



EX3DV4- SN:3847

April 26, 2018

10575-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	X	4.50	66.17	16.08	0.46	130.0	± 9.6 %
		Y	4.63	66.56	16.40		130.0	
		Z	4.35	66.16	15.93		130.0	
10576-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps, 90pc duty cycle)	X	4.52	66.33	16.14	0.46	130.0	± 9.6 %
		Y	4.66	66.72	16.46		130.0	
		Z	4.37	66.35	16.02		130.0	
10577-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	X	4.71	66.61	16.32	0.46	130.0	± 9.6 %
		Y	4.86	67.01	16.63		130.0	
		Z	4.54	66.60	16.17		130.0	
10578-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	X	4.60	66.74	16.40	0.46	130.0	± 9.6 %
		Y	4.76	67.17	16.73		130.0	
		Z	4.44	66.73	16.27		130.0	
10579-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	X	4.37	65.99	15.69	0.46	130.0	± 9.6 %
		Y	4.52	66.47	16.05		130.0	
		Z	4.19	65.88	15.49		130.0	
10580-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	X	4.42	66.07	15.73	0.46	130.0	± 9.6 %
		Y	4.57	66.51	16.08		130.0	
		Z	4.23	65.94	15.51		130.0	
10581-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	X	4.50	66.76	16.33	0.46	130.0	± 9.6 %
		Y	4.65	67.21	16.67		130.0	
		Z	4.34	66.76	16.22		130.0	
10582-AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	X	4.31	65.77	15.48	0.46	130.0	± 9.6 %
		Y	4.47	66.23	15.84		130.0	
		Z	4.12	65.65	15.26		130.0	
10583-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	X	4.50	66.17	16.08	0.46	130.0	± 9.6 %
		Y	4.63	66.56	16.40		130.0	
		Z	4.35	66.16	15.93		130.0	
10584-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	X	4.52	66.33	16.14	0.46	130.0	± 9.6 %
		Y	4.66	66.72	16.46		130.0	
		Z	4.37	66.35	16.02		130.0	
10585-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	X	4.71	66.61	16.32	0.46	130.0	± 9.6 %
		Y	4.86	67.01	16.63		130.0	
		Z	4.54	66.60	16.17		130.0	
10586-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	X	4.60	66.74	16.40	0.46	130.0	± 9.6 %
		Y	4.76	67.17	16.73		130.0	
		Z	4.44	66.73	16.27		130.0	
10587-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	X	4.37	65.99	15.69	0.46	130.0	± 9.6 %
		Y	4.52	66.47	16.05		130.0	
		Z	4.19	65.88	15.49		130.0	
10588-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	X	4.42	66.07	15.73	0.46	130.0	± 9.6 %
		Y	4.57	66.51	16.08		130.0	
		Z	4.23	65.94	15.51		130.0	
10589-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	X	4.50	66.76	16.33	0.46	130.0	± 9.6 %
		Y	4.65	67.21	16.67		130.0	
		Z	4.34	66.76	16.22		130.0	
10590-AAB	IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	X	4.31	65.77	15.48	0.46	130.0	± 9.6 %
		Y	4.47	66.23	15.84		130.0	
		Z	4.12	65.65	15.26		130.0	

