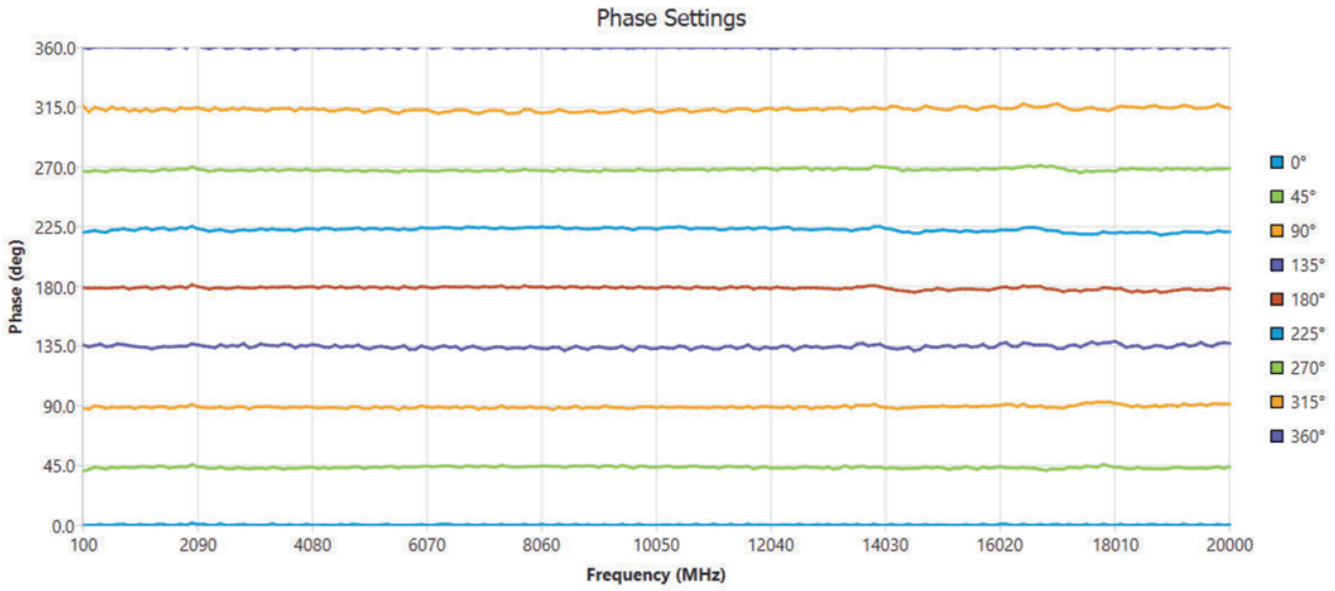
Applications for the PIQ-1-SMT broadband IQ vector modulator include:

- 5G/6G Communications
- Software Defined Transmission
- Beam Steering
- Wideband SATCOM
- Radar
- Electronic Warfare (EW)
- EW Threat Simulation
- Jamming
- Test & Measurement Front Ends
- Signal Generation
- Spectroscopy
- Quantum Computing

The following data depicts this product's use as an 8-bit digital phase shifter:



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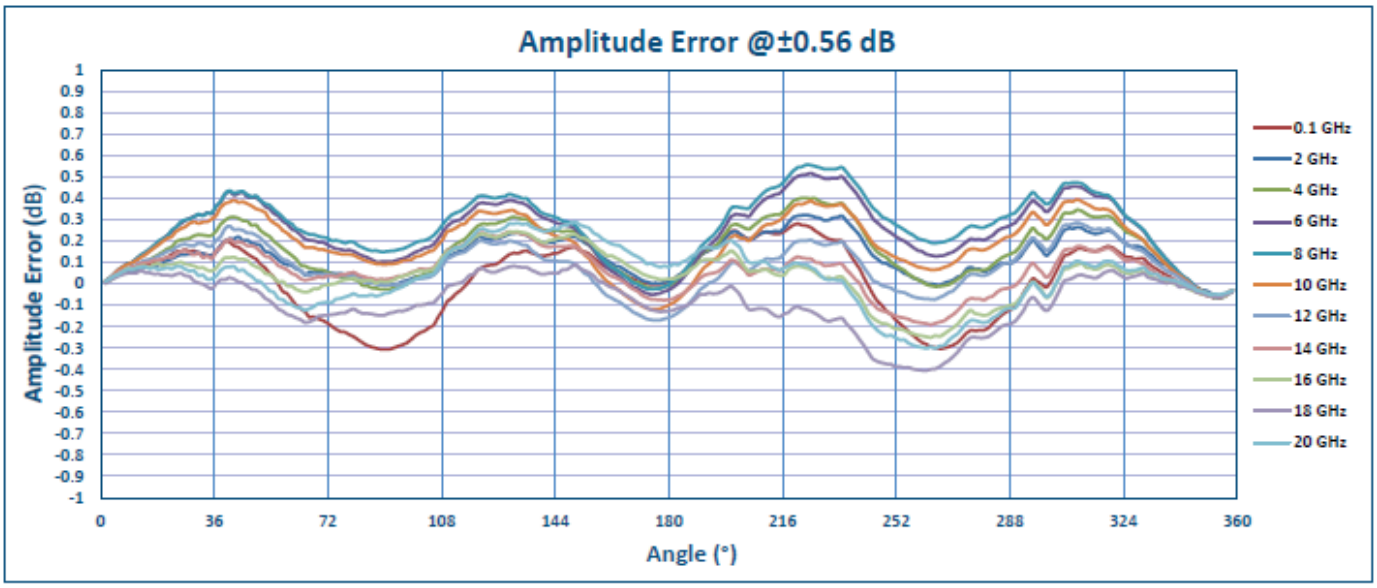

