

**TYPICAL CHARACTERISTICS
ON
PS-500M2G-10B-SFF-MIL-SM**

PMI MODEL PS-500M2G-10B-SFF-MIL-SM IS A 0.5 TO 2 GHz DIGITALLY CONTROLLED ANALOG PHASE SHIFTER WITH THE CAPABILITY FOR PHASE SHIFTING FROM 0 TO 360 DEG. THE UNIT CONSISTS OF AN ANALOG PHASE SHIFTER AND A DIGITAL-TO-ANALOG CONVERTER (EXTERNAL LATCH/STRB) WITH TEN LOGIC INPUT LINES THAT ALLOW 1024 DISCRETE VALUES OF PHASE.



REPORTED BY: ANTON L.
TESTED BY: ANTON L.
DATE: 12/22/2025

TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

PRODUCT FEATURE

DESCRIPTION

PMI MODEL NUMBER PS-500M2G-10B-SFF-MIL-SM IS A 0.5 TO 2GHz DIGITALLY CONTROLLED ANALOG PHASE SHIFTER WITH CAPABILITY FOR PHASE SHIFTING FROM 0° TO 360°. THE UNIT CONSISTS OF AN ANALOG PHASE SHIFTER AND A DIGITAL-TO-ANALOG CONVERTER (EXTERNAL LATCH/STRB) WITH TEN LOGIC INPUT LINES ALLOW 1024 DISCRETE VALUES OF PHASE.

SPECIFICATIONS @+25°C

- FREQUENCY RANGE: 0.5 TO 2 GHz
- CONTROL: 10 BIT TTL**
- INSERTION LOSS: 13dB MAX
- PHASE SHIFT: 360° TYP
- AMPLITUDE ERROR: ±1.0 dB MAX.
- PHASE SHIFT ERROR: ±5° MAX.
- SWITCHING SPEED: 500 ns MAX.
- SPURIOUS: -60dBc MAX.
- POWER SUPPLY
 - +V: +15V @ 250 mA TYP., 300 mA MAX.
 - V: -15V @ 20 mA TYP., 100 mA MAX.
- SIZE: 3.25" X 3.25" X 0.84"
- WEIGHT: 10 oz MAX.
- CONNECTORS(RF): SMA FEMALE
- CONNECTOR (CONTROL): 15 PIN SUBMINIATURE D (MALE) - MATE SUPPLIED
- FINISH: BLUE EPOXY POLIMIDE COATING IAW MIL-C-22750, TYPE I OVER EPOXY POLIMIDE PRIMER IAW MIL-P-23377 TYPE I, CLASS 1 OR 3.



** Device uses external latch/strb. Latch is triggered on the rising edge and reset on the falling edge before able to process next digital word. Reference state is all bits low '0'. Control Lines have an internal pull-down resistor.

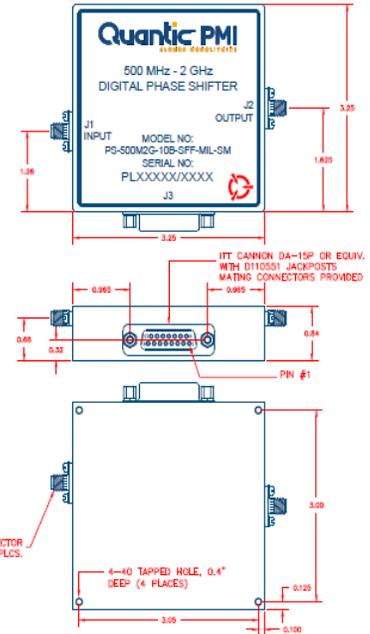
ENVIRONMENTAL RATINGS

- TEMPERATURE:** -20°C TO +85°C (OPERATING)
-40°C TO +85°C (STORAGE)
- HUMIDITY:** MIL-HDBK-5400 4.6.2.4 NOTE: Operating Relative Humidity: 90% max. with non-condensation. **Condensation control is implemented by the system.
- SHOCK:** MIL-HDBK-5400 4.6.2.6
Only, Sawtooth wave 20G, 11ms (MIL-STD-810 method 516.5 procedure I)
Altitude : MIL-HDBK-5400 CLASS1 Note: Upper limit of Altitude shall be 10,500ft.
- VIBRATION:** MIL-HDBK-5400 4.6.2.5 Only, JET AIRCRAFT
Functional test: W1=0.04G²/Hz, W2=0.03G²/Hz,
Overall=6.86Grms: 0.5Hr x 2times x 3directions
Endurance test: W1=0.04G²/Hz, W2=0.166G²/Hz,
Overall=15.07Grms: 3Hr x 3directions."

ELECTRICAL CONNECTOR PIN ASSIGNMENTS	
PIN	FUNCTION
1	-VDC
2	+VDC
3	LATCH/STRB
4	1.4"
5	5.6"
6	4.9"
7	180.0° (MSB)
8	90°
9	GND
10	N/C
11	22.5°
12	2.8"
13	11.3"
14	0.7"
15	0.30" (LSB)

ALL DIMENSIONS ARE IN INCHES
TOLERANCES:
X.XX ±0.020
X.XXX ±0.010

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A1	ORIGINAL RELEASE	01/26/23	
	A2	ECN # 23-0090	5/8/23	
	A3	ECN # 25-0313	12/18/25	



7311-A GROVE ROAD
FREDERICK, MARYLAND 21704 USA
TEL: (301)-662-5019, FAX: (301)-662-1731
WEB: www.quantipmi.com
EMAIL: sales@quantipmi.com
ISO 9001 CERTIFIED

APPROVALS		DATE	TITLE		REV.
DRAWN	R. SIRK	01/26/23	PRODUCT FEATURE		A3
REDRW			SIZE	FRGM NO.	DWG NO.
ISSUED			A	05XQ0	27045660
			SCALE	N:S	SHEET 1 OF 1

TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

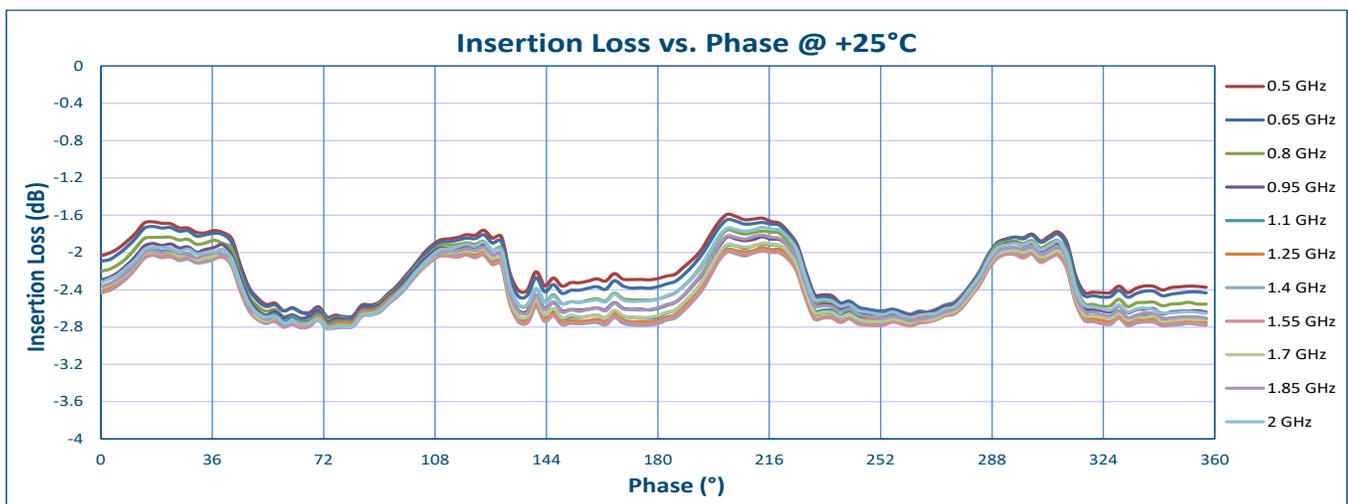
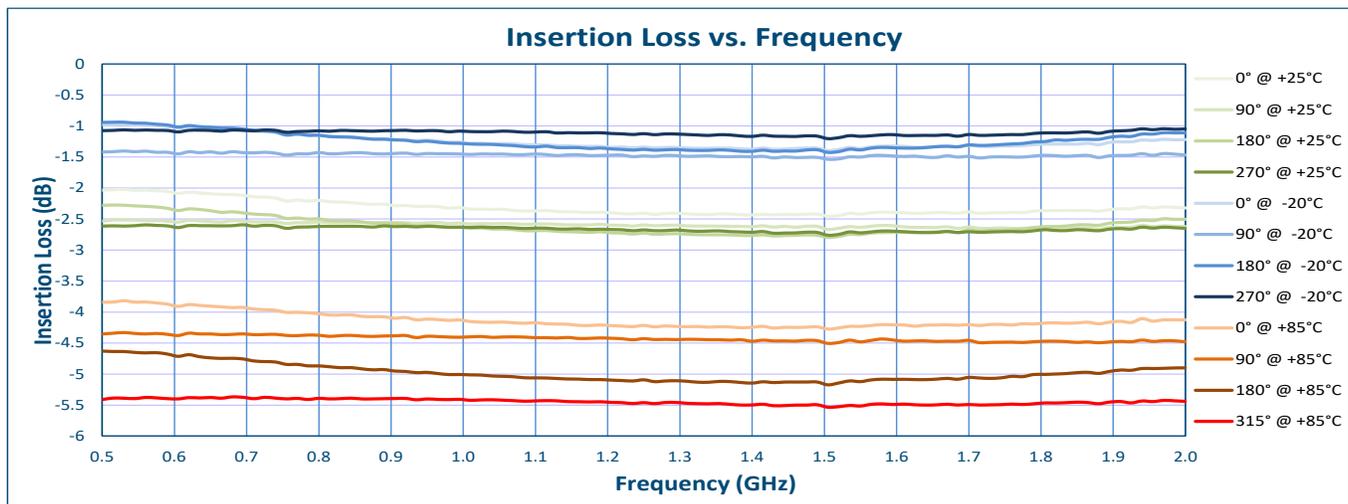
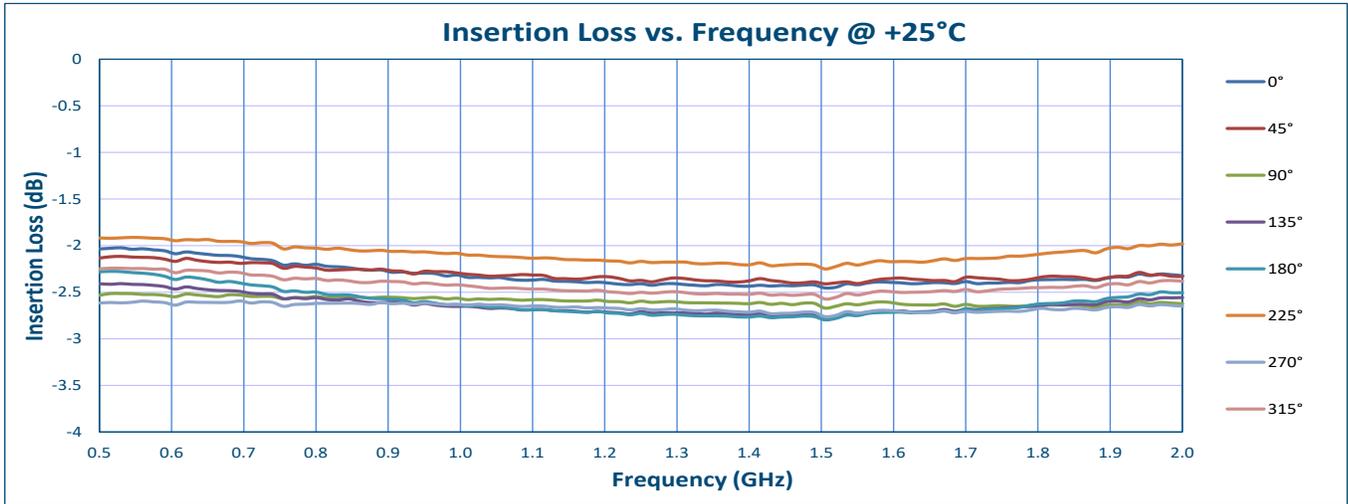
TECHNICAL SPECIFICATIONS

