ABX0618M Data Sheet

Wide Band Power Amplifier MMIC

1. Product Overview

1.1 General Description

ABX0618M is a three-stage internally matched MMIC Power Amplifier which operates between 6.0 GHz and 18.0 GHz wide band frequency range. This product is well suited to radar and VSAT applications.

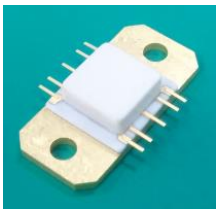
1.2 Features

- Frequency Range: 6.0 – 18.0 GHz
- Saturated Output Power: 31 dBm
- Small Signal Gain: 25 dB
- Bias: VDD = +7 V, IDD = 700 mA, VGG = -0.87 V (Typical)
- 100% DC and RF tested

1.3 Applications

- C, X, Ku Band VSAT
- Point to Point Radio

1.4 Package Profile & RoHS Compliance

	RoHS-compliant GREEN Package
10-lead Flange Package	RoHS-compliant

2. Summary on Product Performances

2.1 Typical Performance

Test conditions : T = +25 °C, VDD = +7 V, CW, Z_O = 50 Ω.

Parameters	Test Conditions	Min	Typ	Max	Units
Gate Bias Voltage	*f* = 6.0 - 18.0 GHz		-0.87		V
Output Power at Psat[1)]	*f* = 6.0 - 18.0 GHz		31		dBm
Small signal gain	*f* = 6.0 - 18.0 GHz		25		dB
Input Return Loss	*f* = 6.0 - 18.0 GHz		-10		dB
Output Return Loss	*f* = 6.0 - 18.0 GHz		-5		dB
Supply Current	VDD = +7 V		700		mA

1) Psat: Saturated output power

2.2 Product Specification

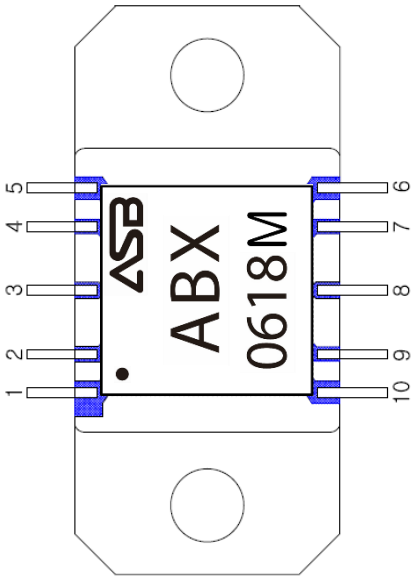
Test conditions : T = +25 °C, VDD= +7 V, CW, VGG = -0.87 V typical, Z_O = 50 Ω.

Parameter	Min	Typ	Max	Unit
Frequency	6.0		18.0	GHz
Small Signal Gain		25		dB
Input Return Loss		-10		dB
Output Return Loss		-5		dB
Supply Current		700		mA

2.3 Absolute Maximum Ratings

Parameters	Max. Ratings
Operating Case Temperature (Tc)	-40 to +85 °C
Storage Temperature (Tstg)	-55 to +125 °C
Drain Voltage (VDD)	+8 V
Gate Voltage (VGG)	-1.5 to -0.5 V
Input RF Power (Pin)	18 dBm