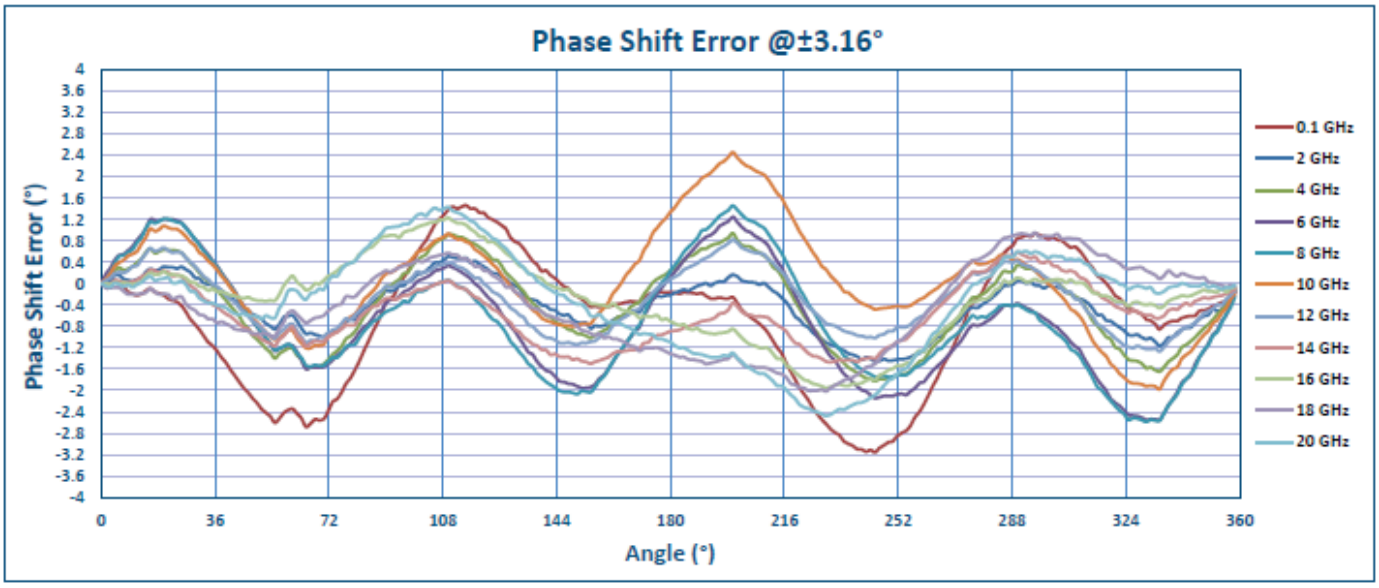

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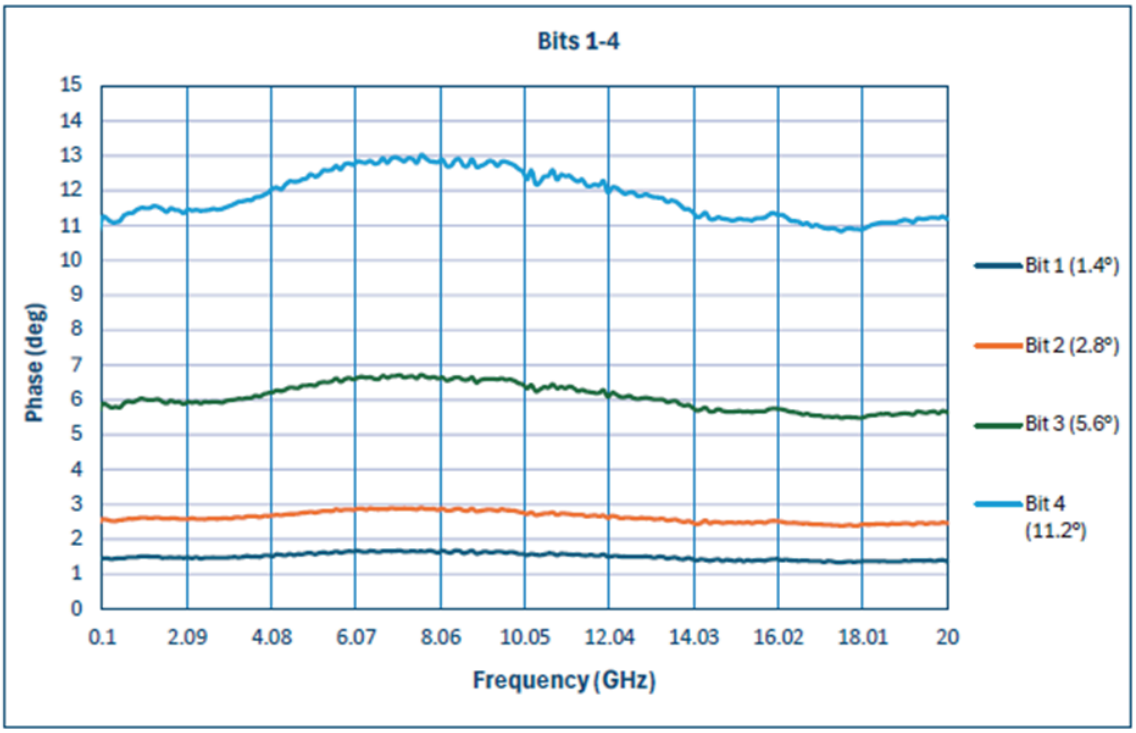

