Data	2572.5 - 2617.5 MHz
LTE Band 48	Voice/Data	3552.5 - 3697.5 MHz
NR Band n71	Voice/Data	665.5 - 695.5 MHz
NR Band n5	Voice/Data	826.5 - 846.5 MHz
NR Band n70	Voice/Data	1697.5 - 1707.5 MHz
NR Band n66	Voice/Data	1712.5 - 1777.5 MHz
NR Band n25	Voice/Data	1852.5 - 1912.5 MHz
NR Band n2	Voice/Data	1852.5 - 1907.5 MHz
NR Band n30	Voice/Data	2307.5 - 2312.5 MHz
NR Band n41	Voice/Data	2501.01 - 2685 MHz
NR Band n48	Voice/Data	3555 - 3694.98 MHz
NR Band n78	Voice/Data	3455.01 - 3544.98 MHz; 3705 - 3795 MHz
NR Band n77	Voice/Data	3455.01 - 3544.98 MHz; 3705 - 3975 MHz
2.4 GHz WIFI	Voice/Data	2412 - 2462 MHz
5 GHz WIFI	Voice/Data	U-NII-1: 5180 - 5240 MHz U-NII-2A: 5260 - 5320 MHz U-NII-2C: 5500 - 5720 MHz U-NII-3: 5745 - 5825 MHz U-NII-4: 5845 - 5885 MHz
6 GHz WIFI	Voice/Data	U-NII-5: 5935 - 6415 MHz U-NII-6: 6435 - 6515 MHz U-NII-7: 6535 - 6875 MHz U-NII-8: 6895 - 7115 MHz
2.4 GHz Bluetooth	Data	2402 - 2480 MHz
NFC	Data	13.56 MHz

The DUT implements the Samsung S.LSI TAS framework to control and manage transmit power in real time and to ensure compliance with FCC time-averaged RF exposure requirements for all supported cellular and connectivity radio operations.

The supported radio technologies, operating modes, and frequency ranges are identical to those documented in the original RF exposure evaluation reports and are therefore not repeated in this summary.

The DUT also supports NFC technology; however, this radio is not controlled by the TAS framework and are evaluated separately.

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4 COMPLIANCE SUMMARY

4.1 RF Exposure Compliance Summary

All transmission scenarios supported by the DUT comply with FCC RF exposure requirements when operating under the Samsung S.LSI TAS framework.

Compliance is demonstrated through:

Baseline RF exposure characterization and derivation of SAR and PD design targets,

Static transmission evaluation under Part 1 test conditions,

Dynamic TAS validation under Part 2 test conditions.

For simultaneous transmission scenarios, the Total Exposure Ratio (TER) remains less than or equal to unity. Accordingly, the DUT is considered compliant with FCC RF exposure requirements under all supported operating conditions.

Table 4-1
Reported RF Exposure Levels

	RFx Evaluation	Power Level	FCC Limit	<u>Reported</u> RF Exposure Level	Test Report
SAR (W/kg)	Standalone 1g SAR	P_{limit}	1.6	1.20	FCC SAR Evaluation Report (Part 1)
	Standalone 10g SAR	P_{limit}	4.0	1.68	
	Simultaneous Tx 1g SAR	P_{limit}	1.6	1.59	
	Simultaneous Tx 10g SAR	P_{limit}	4.0	1.68	

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