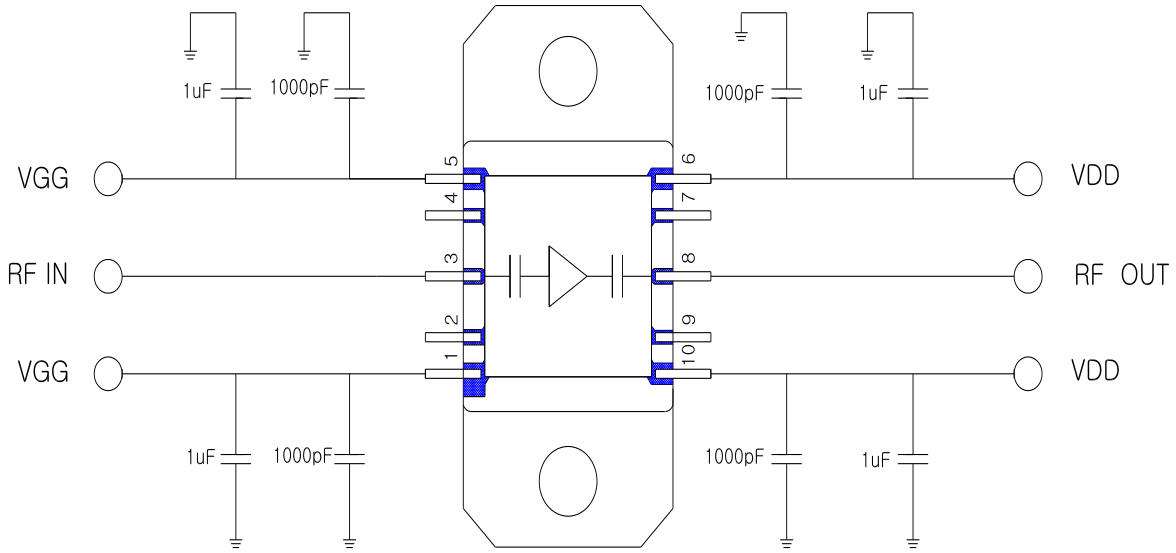
2.4 Pin Descriptions



Pin	Pin Name	Description
1,5	Vg	Gate voltage
3	RF IN	Input, matched to 50 ohms
6,10	Vd	Drain voltage
8	RF OUT	Output, matched to 50 ohms
2,4,7,9	NC	No internal connection (open or connected to GND)

3. Application: 6.0 – 18.0 GHz

3.1 Application Circuit



Note 1: The capacitors are recommended on the bias supply line, close to the package, in order to prevent video oscillations which could damage the module.

3.2 Biasing Procedure

- Make sure no RF power is applied to the device before continuing.
- Pinch off device by setting VGG to -1.5 V.
- Raise VDD to +7 V while monitoring drain current.
- Raise VGG until drain current reaches 0.7 A. VGG should be between -1.5 and -0.5 V.
- Apply RF power.
- To improve the thermal and RF performance, ASB recommends a heat sinker attached to the bottom of the package with an Indium alloy preform.

3.3 Performance Table

Test conditions : T = +25 °C, VDD = +7 V, CW, Z_O = 50 Ω.

Parameters	Test Conditions	Min	Typ	Max	Units
Gate Bias Voltage	*f* = 6.0 - 18.0 GHz		-0.87		V
Output Power at Psat[1)]	*f* = 6.0 - 18.0 GHz		31		dBm
Small signal gain	*f* = 6.0 - 18.0 GHz		25		dB
Input Return Loss	*f* = 6.0 - 18.0 GHz		-10		dB
Output Return Loss	*f* = 6.0 - 18.0 GHz		-5		dB
Supply Current	VDD = +7 V		700		mA