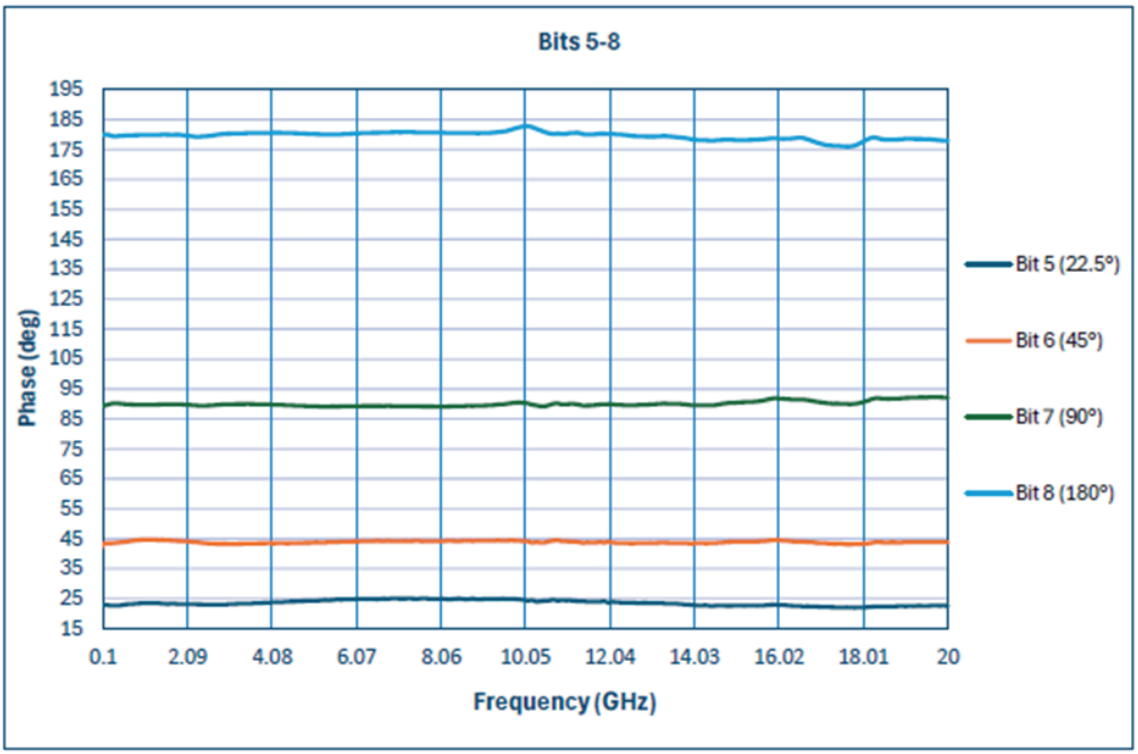

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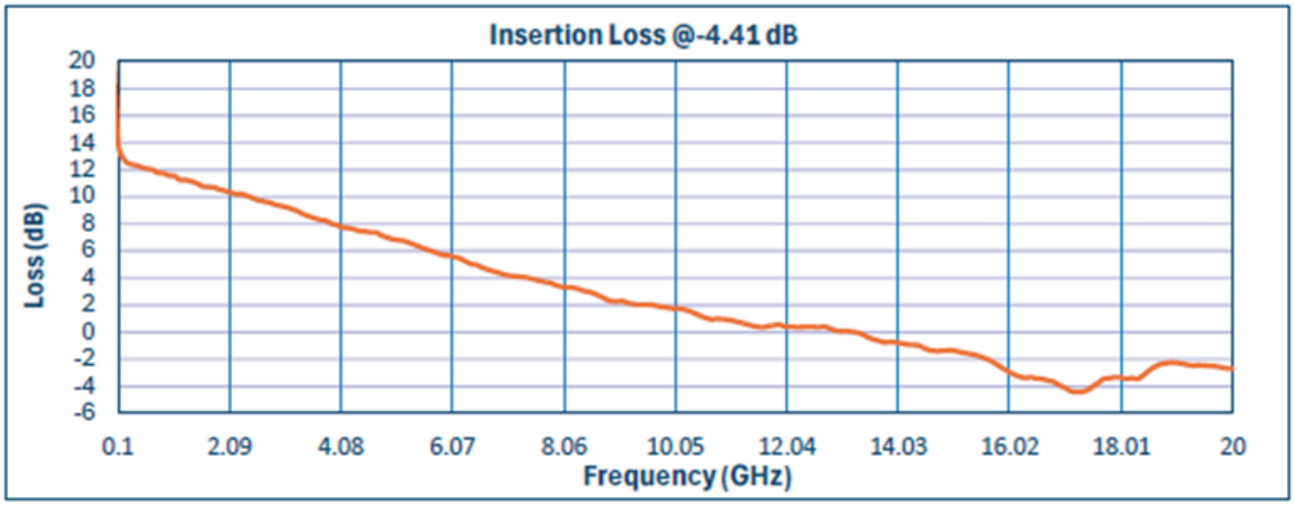