Data Taken at -10 dBm Input Power

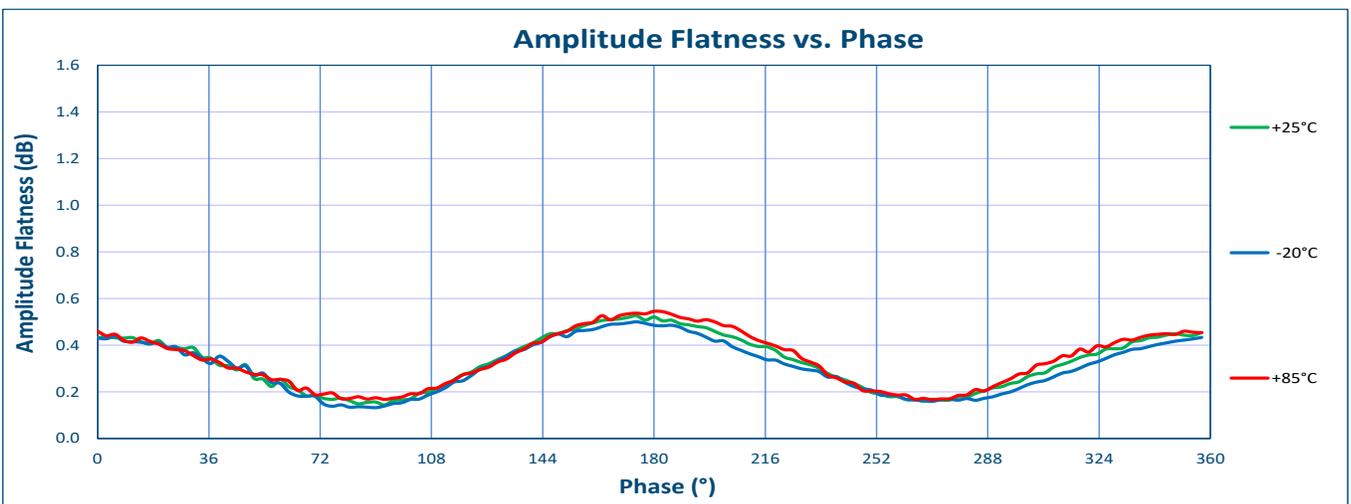
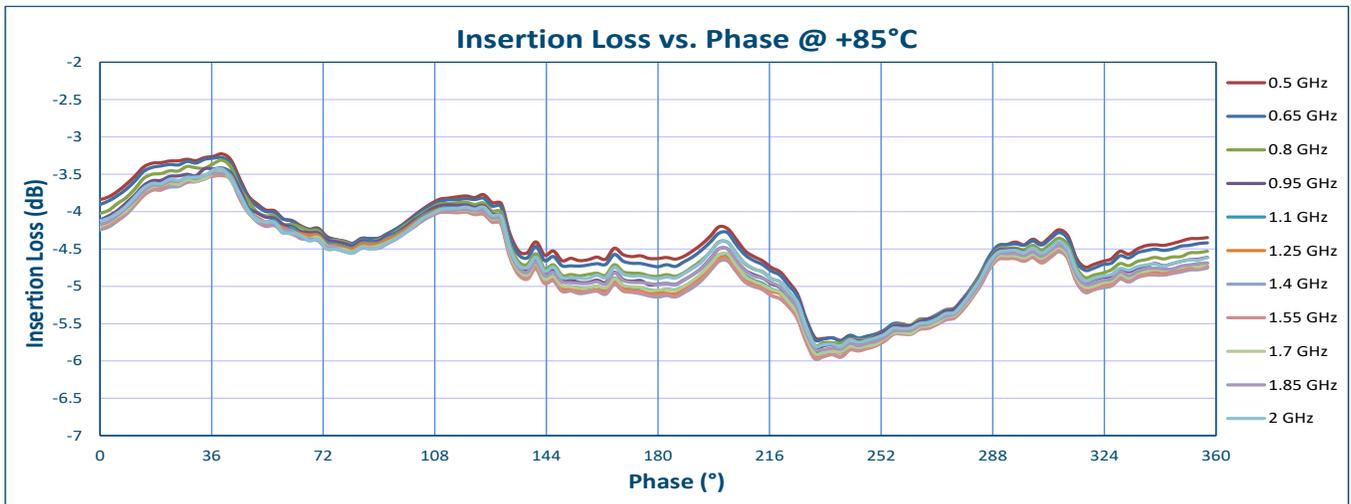
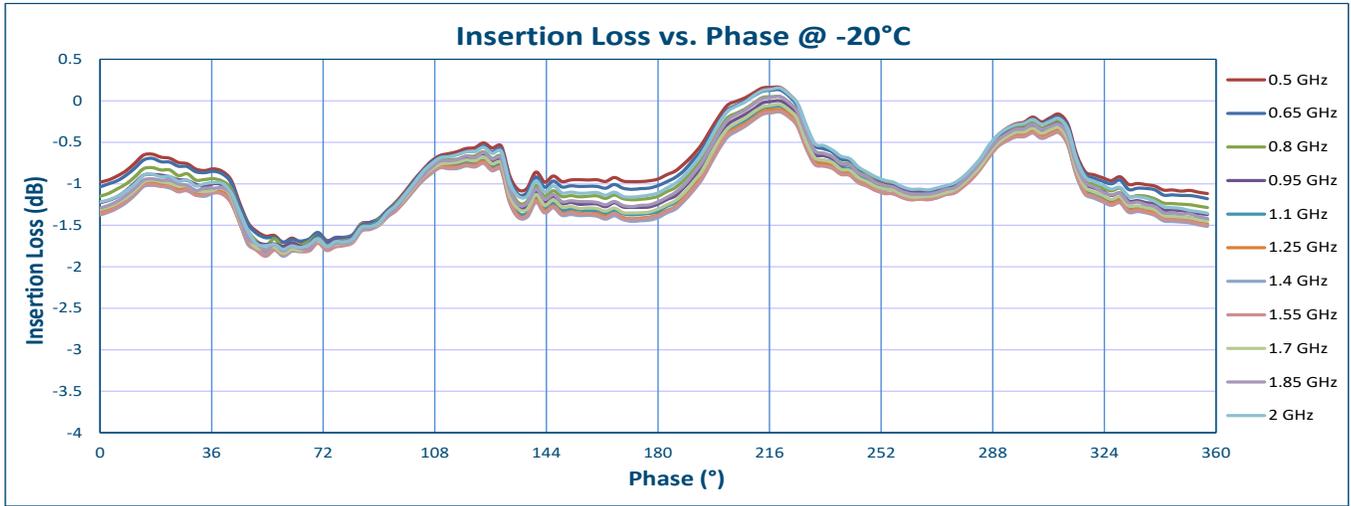
Test Item No.	Parameters	Specified Value @ +25°C	Measured Value		
			-20°C	+25°C	+85°C
1	Frequency Range:	0.5 TO 2 GHz	0.5 TO 2 GHz		
2	Control:	10 Bit TTL	10 Bit TTL		
3	Insertion Loss:	13 dB MAX.	1.9 dB	2.9 dB	6 dB
4	Phase Shift:	360°	359.33°	359.62°	359.86°
5	Amplitude Error:	±1.0 dB MAX.	±0.97 dB	±0.55 dB	±1.25 dB
6	Phase Shift Error:	±5° MAX.	±6.26° See Plot	±1.69° See Plot	±8.69° See Plot
7	Switching Speed:	500 ns MAX.	73.6 ns	76.8 ns	54.4 ns
8	Spurious:	-60 dBc MIN.	-69.4 dBc	-73.3 dBc	-71.6 dBc
9	DC Supply:	+15 V @ 250 mA TYP., 300 mA MAX. -15 V @ 20 mA TYP., 100 mA MAX.	+15 V @ 235 mA MAX. -15 V @ 40 mA MAX.		

-20°C			+25°C			+85°C		
Programed Phase Shift	Average Phase Shift	Average Signed Phase Error	Programed Phase Shift	Average Phase Shift	Average Signed Phase Error	Programed Phase Shift	Average Phase Shift	Average Signed Phase Error
DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG	DEG
0.35	0.35	0.00	0.35	0.35	0.16	0.35	0.36	0.24
0.70	0.71	0.01	0.70	0.71	0.23	0.70	0.73	0.28
1.41	1.42	0.01	1.41	1.44	0.40	1.41	1.47	0.45
2.81	2.60	-0.21	2.81	2.62	0.55	2.81	2.69	0.55
5.62	5.48	-0.14	5.62	5.55	0.30	5.62	5.69	0.33
11.25	10.93	-0.32	11.25	11.07	0.73	11.25	11.29	0.77
22.50	22.02	-0.48	22.50	22.21	0.48	22.50	22.32	0.37
45.00	45.12	0.12	45.00	44.33	0.88	45.00	42.23	0.92
90.00	92.71	2.71	90.00	89.91	0.35	90.00	85.05	0.32
180.00	183.40	3.40	180.00	179.90	0.77	180.00	173.99	0.73

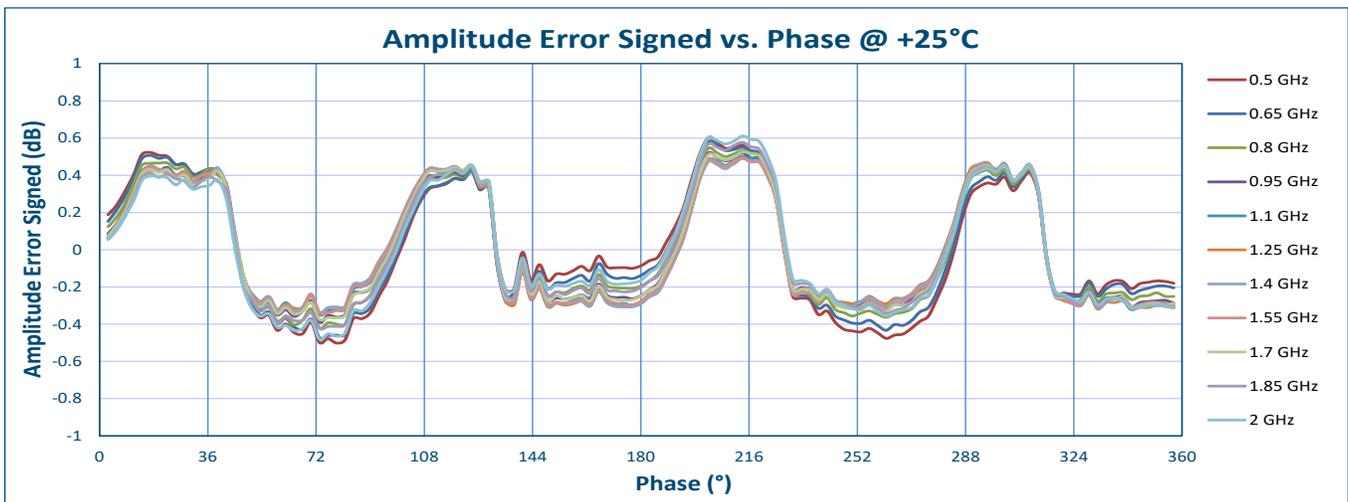
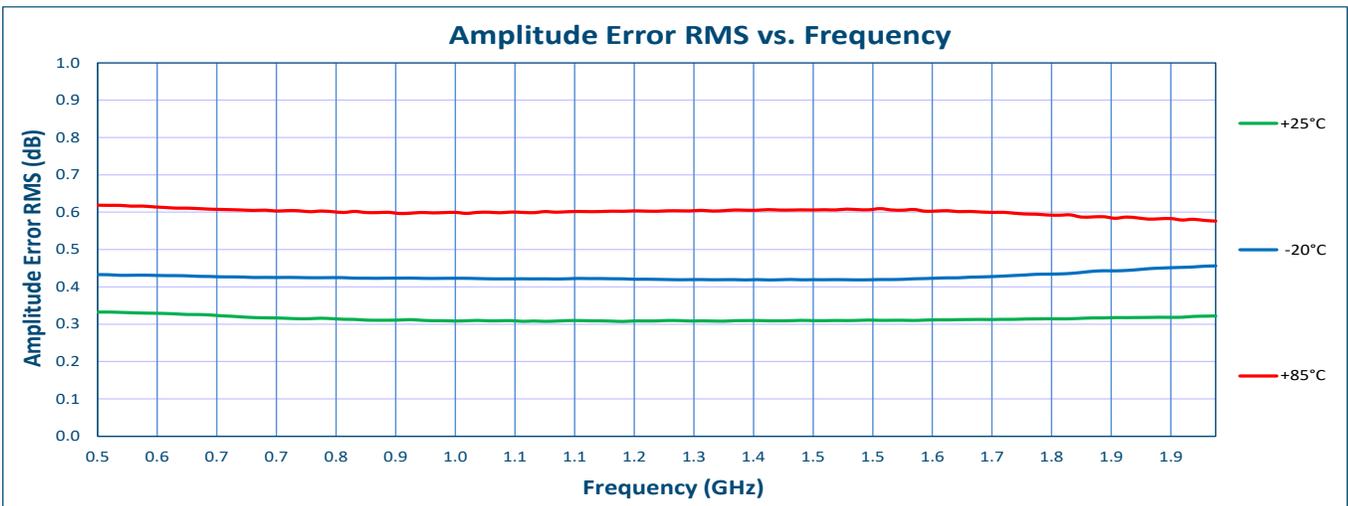
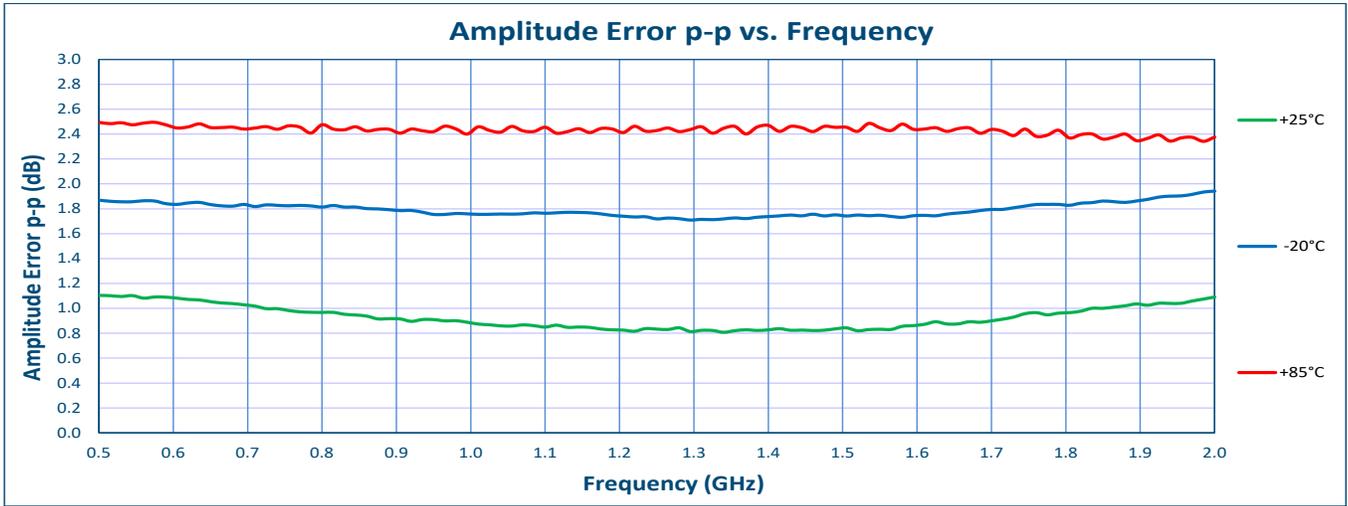
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