Certificate No: EX3-3847_Apr18

Page 34 of 39



EX3DV4- SN:3847

April 26, 2018

10591-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS0, 90pc duty cycle)	X	4.65	66.26	16.20	0.46	130.0	± 9.6 %
		Y	4.78	66.62	16.49		130.0	
		Z	4.51	66.28	16.08		130.0	
10592-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS1, 90pc duty cycle)	X	4.79	66.57	16.33	0.46	130.0	± 9.6 %
		Y	4.94	66.96	16.63		130.0	
		Z	4.63	66.56	16.20		130.0	
10593-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS2, 90pc duty cycle)	X	4.71	66.46	16.20	0.46	130.0	± 9.6 %
		Y	4.86	66.87	16.51		130.0	
		Z	4.54	66.42	16.05		130.0	
10594-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS3, 90pc duty cycle)	X	4.76	66.63	16.36	0.46	130.0	± 9.6 %
		Y	4.91	67.03	16.66		130.0	
		Z	4.60	66.61	16.22		130.0	
10595-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS4, 90pc duty cycle)	X	4.73	66.58	16.25	0.46	130.0	± 9.6 %
		Y	4.88	66.98	16.56		130.0	
		Z	4.56	66.57	16.12		130.0	
10596-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS5, 90pc duty cycle)	X	4.66	66.56	16.25	0.46	130.0	± 9.6 %
		Y	4.82	66.98	16.56		130.0	
		Z	4.49	66.52	16.10		130.0	
10597-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS6, 90pc duty cycle)	X	4.61	66.45	16.11	0.46	130.0	± 9.6 %
		Y	4.77	66.89	16.45		130.0	
		Z	4.44	66.39	15.95		130.0	
10598-AAB	IEEE 802.11n (HT Mixed, 20MHz, MCS7, 90pc duty cycle)	X	4.59	66.66	16.37	0.46	130.0	± 9.6 %
		Y	4.75	67.11	16.70		130.0	
		Z	4.43	66.62	16.23		130.0	
10599-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS0, 90pc duty cycle)	X	5.34	66.83	16.48	0.46	130.0	± 9.6 %
		Y	5.45	67.17	16.70		130.0	
		Z	5.20	66.82	16.39		130.0	
10600-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS1, 90pc duty cycle)	X	5.48	67.28	16.68	0.46	130.0	± 9.6 %
		Y	5.58	67.55	16.86		130.0	
		Z	5.31	67.19	16.55		130.0	
10601-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS2, 90pc duty cycle)	X	5.36	67.01	16.55	0.46	130.0	± 9.6 %
		Y	5.47	67.32	16.77		130.0	
		Z	5.21	66.95	16.45		130.0	
10602-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS3, 90pc duty cycle)	X	5.48	67.14	16.54	0.46	130.0	± 9.6 %
		Y	5.56	67.34	16.70		130.0	
		Z	5.32	67.06	16.42		130.0	
10603-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS4, 90pc duty cycle)	X	5.54	67.39	16.80	0.46	130.0	± 9.6 %
		Y	5.65	67.65	16.98		130.0	
		Z	5.37	67.31	16.69		130.0	
10604-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS5, 90pc duty cycle)	X	5.41	67.02	16.60	0.46	130.0	± 9.6 %
		Y	5.46	67.14	16.71		130.0	
		Z	5.27	66.97	16.49		130.0	
10605-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS6, 90pc duty cycle)	X	5.47	67.20	16.69	0.46	130.0	± 9.6 %
		Y	5.56	67.45	16.87		130.0	
		Z	5.29	67.05	16.52		130.0	
10606-AAB	IEEE 802.11n (HT Mixed, 40MHz, MCS7, 90pc duty cycle)	X	5.19	66.44	16.16	0.46	130.0	± 9.6 %
		Y	5.32	66.83	16.42		130.0	
		Z	5.08	66.47	16.09		130.0	