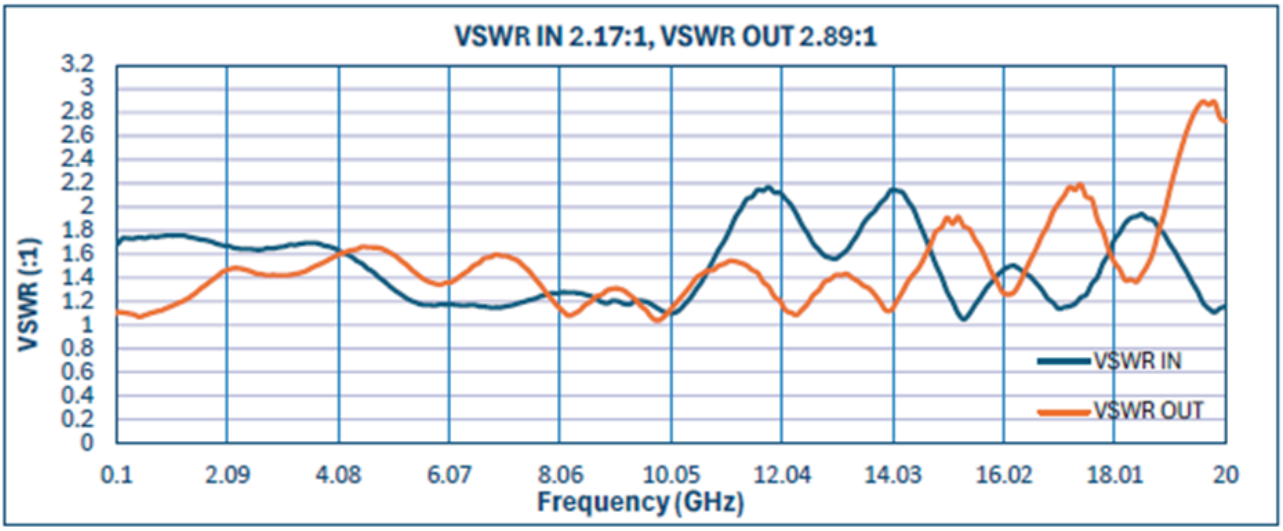

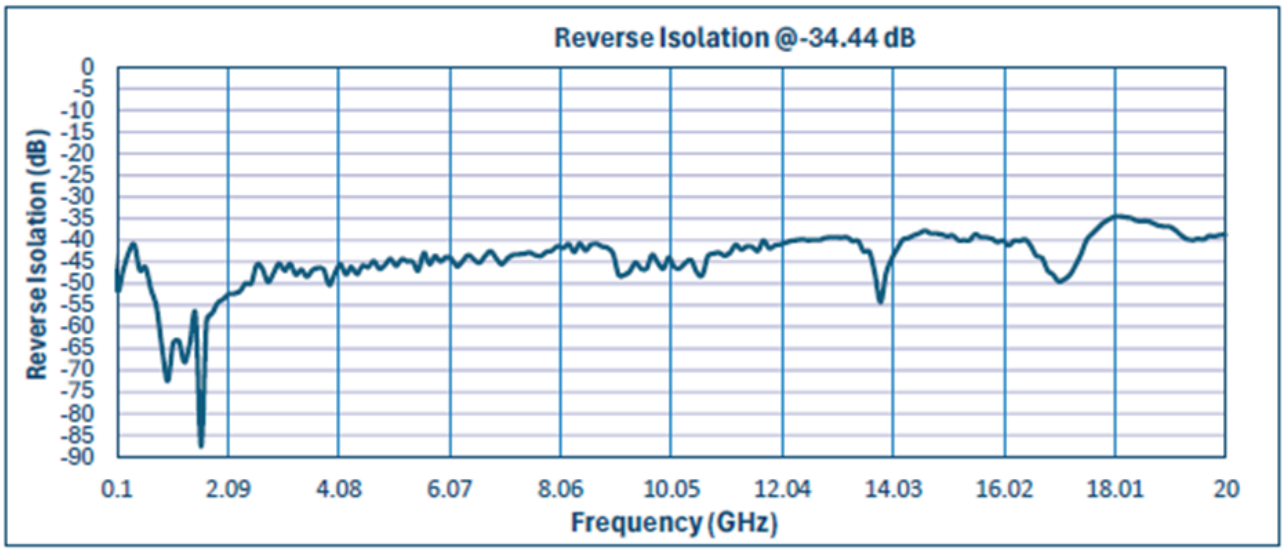