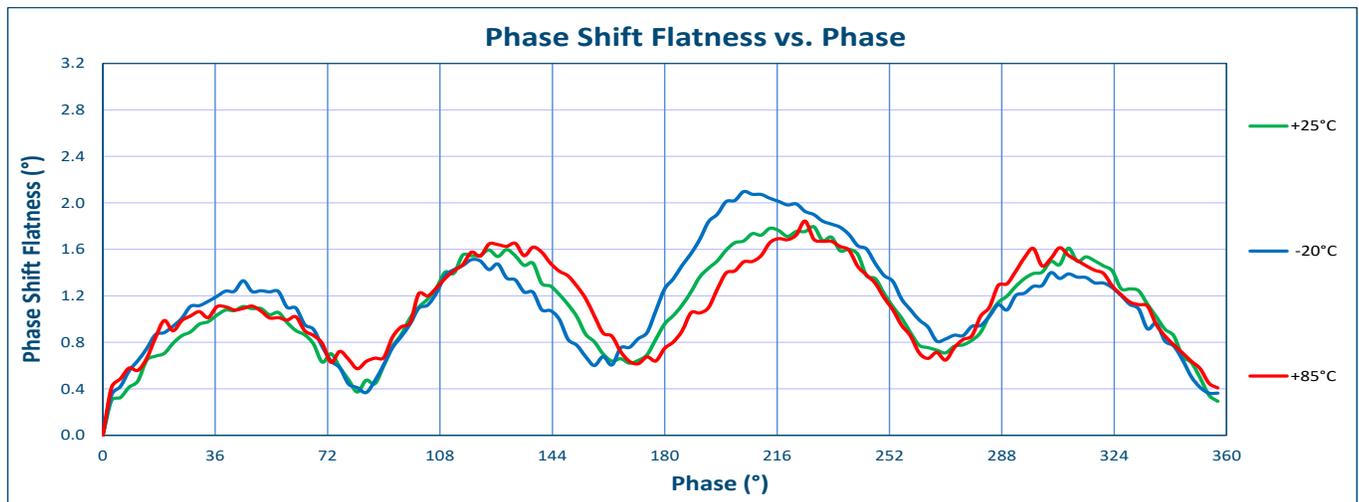
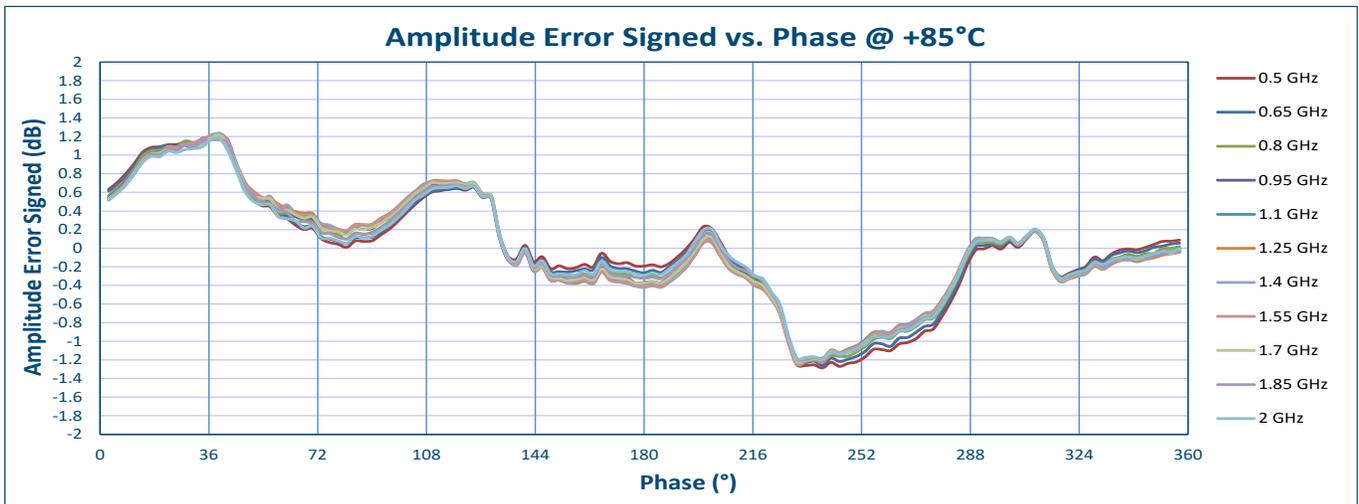
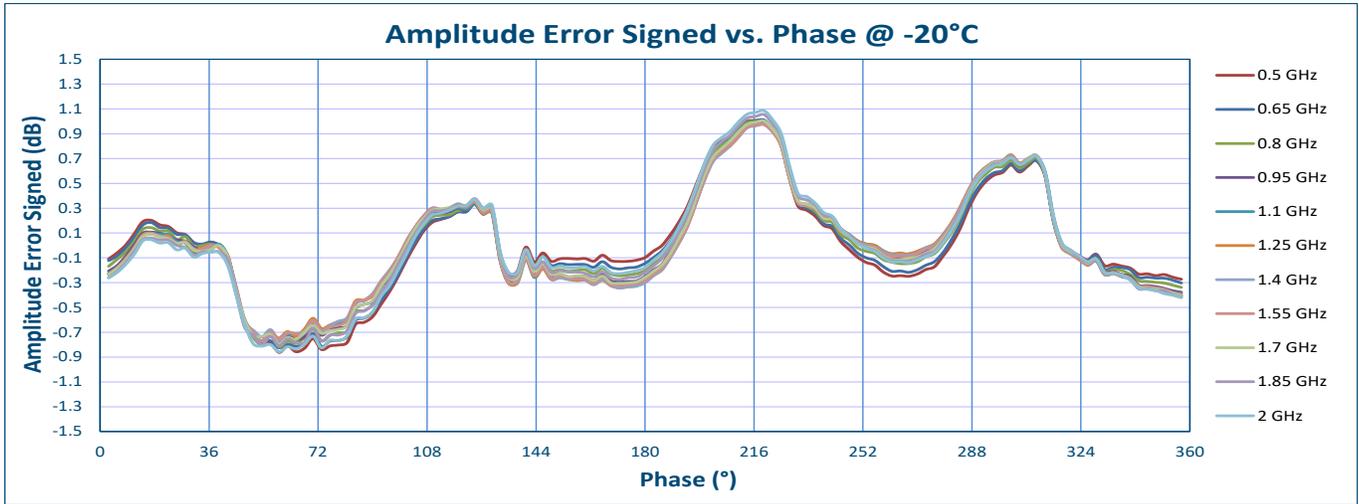
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



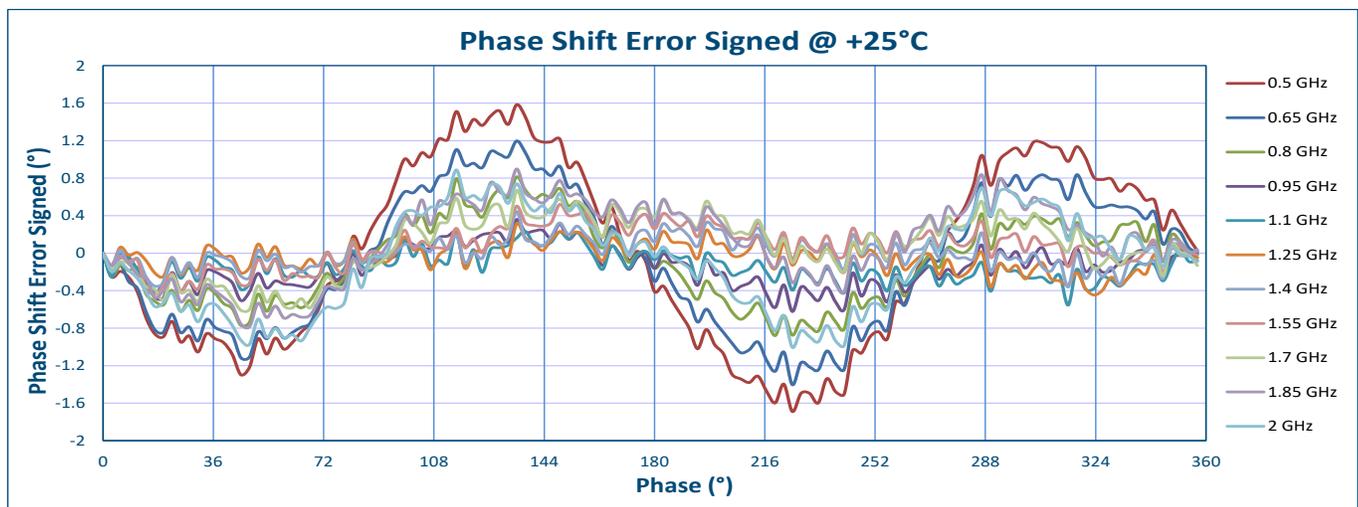
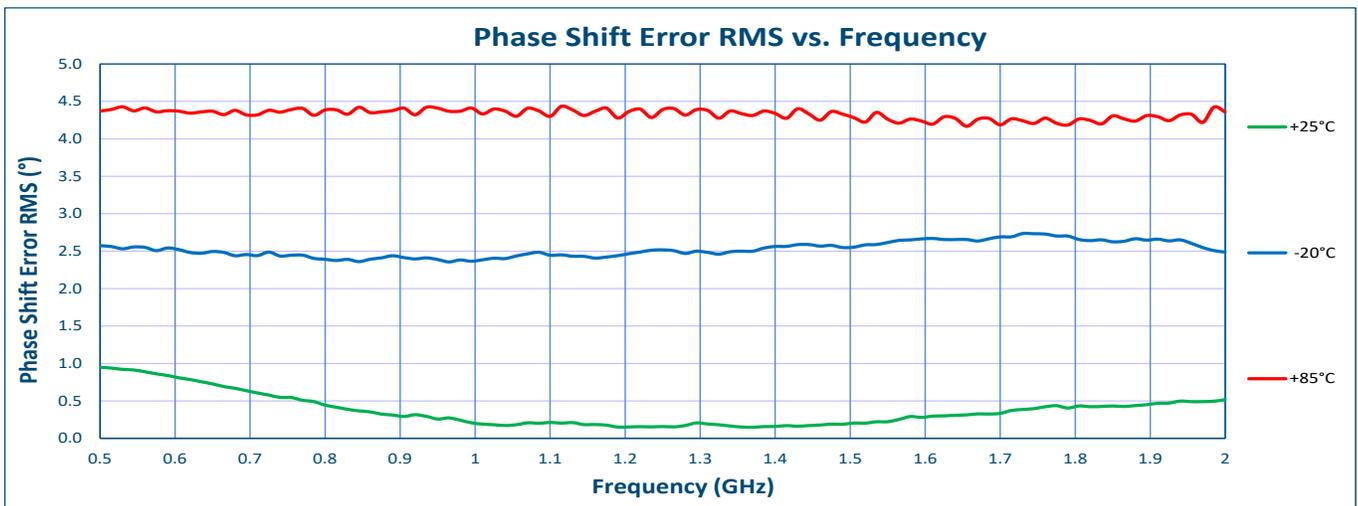
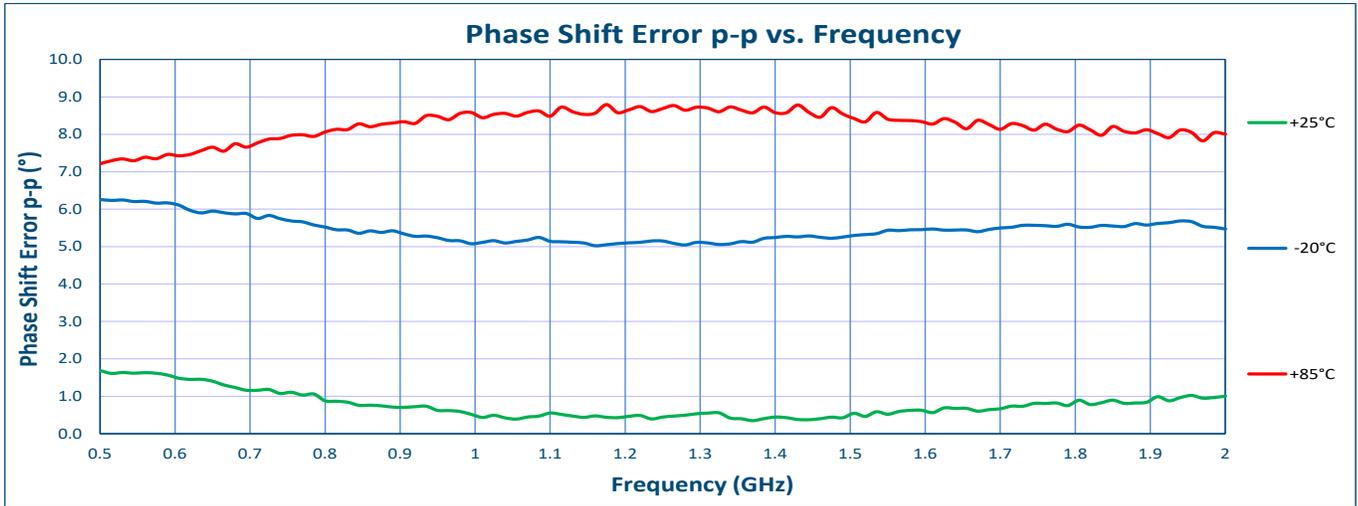
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