Certificate No: EX3-3847_Apr18

Page 35 of 39



EX3DV4- SN:3847

April 26, 2018

10607-AAB	IEEE 802.11ac WiFi (20MHz, MCS0, 90pc duty cycle)	X	4.49	65.54	15.80	0.46	130.0	± 9.6 %
		Y	4.62	65.94	16.12		130.0	
		Z	4.35	65.57	15.69		130.0	
10608-AAB	IEEE 802.11ac WiFi (20MHz, MCS1, 90pc duty cycle)	X	4.65	65.91	15.96	0.46	130.0	± 9.6 %
		Y	4.81	66.35	16.29		130.0	
		Z	4.48	65.89	15.84		130.0	
10609-AAB	IEEE 802.11ac WiFi (20MHz, MCS2, 90pc duty cycle)	X	4.54	65.74	15.79	0.46	130.0	± 9.6 %
		Y	4.70	66.20	16.13		130.0	
		Z	4.38	65.70	15.64		130.0	
10610-AAB	IEEE 802.11ac WiFi (20MHz, MCS3, 90pc duty cycle)	X	4.59	65.90	15.95	0.46	130.0	± 9.6 %
		Y	4.75	66.36	16.29		130.0	
		Z	4.43	65.88	15.82		130.0	
10611-AAB	IEEE 802.11ac WiFi (20MHz, MCS4, 90pc duty cycle)	X	4.51	65.70	15.80	0.46	130.0	± 9.6 %
		Y	4.66	66.16	16.14		130.0	
		Z	4.34	65.67	15.66		130.0	
10612-AAB	IEEE 802.11ac WiFi (20MHz, MCS5, 90pc duty cycle)	X	4.51	65.84	15.83	0.46	130.0	± 9.6 %
		Y	4.67	66.32	16.18		130.0	
		Z	4.33	65.77	15.68		130.0	
10613-AAB	IEEE 802.11ac WiFi (20MHz, MCS6, 90pc duty cycle)	X	4.51	65.70	15.71	0.46	130.0	± 9.6 %
		Y	4.68	66.20	16.07		130.0	
		Z	4.32	65.60	15.53		130.0	
10614-AAB	IEEE 802.11ac WiFi (20MHz, MCS7, 90pc duty cycle)	X	4.46	65.88	15.93	0.46	130.0	± 9.6 %
		Y	4.62	66.38	16.29		130.0	
		Z	4.29	65.83	15.79		130.0	
10615-AAB	IEEE 802.11ac WiFi (20MHz, MCS8, 90pc duty cycle)	X	4.51	65.55	15.58	0.46	130.0	± 9.6 %
		Y	4.67	66.00	15.92		130.0	
		Z	4.33	65.49	15.41		130.0	
10616-AAB	IEEE 802.11ac WiFi (40MHz, MCS0, 90pc duty cycle)	X	5.15	66.03	16.05	0.46	130.0	± 9.6 %
		Y	5.27	66.43	16.32		130.0	
		Z	5.00	65.97	15.95		130.0	
10617-AAB	IEEE 802.11ac WiFi (40MHz, MCS1, 90pc duty cycle)	X	5.22	66.24	16.14	0.46	130.0	± 9.6 %
		Y	5.34	66.59	16.37		130.0	
		Z	5.04	66.10	15.99		130.0	
10618-AAB	IEEE 802.11ac WiFi (40MHz, MCS2, 90pc duty cycle)	X	5.10	66.23	16.14	0.46	130.0	± 9.6 %
		Y	5.22	66.60	16.39		130.0	
		Z	4.95	66.15	16.02		130.0	
10619-AAB	IEEE 802.11ac WiFi (40MHz, MCS3, 90pc duty cycle)	X	5.11	66.02	15.97	0.46	130.0	± 9.6 %
		Y	5.24	66.42	16.23		130.0	
		Z	4.97	65.97	15.87		130.0	
10620-AAB	IEEE 802.11ac WiFi (40MHz, MCS4, 90pc duty cycle)	X	5.20	66.06	16.05	0.46	130.0	± 9.6 %
		Y	5.33	66.46	16.31		130.0	
		Z	5.04	65.98	15.93		130.0	
10621-AAB	IEEE 802.11ac WiFi (40MHz, MCS5, 90pc duty cycle)	X	5.21	66.21	16.24	0.46	130.0	± 9.6 %
		Y	5.33	66.58	16.48		130.0	
		Z	5.05	66.10	16.11		130.0	
10622-AAB	IEEE 802.11ac WiFi (40MHz, MCS6, 90pc duty cycle)	X	5.22	66.37	16.31	0.46	130.0	± 9.6 %
		Y	5.34	66.74	16.55		130.0	
		Z	5.04	66.18	16.15		130.0	