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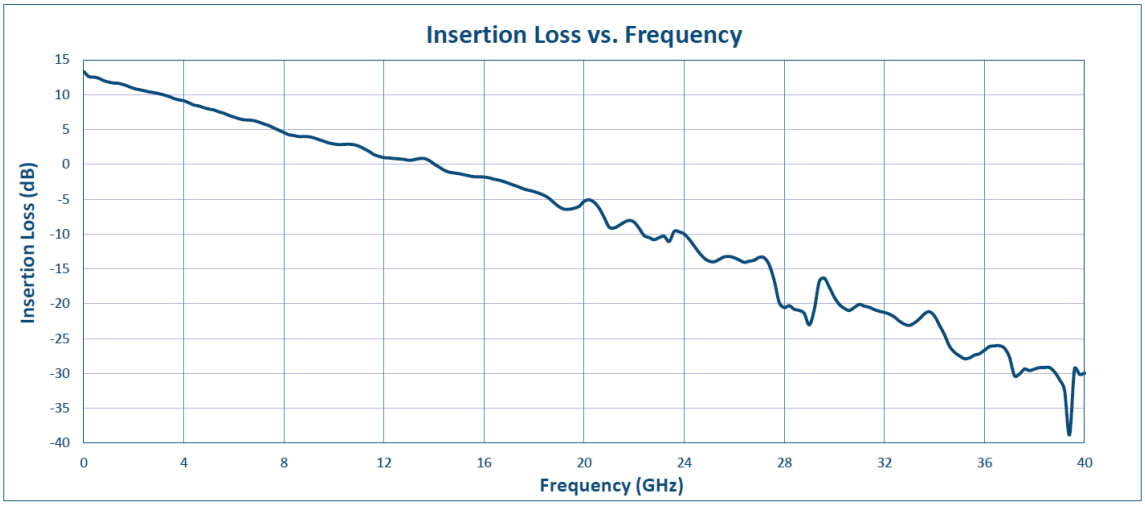