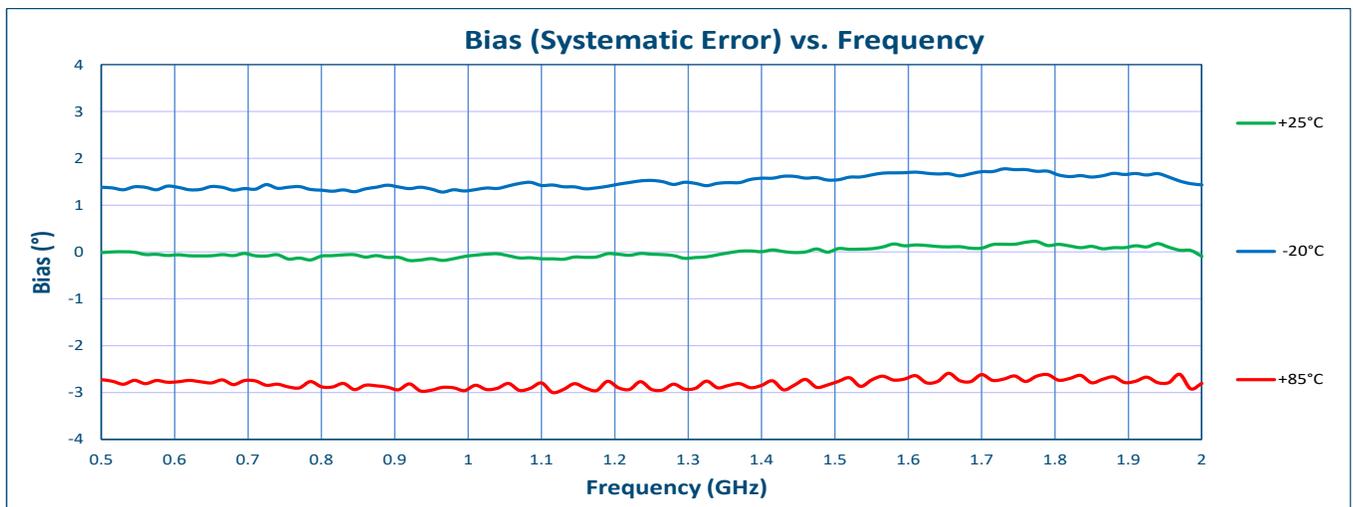
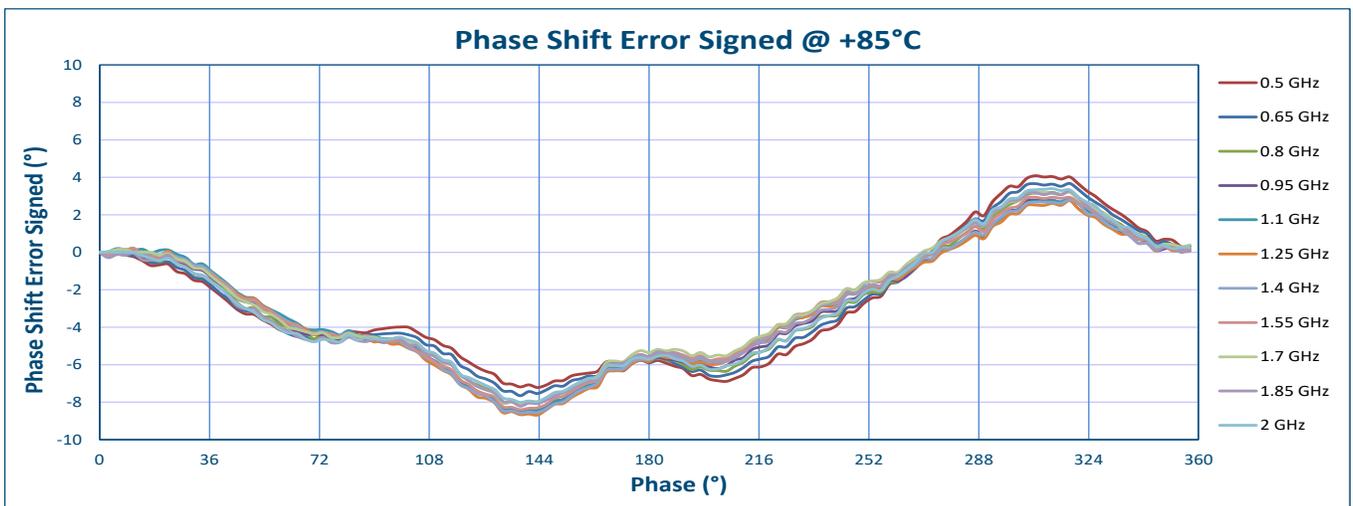
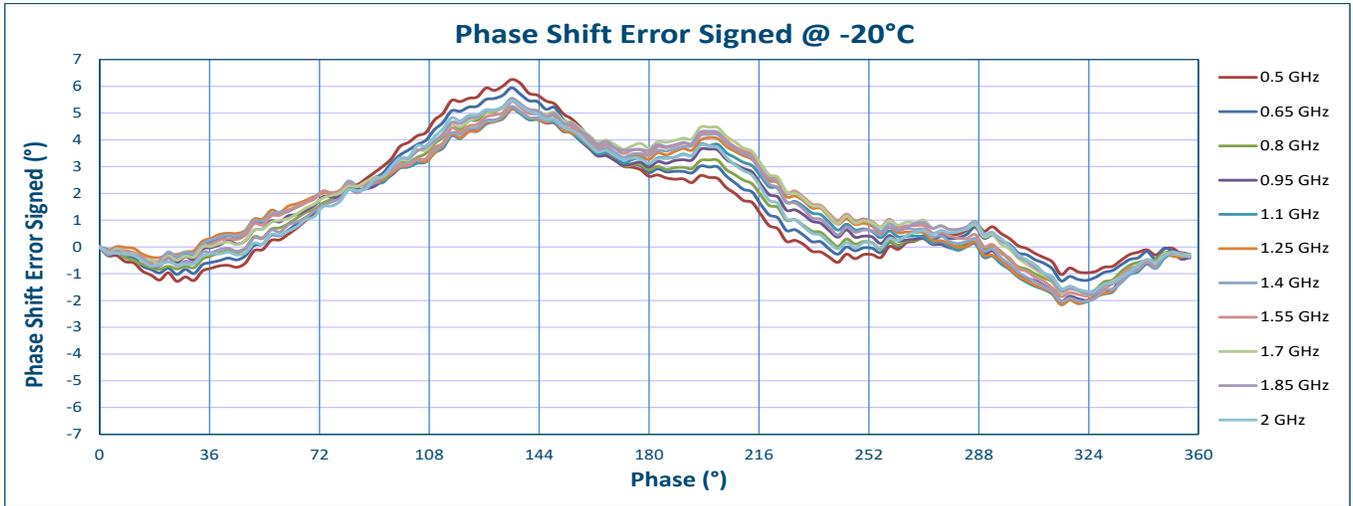
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



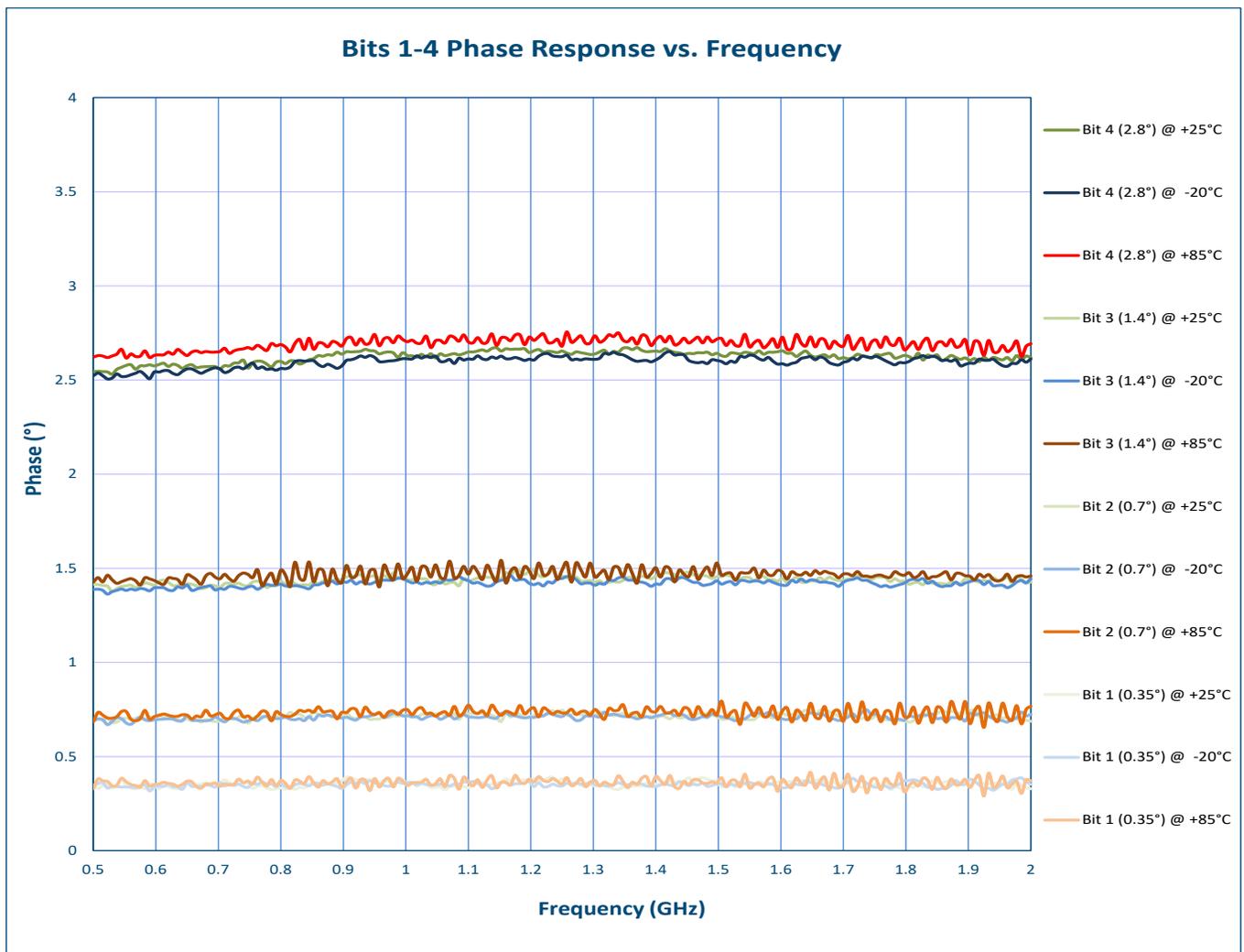
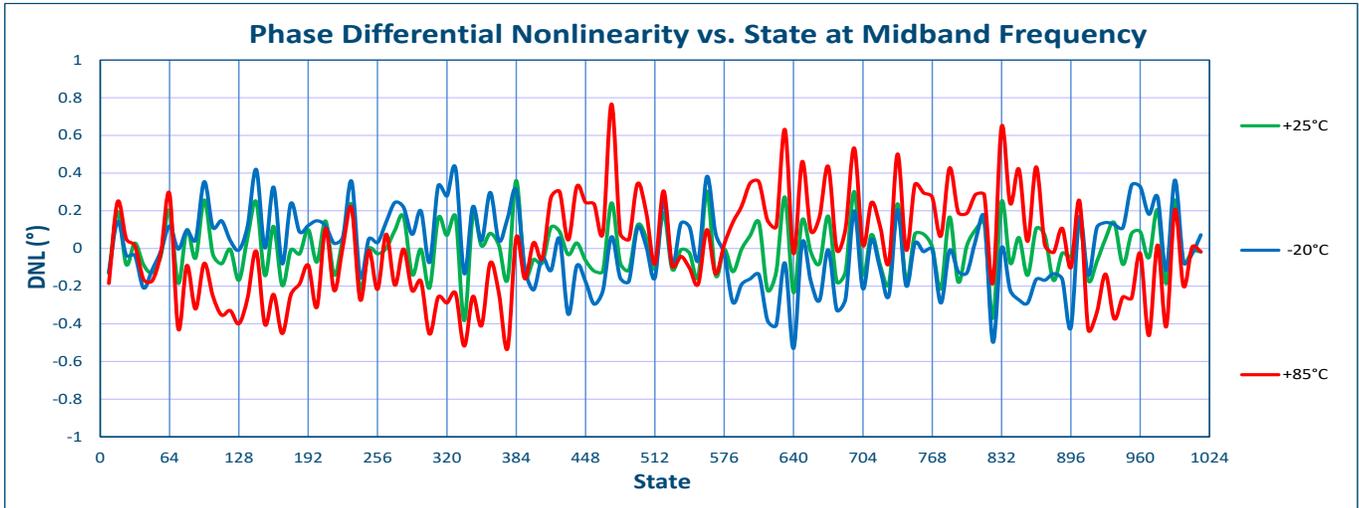
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