Certificate No: EX3-3847_Apr18

Page 36 of 39



EX3DV4- SN:3847

April 26, 2018

10623-AAB	IEEE 802.11ac WiFi (40MHz, MCS7, 90pc duty cycle)	X	5.10	65.88	15.93	0.46	130.0	± 9.6 %
		Y	5.22	66.28	16.20		130.0	
		Z	4.93	65.72	15.77		130.0	
10624-AAB	IEEE 802.11ac WiFi (40MHz, MCS8, 90pc duty cycle)	X	5.29	66.10	16.11	0.46	130.0	± 9.6 %
		Y	5.41	66.47	16.36		130.0	
		Z	5.13	66.01	15.99		130.0	
10625-AAB	IEEE 802.11ac WiFi (40MHz, MCS9, 90pc duty cycle)	X	5.57	66.83	16.54	0.46	130.0	± 9.6 %
		Y	5.77	67.42	16.88		130.0	
		Z	5.22	66.17	16.14		130.0	
10626-AAB	IEEE 802.11ac WiFi (80MHz, MCS0, 90pc duty cycle)	X	5.46	66.12	16.04	0.46	130.0	± 9.6 %
		Y	5.57	66.49	16.27		130.0	
		Z	5.33	66.02	15.93		130.0	
10627-AAB	IEEE 802.11ac WiFi (80MHz, MCS1, 90pc duty cycle)	X	5.71	66.74	16.32	0.46	130.0	± 9.6 %
		Y	5.80	67.03	16.50		130.0	
		Z	5.57	66.65	16.21		130.0	
10628-AAB	IEEE 802.11ac WiFi (80MHz, MCS2, 90pc duty cycle)	X	5.48	66.16	15.96	0.46	130.0	± 9.6 %
		Y	5.60	66.59	16.22		130.0	
		Z	5.33	66.00	15.81		130.0	
10629-AAB	IEEE 802.11ac WiFi (80MHz, MCS3, 90pc duty cycle)	X	5.56	66.26	16.00	0.46	130.0	± 9.6 %
		Y	5.68	66.64	16.24		130.0	
		Z	5.43	66.19	15.91		130.0	
10630-AAB	IEEE 802.11ac WiFi (80MHz, MCS4, 90pc duty cycle)	X	5.96	67.65	16.70	0.46	130.0	± 9.6 %
		Y	6.09	68.07	16.95		130.0	
		Z	5.68	67.14	16.38		130.0	
10631-AAB	IEEE 802.11ac WiFi (80MHz, MCS5, 90pc duty cycle)	X	5.85	67.41	16.77	0.46	130.0	± 9.6 %
		Y	6.00	67.90	17.05		130.0	
		Z	5.64	67.15	16.59		130.0	
10632-AAB	IEEE 802.11ac WiFi (80MHz, MCS6, 90pc duty cycle)	X	5.68	66.81	16.49	0.46	130.0	± 9.6 %
		Y	5.77	67.09	16.67		130.0	
		Z	5.57	66.83	16.45		130.0	
10633-AAB	IEEE 802.11ac WiFi (80MHz, MCS7, 90pc duty cycle)	X	5.54	66.34	16.08	0.46	130.0	± 9.6 %
		Y	5.66	66.75	16.33		130.0	
		Z	5.36	66.11	15.91		130.0	
10634-AAB	IEEE 802.11ac WiFi (80MHz, MCS8, 90pc duty cycle)	X	5.52	66.35	16.14	0.46	130.0	± 9.6 %
		Y	5.65	66.78	16.40		130.0	
		Z	5.38	66.27	16.04		130.0	
10635-AAB	IEEE 802.11ac WiFi (80MHz, MCS9, 90pc duty cycle)	X	5.40	65.69	15.55	0.46	130.0	± 9.6 %
		Y	5.53	66.13	15.82		130.0	
		Z	5.24	65.52	15.38		130.0	
10636-AAC	IEEE 802.11ac WiFi (160MHz, MCS0, 90pc duty cycle)	X	5.89	66.51	16.15	0.46	130.0	± 9.6 %
		Y	5.98	66.86	16.36		130.0	
		Z	5.77	66.40	16.04		130.0	
10637-AAC	IEEE 802.11ac WiFi (160MHz, MCS1, 90pc duty cycle)	X	6.05	66.90	16.33	0.46	130.0	± 9.6 %
		Y	6.13	67.23	16.53		130.0	
		Z	5.89	66.72	16.18		130.0	
10638-AAC	IEEE 802.11ac WiFi (160MHz, MCS2, 90pc duty cycle)	X	6.04	66.86	16.29	0.46	130.0	± 9.6 %
		Y	6.13	67.21	16.49		130.0	
		Z	5.91	66.76	16.18		130.0	