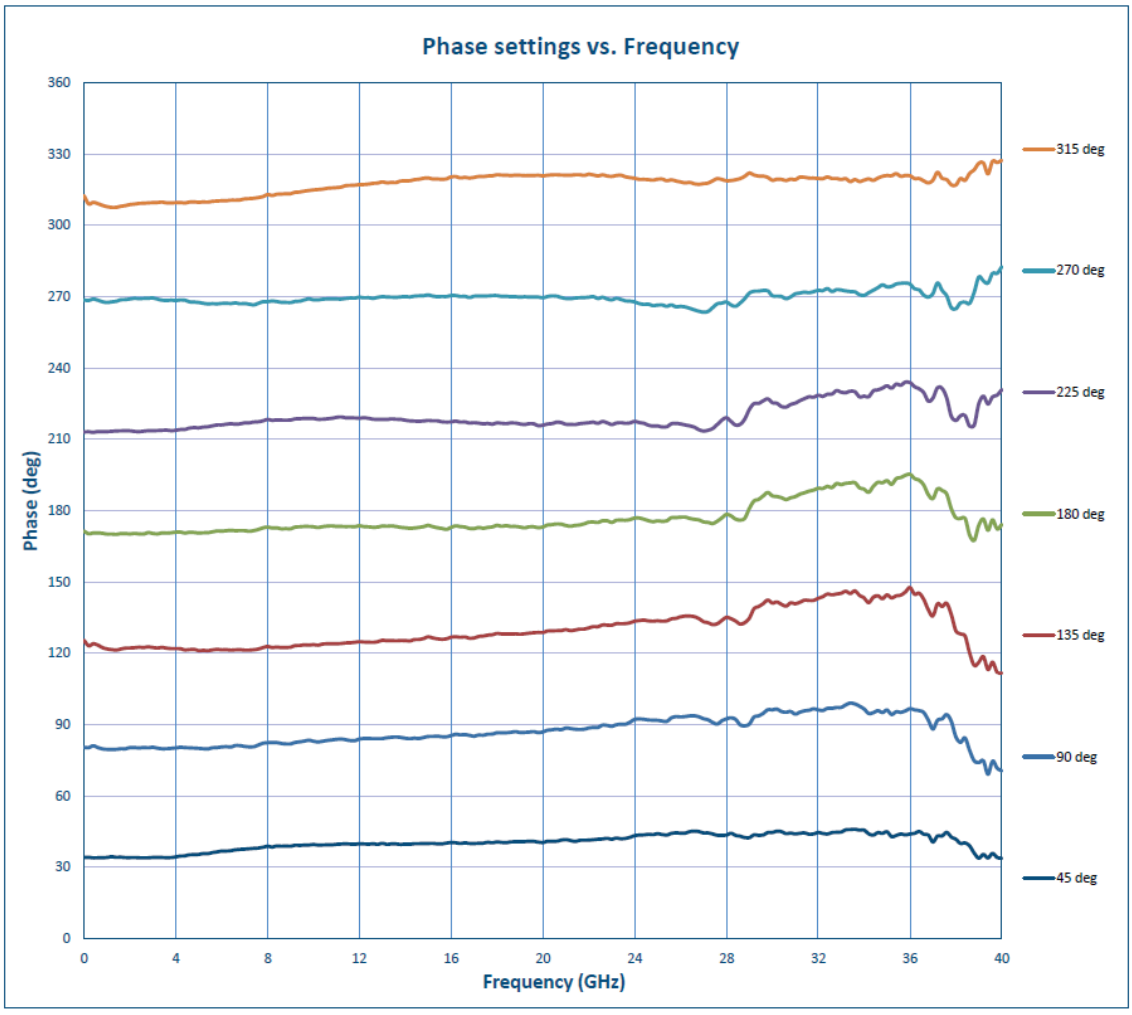

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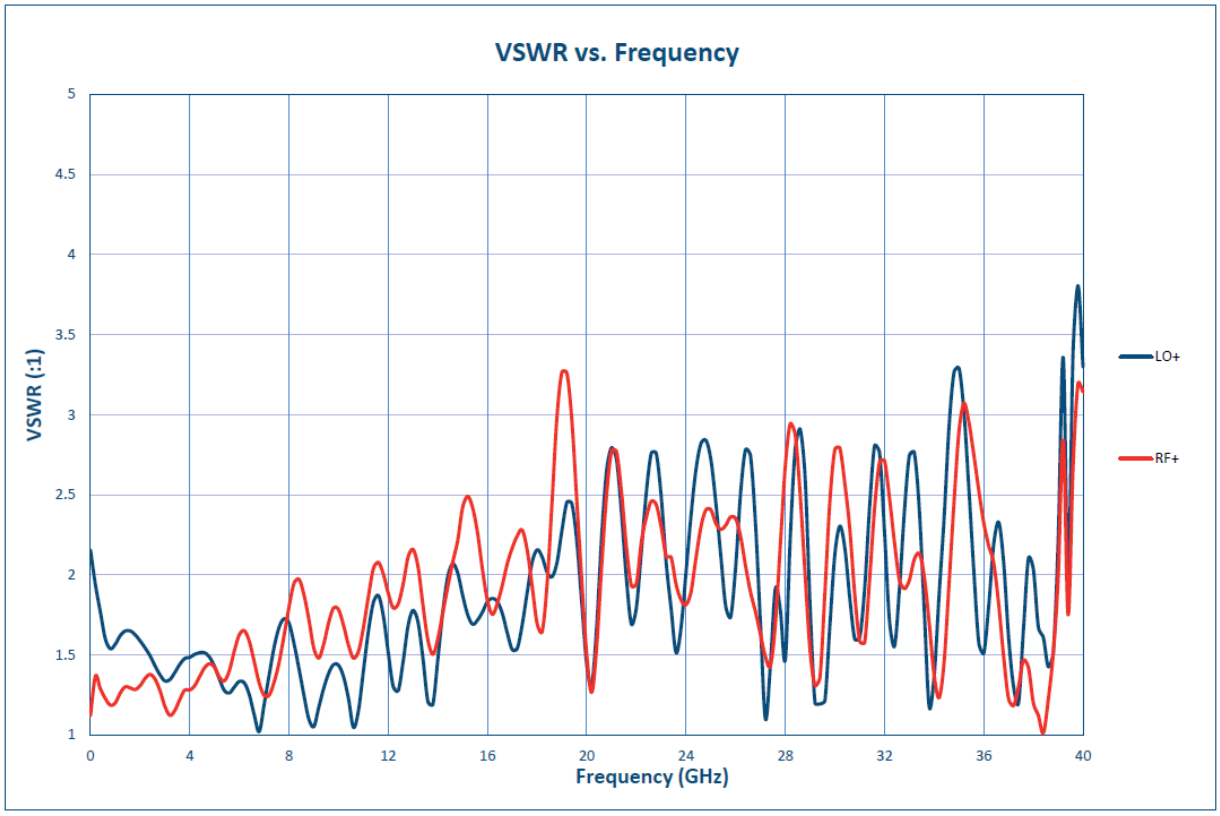

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REFLOW SOLDERING

The following guidelines are intended as a starting point for properly soldering this device to a circuit board. This section is not exhaustive, and we encourage users to develop their own process based on substrate material, solder type, etc. In general, do not allow devices to heat up or cool down too quickly. This could induce thermal stress capable of damaging the product. Based on the package thickness and volume, it is recommended to not exceed the maximum temperatures below.

Maximum Temperature	**SnPb Eutectic Process**	**Pb Free Process**
	235°C	**260°C**

Table 1: Classification Temperatures per IPC/JEDEC J-STD-020E

Below is a standard example of a reflow process from IPC/JEDEC J-STD-020E. We recommend referring to this example, IPC-7530, and your solder manufacturers recommendations to refine this process. Ultimately, a process that yields effective solder joints and does not damage devices is the goal and can vary based on several factors.