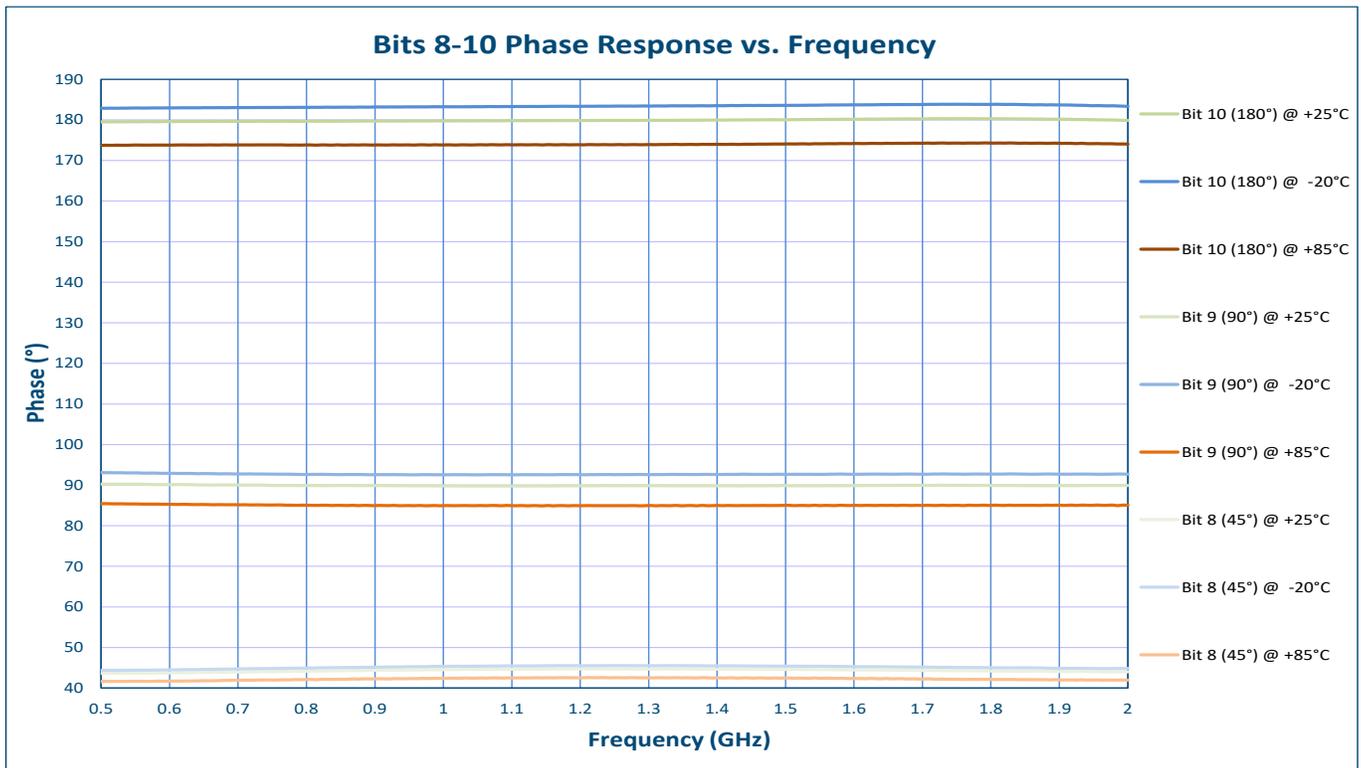
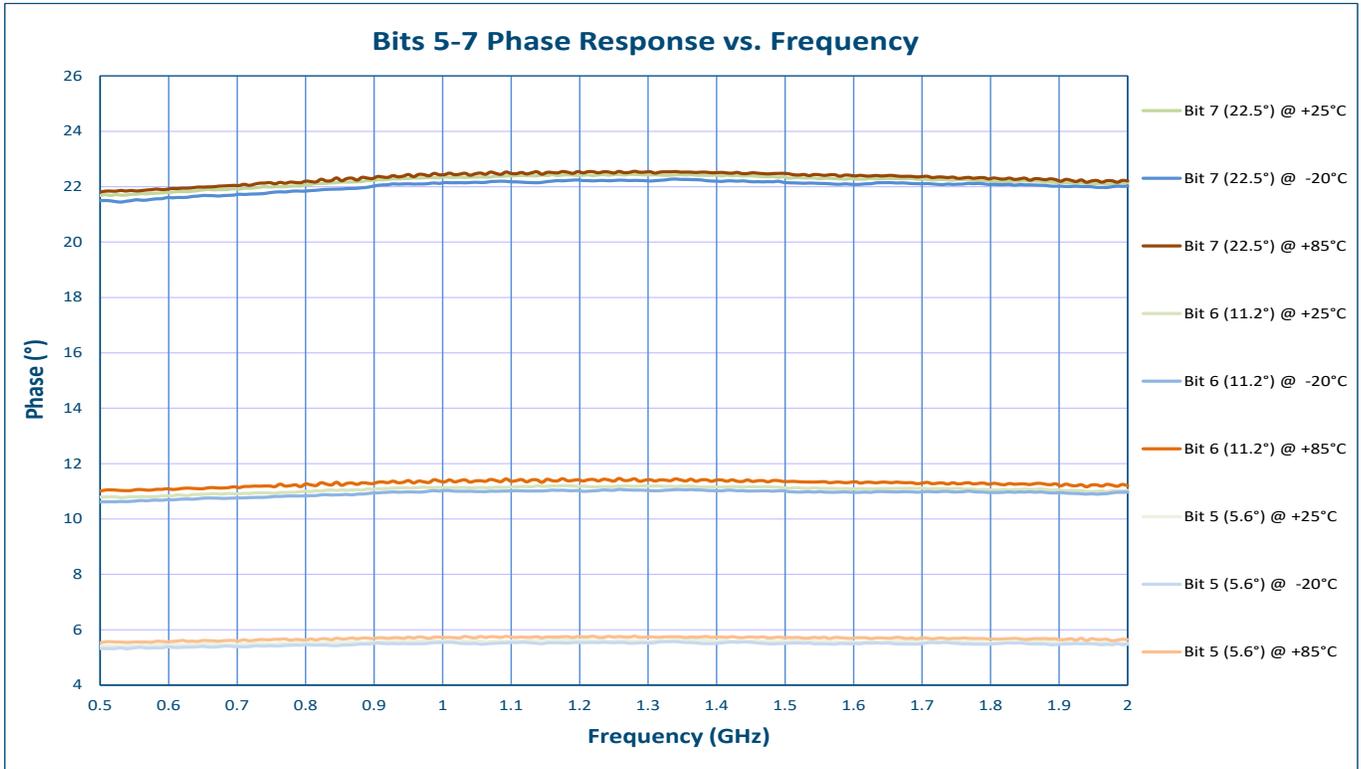
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