Certificate No: EX3-3847_Apr18

Page 37 of 39



EX3DV4- SN:3847

April 26, 2018

10639-AAC	IEEE 802.11ac WiFi (160MHz, MCS3, 90pc duty cycle)	X	6.01	66.78	16.29	0.46	130.0	± 9.6 %
		Y	6.11	67.16	16.52		130.0	
		Z	5.87	66.64	16.16		130.0	
10640-AAC	IEEE 802.11ac WiFi (160MHz, MCS4, 90pc duty cycle)	X	6.01	66.78	16.23	0.46	130.0	± 9.6 %
		Y	6.12	67.18	16.47		130.0	
		Z	5.83	66.54	16.05		130.0	
10641-AAC	IEEE 802.11ac WiFi (160MHz, MCS5, 90pc duty cycle)	X	6.08	66.77	16.25	0.46	130.0	± 9.6 %
		Y	6.16	67.08	16.43		130.0	
		Z	5.93	66.63	16.12		130.0	
10642-AAC	IEEE 802.11ac WiFi (160MHz, MCS6, 90pc duty cycle)	X	6.10	66.96	16.51	0.46	130.0	± 9.6 %
		Y	6.20	67.33	16.72		130.0	
		Z	5.95	66.83	16.39		130.0	
10643-AAC	IEEE 802.11ac WiFi (160MHz, MCS7, 90pc duty cycle)	X	5.95	66.67	16.26	0.46	130.0	± 9.6 %
		Y	6.04	67.02	16.47		130.0	
		Z	5.80	66.51	16.11		130.0	
10644-AAC	IEEE 802.11ac WiFi (160MHz, MCS8, 90pc duty cycle)	X	6.06	67.02	16.46	0.46	130.0	± 9.6 %
		Y	6.20	67.51	16.74		130.0	
		Z	5.86	66.69	16.23		130.0	
10645-AAC	IEEE 802.11ac WiFi (160MHz, MCS9, 90pc duty cycle)	X	6.22	67.15	16.49	0.46	130.0	± 9.6 %
		Y	6.53	68.09	16.99		130.0	
		Z	6.01	66.82	16.26		130.0	
10646-AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2,7)	X	12.46	102.82	35.86	9.30	60.0	± 9.6 %
		Y	25.38	119.99	41.31		60.0	
		Z	6.60	88.90	30.62		60.0	
10647-AAC	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK, UL Subframe=2,7)	X	10.85	100.16	35.12	9.30	60.0	± 9.6 %
		Y	20.81	115.94	40.28		60.0	
		Z	5.89	86.80	29.96		60.0	
10648-AAA	CDMA2000 (1x Advanced)	X	0.51	60.75	7.97	0.00	150.0	± 9.6 %
		Y	0.66	63.18	10.50		150.0	
		Z	0.41	60.00	6.58		150.0	
10652-AAB	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	X	3.30	65.73	15.83	2.23	80.0	± 9.6 %
		Y	3.62	67.09	16.80		80.0	
		Z	3.01	65.04	15.12		80.0	
10653-AAB	LTE-TDD (OFDMA, 10 MHz, E-TM 3.1, Clipping 44%)	X	3.88	65.34	16.17	2.23	80.0	± 9.6 %
		Y	4.12	66.32	16.85		80.0	
		Z	3.63	64.83	15.69		80.0	
10654-AAB	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	X	3.88	65.02	16.21	2.23	80.0	± 9.6 %
		Y	4.09	65.94	16.83		80.0	
		Z	3.66	64.54	15.77		80.0	
10655-AAB	LTE-TDD (OFDMA, 20 MHz, E-TM 3.1, Clipping 44%)	X	3.95	65.00	16.26	2.23	80.0	± 9.6 %
		Y	4.15	65.93	16.86		80.0	
		Z	3.74	64.49	15.83		80.0	
10658-AAA	Pulse Waveform (200Hz, 10%)	X	100.00	110.04	25.52	10.00	50.0	± 9.6 %
		Y	100.00	112.50	26.65		50.0	
		Z	4.52	71.85	13.49		50.0	
10659-AAA	Pulse Waveform (200Hz, 20%)	X	100.00	108.16	23.56	6.99	60.0	± 9.6 %
		Y	100.00	112.26	25.56		60.0	
		Z	3.99	73.17	12.80		60.0	

Certificate No: EX3-3847_Apr18

Page 38 of 39



EX3DV4- SN:3847

April 26, 2018

10660-AAA	Pulse Waveform (200Hz, 40%)	X	100.00	105.70	21.19	3.98	80.0	± 9.6 %
		Y	100.00	114.35	25.21		80.0	
		Z	1.97	69.76	10.09		80.0	
10661-AAA	Pulse Waveform (200Hz, 60%)	X	100.00	100.43	17.89	2.22	100.0	± 9.6 %
		Y	100.00	117.83	25.42		100.0	
		Z	0.29	60.00	4.69		100.0	
10662-AAA	Pulse Waveform (200Hz, 80%)	X	0.17	60.00	3.90	0.97	120.0	± 9.6 %
		Y	100.00	119.81	24.45		120.0	
		Z	12.34	60.39	1.42		120.0	

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



MR-608_18-124



In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com [Http://www.chinattl.cn](http://www.chinattl.cn)



中国认可
国际互认
校准
CALIBRATION
CNAS L0570

Client : **ATL**Certificate No: **Z18-60043****CALIBRATION CERTIFICATE**

Object **DAE4 - SN: 541**

Calibration Procedure(s) **FF-Z11-002-01**
Calibration Procedure for the Data Acquisition Electronics (DAEx)

Calibration date: **March 22, 2018**

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)°C and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Process Calibrator 753	1971018	27-Jun-17 (CTTL, No.J17X05859)	June-18

	Name	Function	Signature
Calibrated by:	Yu Zongying	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 23, 2018

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: Z18-60043

Page 1 of 3



Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

Glossary:

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters:

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The report provide only calibration results for DAE, it does not contain other performance test results.



Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2512 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = $6.1\mu\text{V}$, full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	$404.524 \pm 0.15\% (k=2)$	$404.384 \pm 0.15\% (k=2)$	$404.149 \pm 0.15\% (k=2)$
Low Range	$3.96849 \pm 0.7\% (k=2)$	$3.93466 \pm 0.7\% (k=2)$	$3.97493 \pm 0.7\% (k=2)$

Connector Angle

Connector Angle to be used in DASY system	$289^\circ \pm 1^\circ$
---	-------------------------