PROFILE FEATURE	SN-PB EUTECTIC ASSEMBLY	PB-FREE ASSEMBLY
Preheat/Soak Temperature Min (T_{smin}) Temperature Max (T_{smax}) Time (t_s) from (T_{smin} to T_{smax})	**100°C** **150°C** **60-120 seconds**	**150°C** **200°C** **60-120 second**
Ramp-up rate (T_L to T_p)	**3°C / second max.**	**3°C / second max.**
Liquidous temperature (T_L) Time (t_L) maintained above T_L	**183°C** **60-150 seconds**	**217°C** **60-150 seconds**
Peak package body temperature (T_P)	For users T_P must not exceed the Classification temp in Table 4-1. For suppliers T_P must equal or exceed the Classification temp in Table 4-1.	For users T_P must not exceed the Classification temp in Table 4-2. For suppliers T_P must equal or exceed the Classification temp in Table 4-2.
Time (t_P) within 5°C of the specified classification temperature (T_C)	**20* seconds**	**30* seconds**
Ramp-down rate (T_P to T_L)	**6°C / second max.**	**6°C / second max.**
Time 25°C to peak temperature	**6 minutes max.**	**8 minutes max.**

*Tolerance for peak profile temperature (T_P) is defined as a supplier minimum and a user maximum.