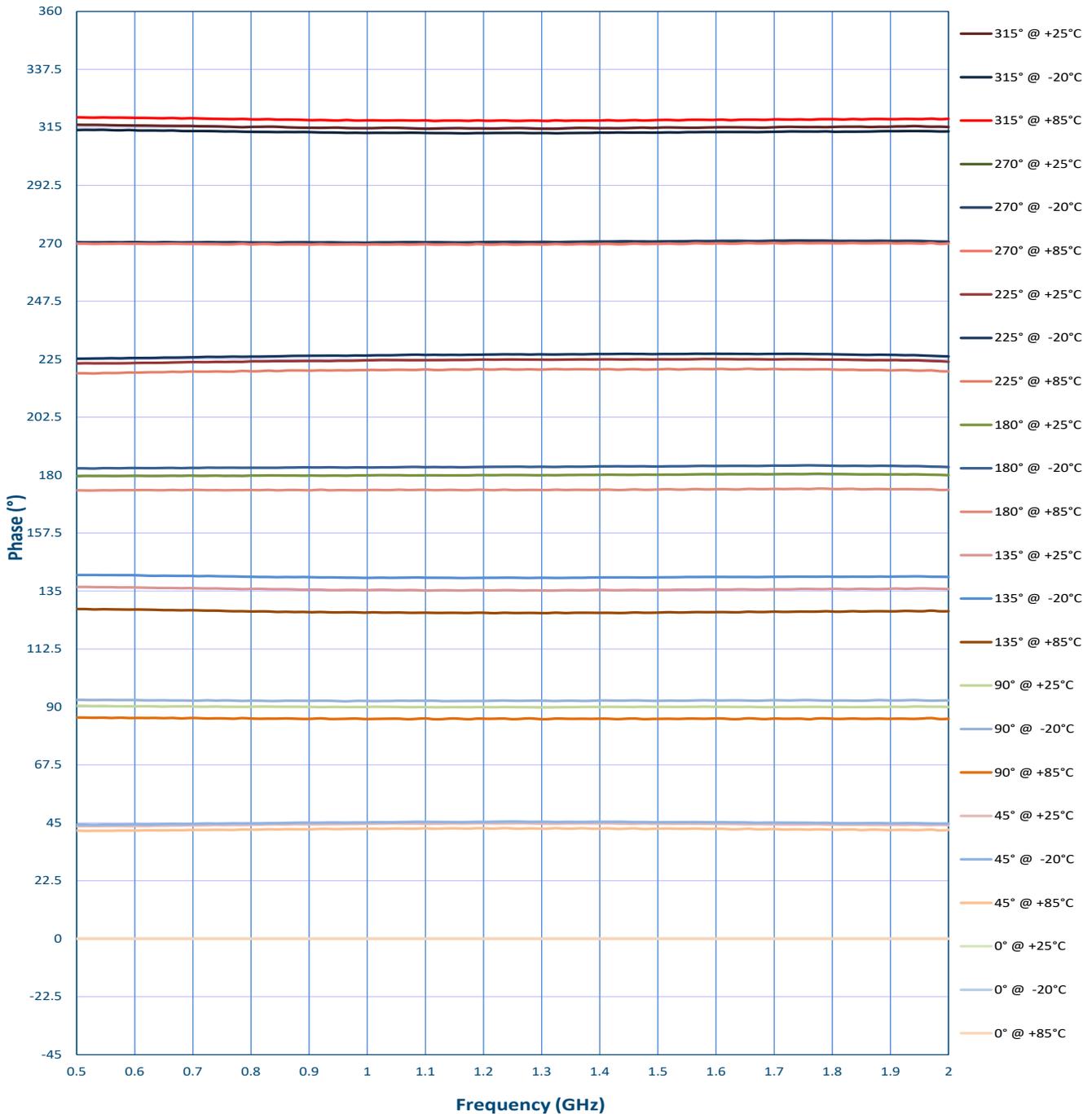


TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

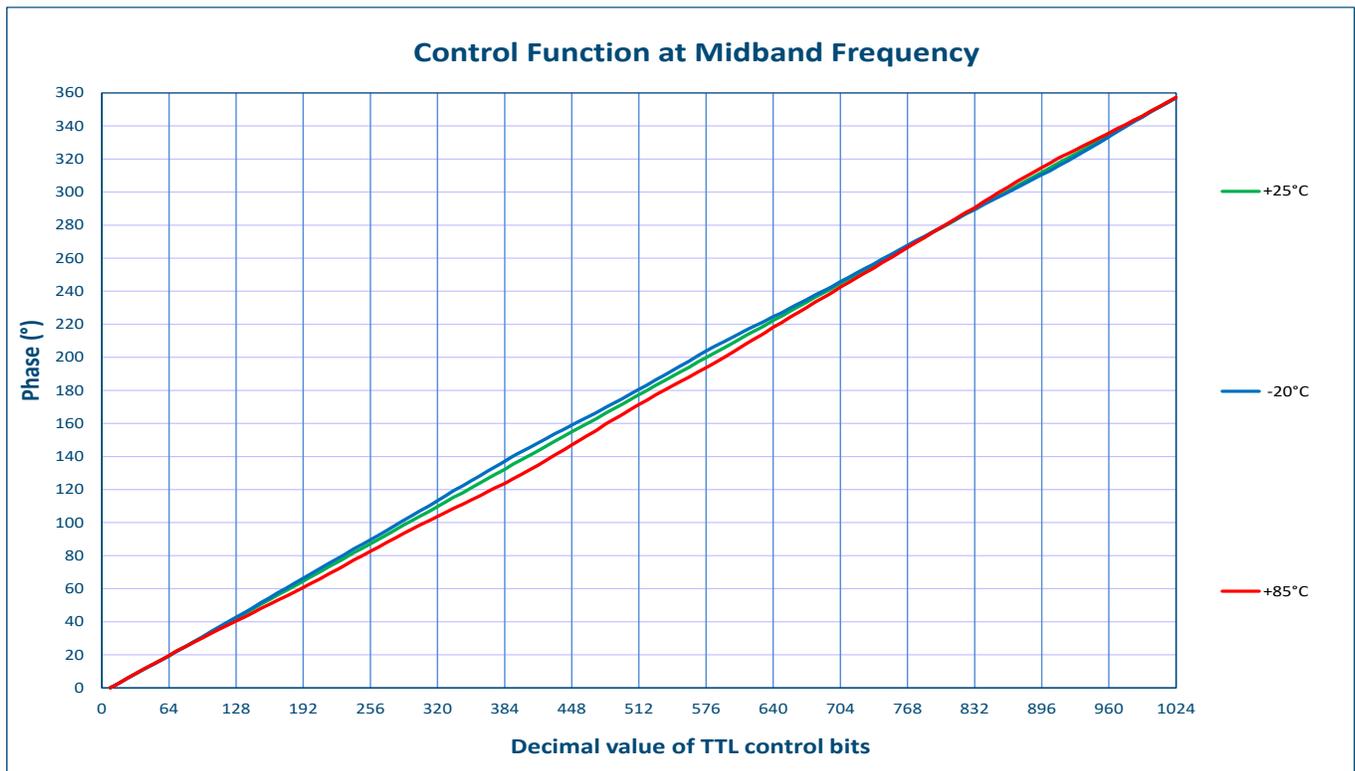
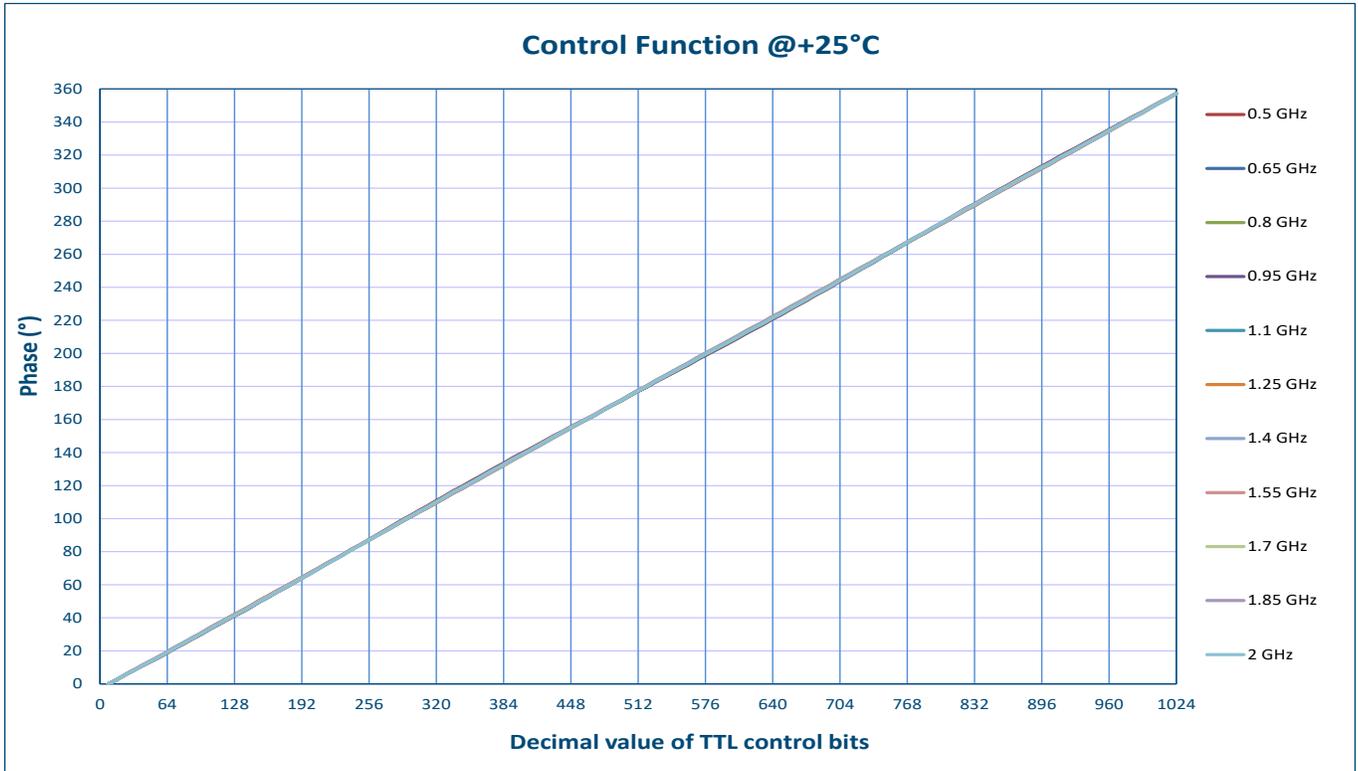


TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

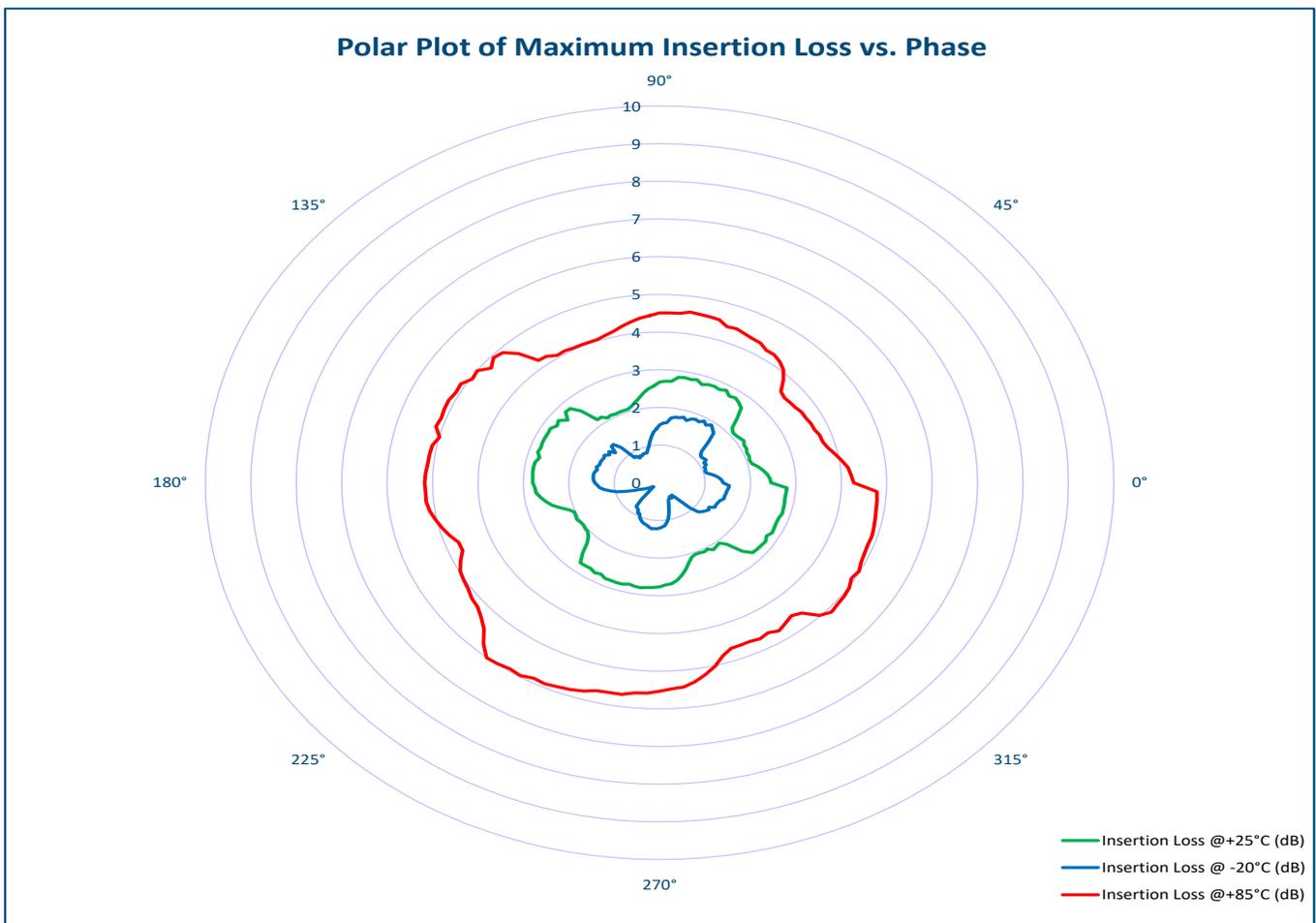
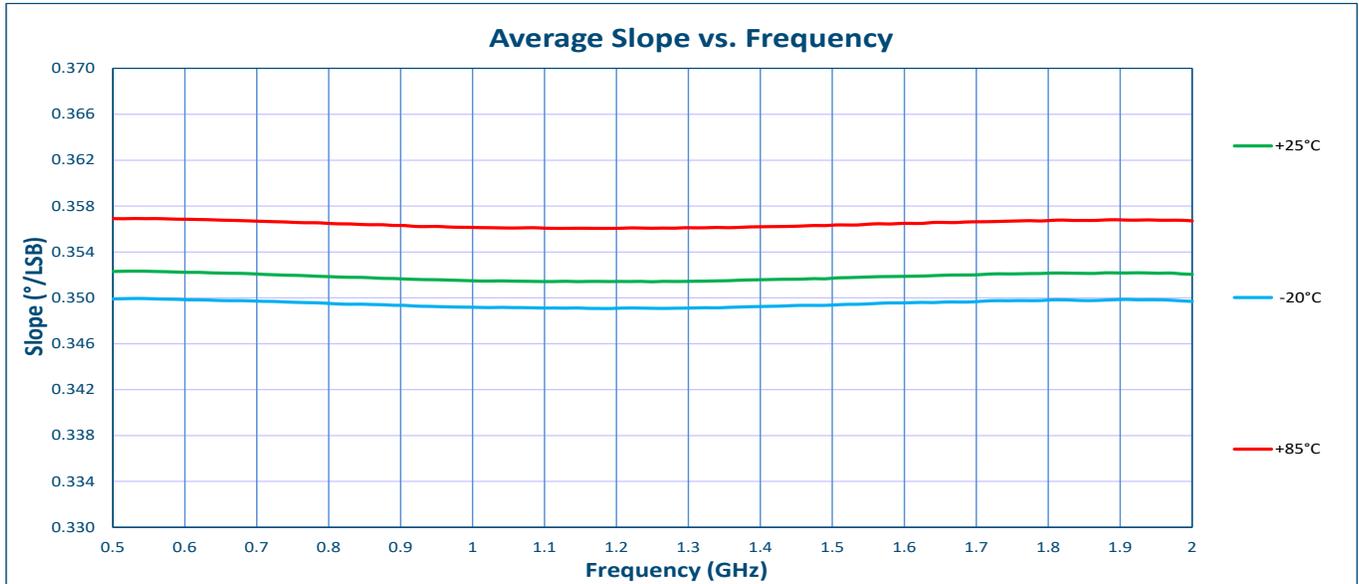
Phase Stability vs. Frequency at Selected Phase States



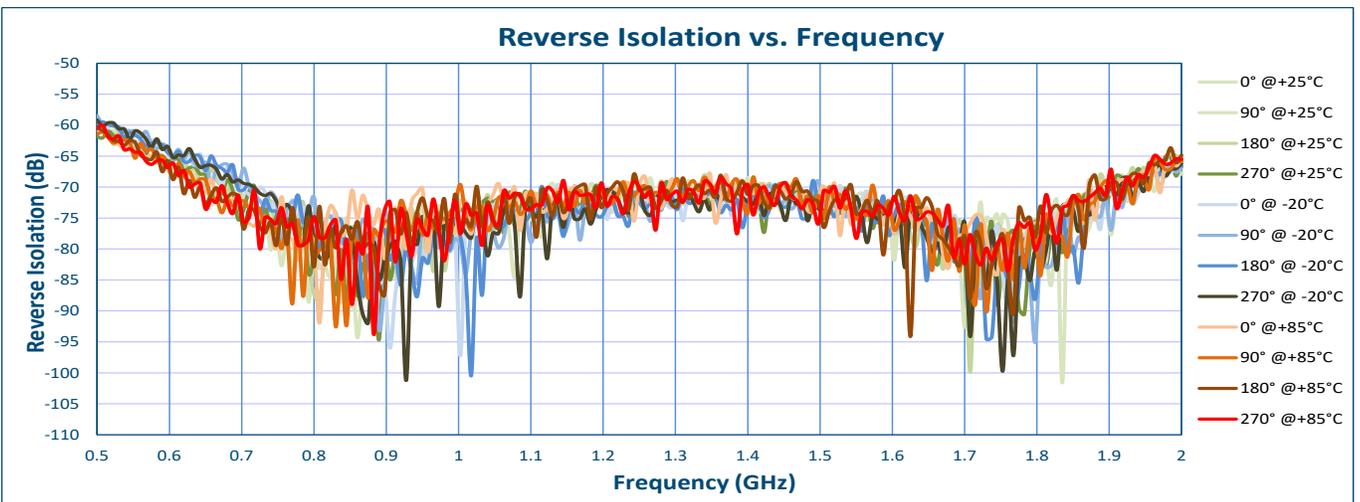
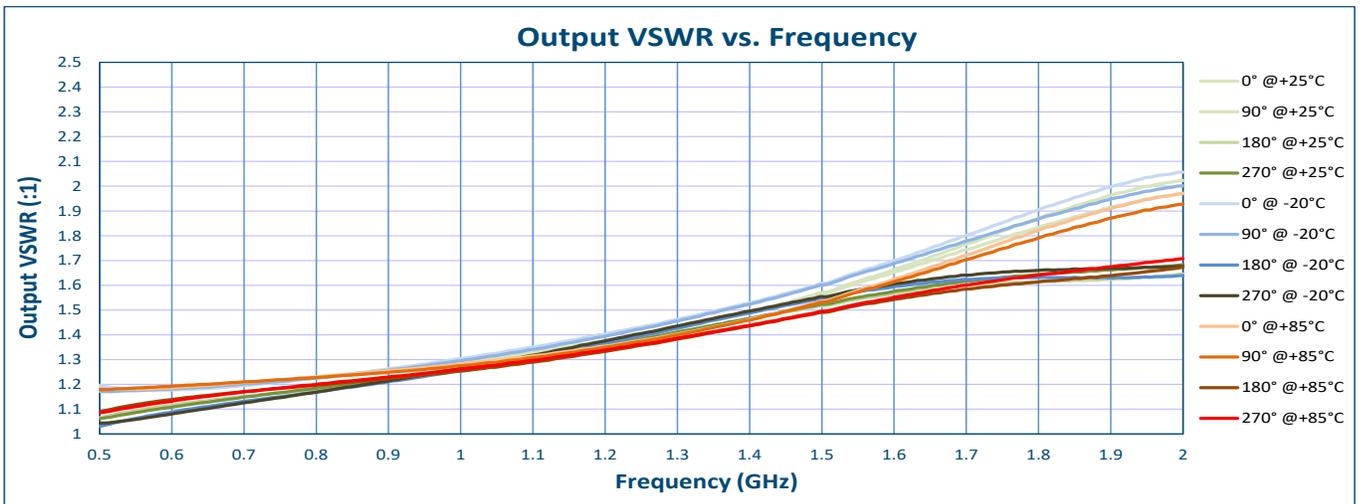
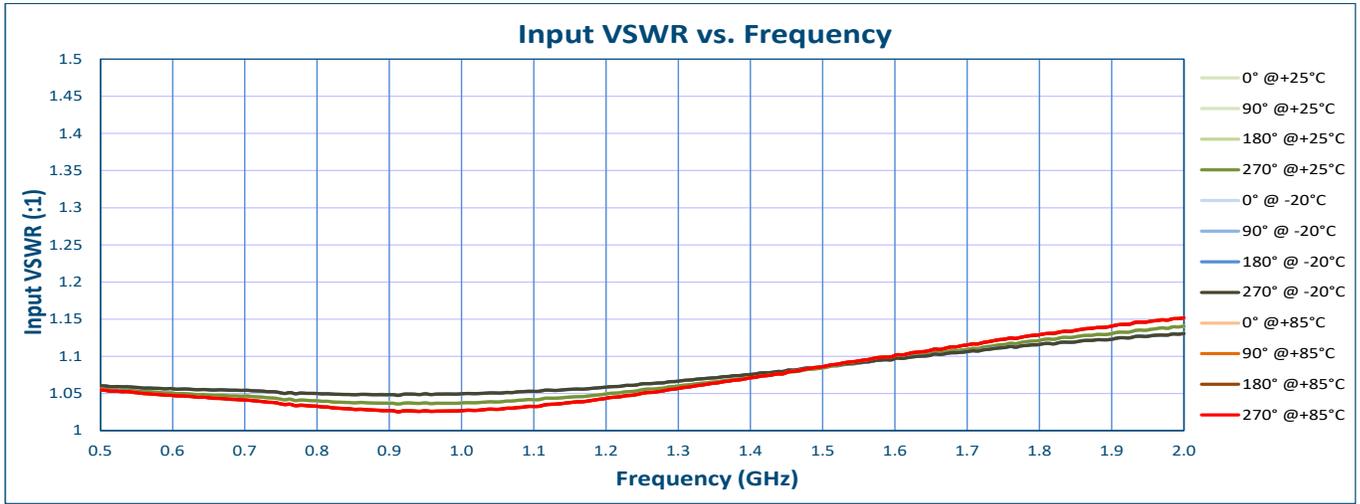
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



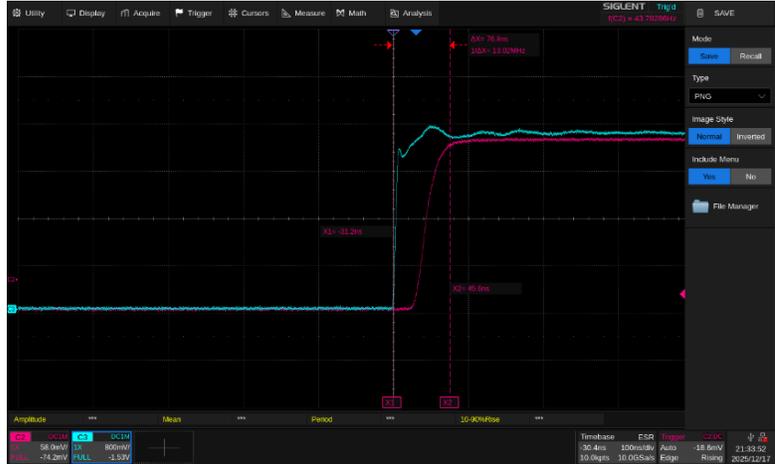
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM



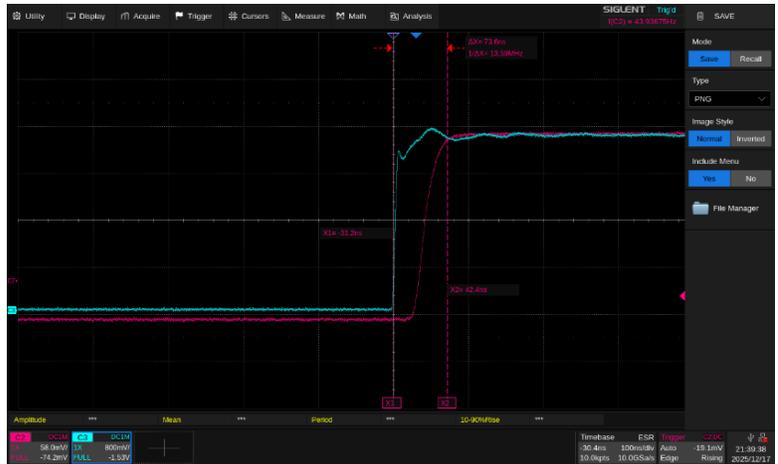
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

Switching Speed

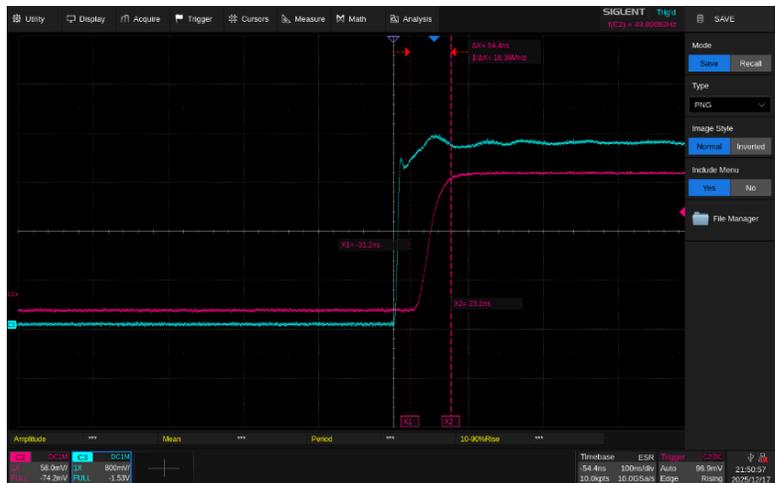
+25°C: 76.8 ns



-20°C: 73.6 ns



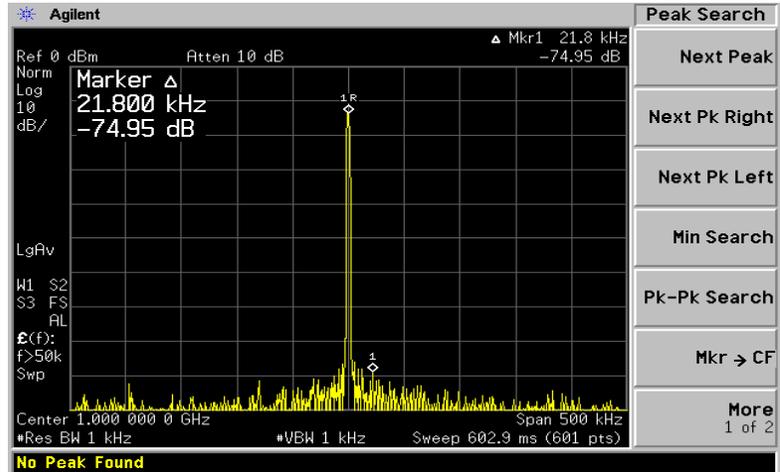
+85°C: 54.4 ns



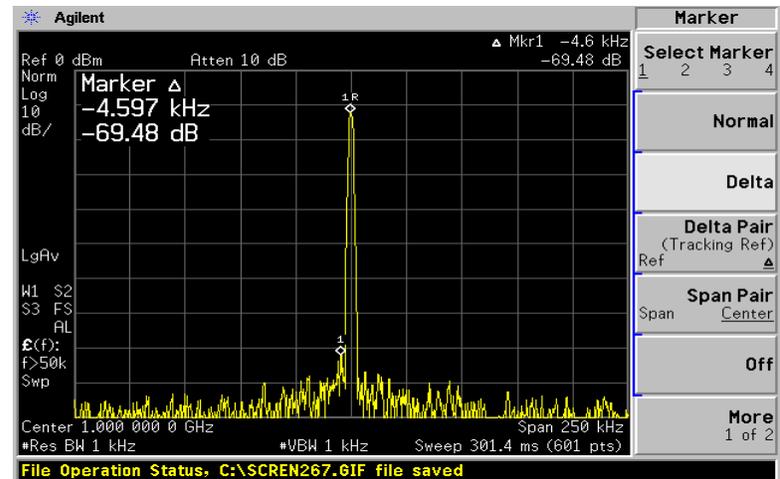
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

Spurious (narrow range)

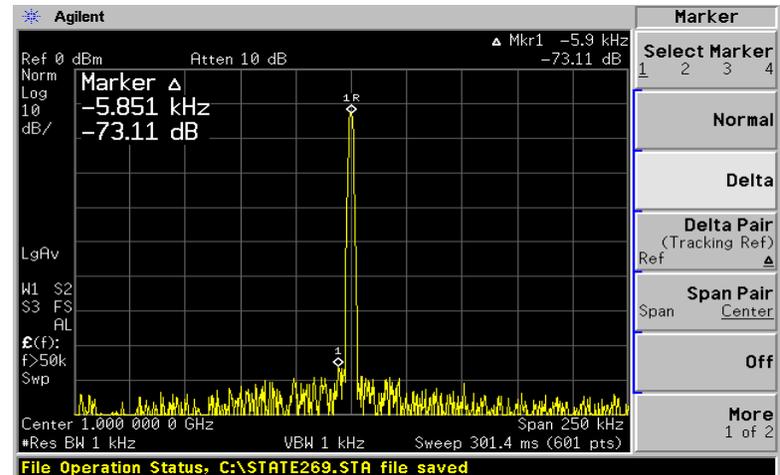
+25°C: -74.9 dBc



-20°C: -69.4 dBc



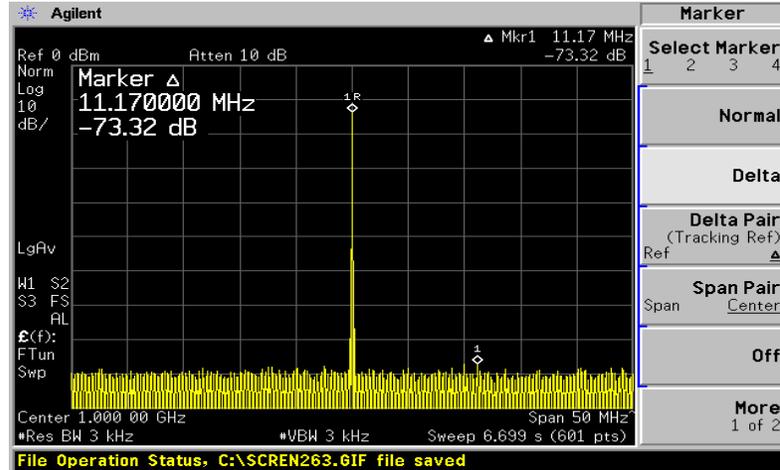
+85°C: -73.1 dBc



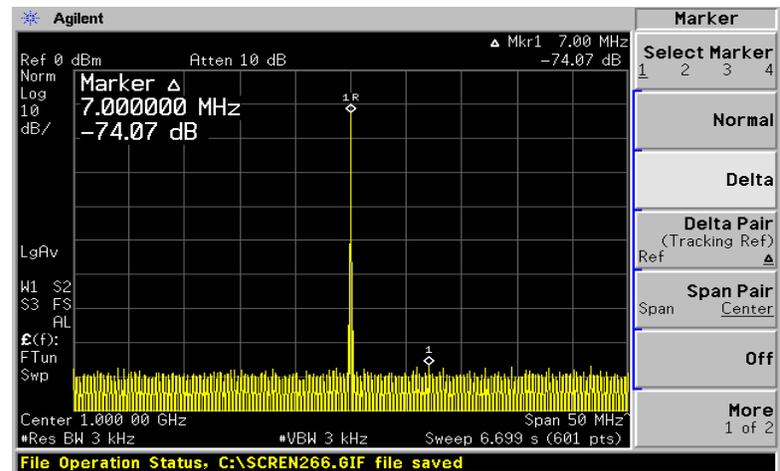
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