Table 2: Classification Profiles per IPC/JEDEC J-STD-020E

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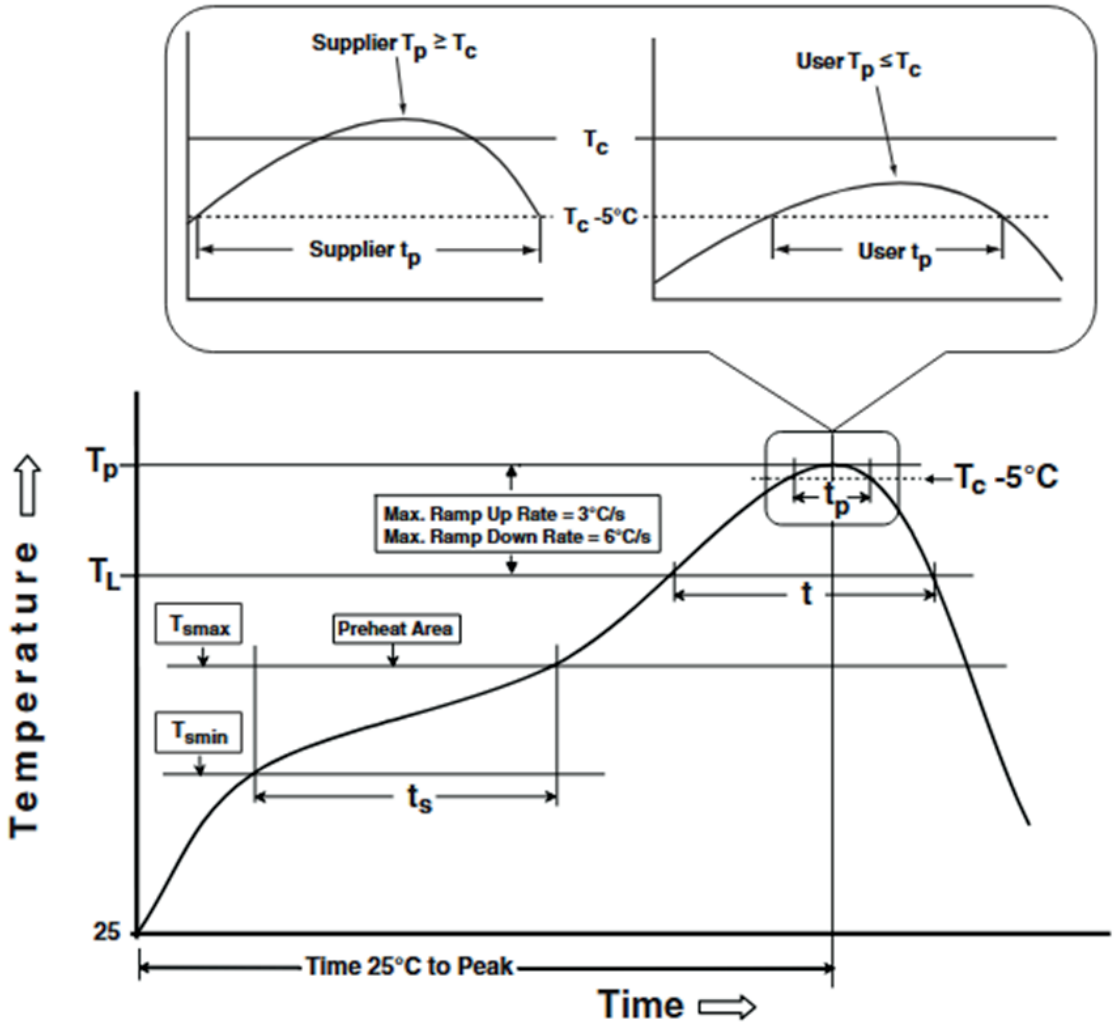

Figure 1: Classification Profile (not to scale) per IPC/JEDEC J-STD-020E

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