Spurious (broad range)

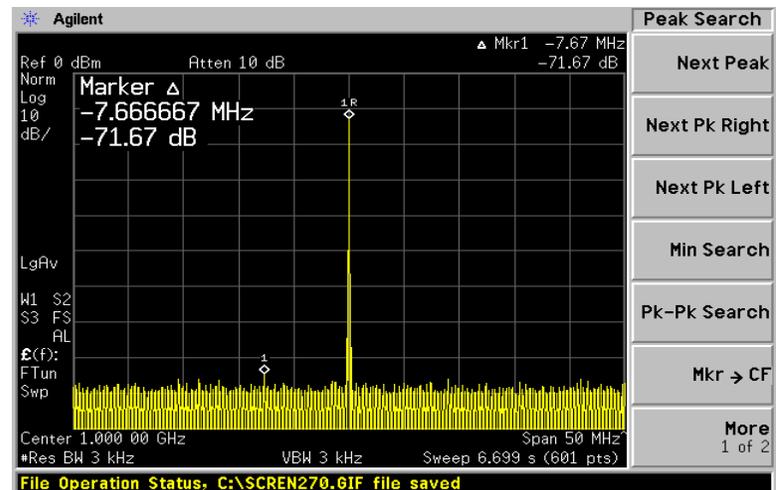
+25°C: -73.3 dBc



-20°C: -74.0 dBc



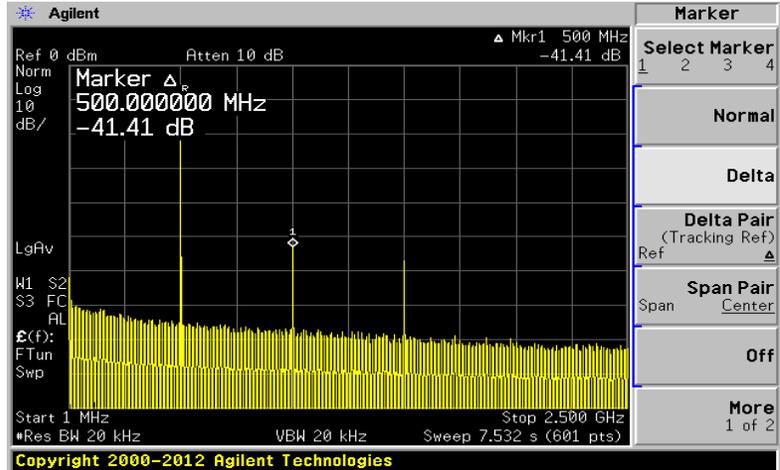
+85°C: -71.7 dBc



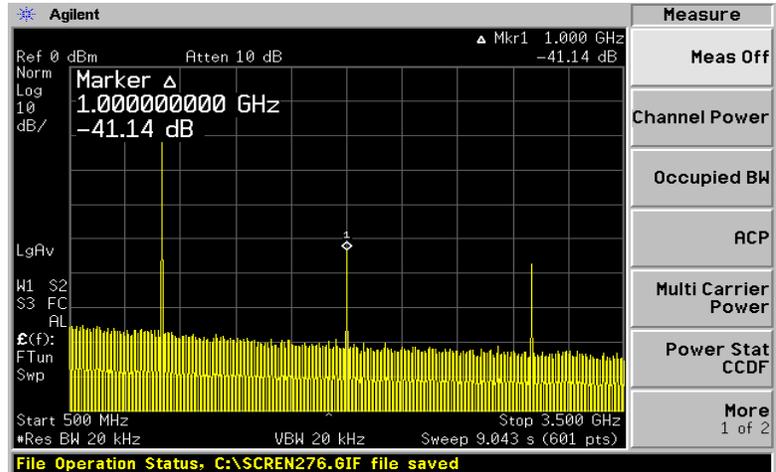
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

Harmonics @ +25°C

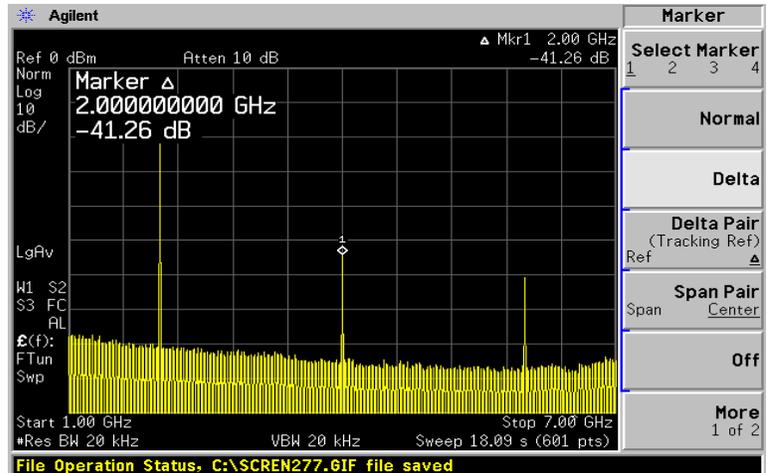
Carrier: 500 MHz



Carrier: 1 GHz



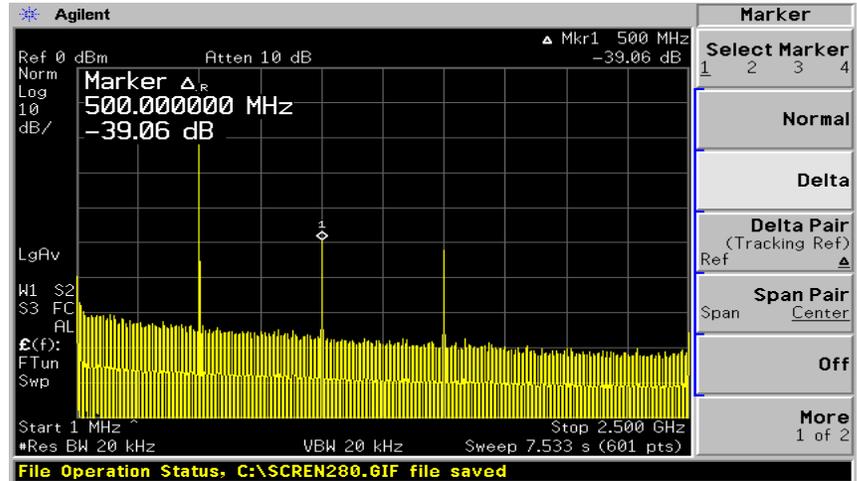
Carrier: 2 GHz



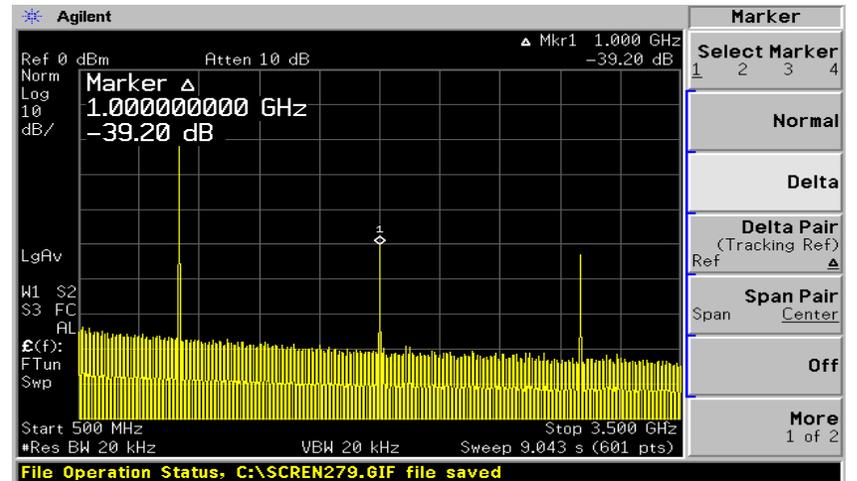
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

Harmonics @ -20°C

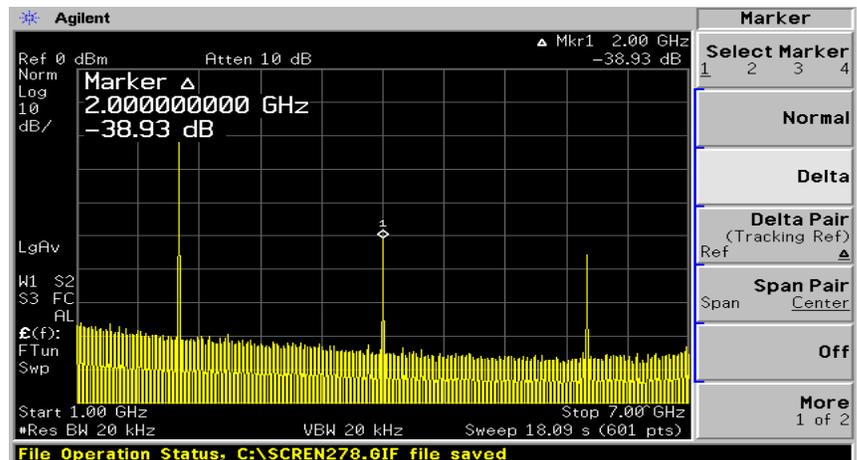
Carrier: 500 MHz



Carrier: 1 GHz



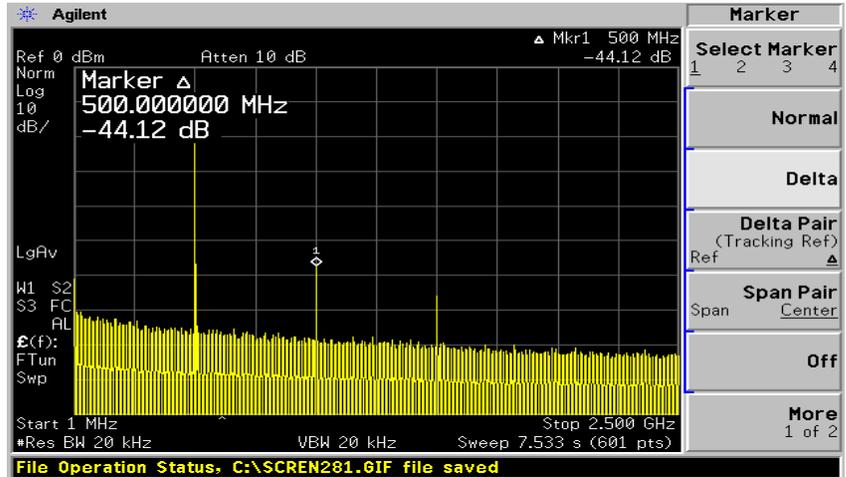
Carrier: 2 GHz



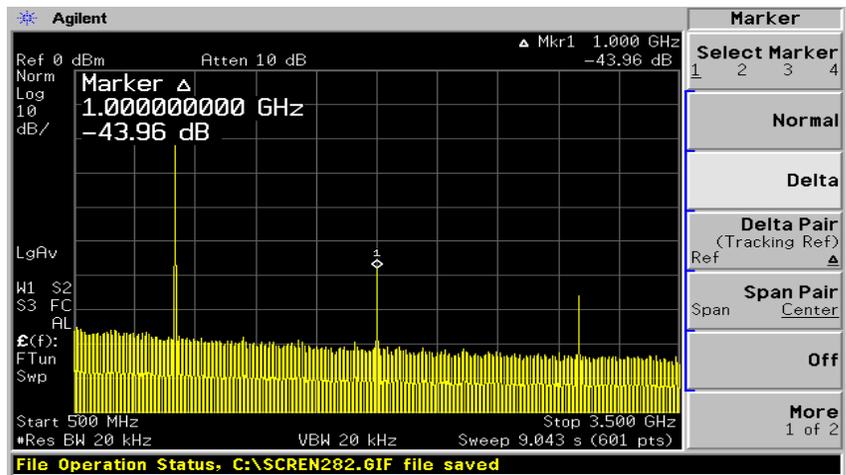
TYPICAL CHARACTERISTICS ON PS-500M2G-10B-SFF-MIL-SM

Harmonics @ +85°C

Carrier: 500 MHz



Carrier: 1 GHz



Carrier: 2 GHz