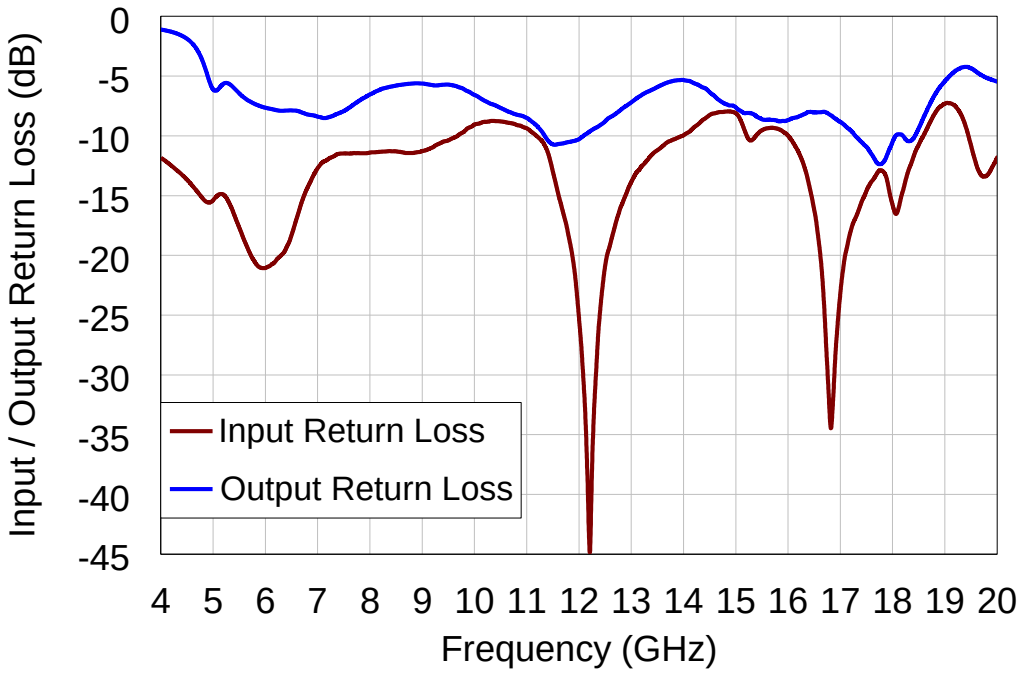
1) Psat: Saturated output power

3.4 Plots of Performances

S-parameter

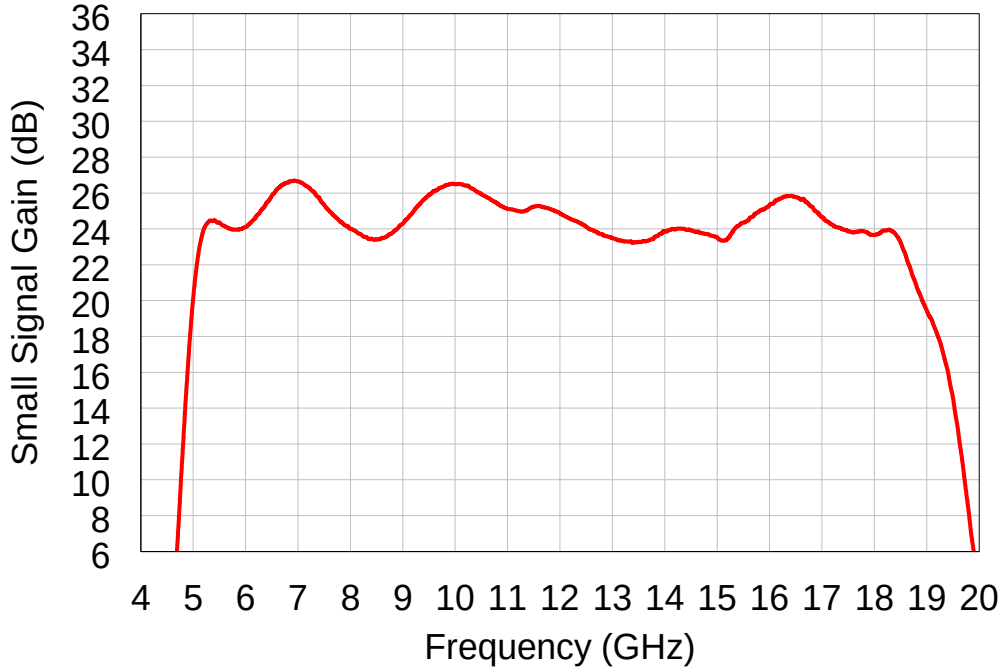
Input / Output Return Loss vs. Frequency

VDD = +7 V, IDD = 700 mA, Pin = -20 dBm



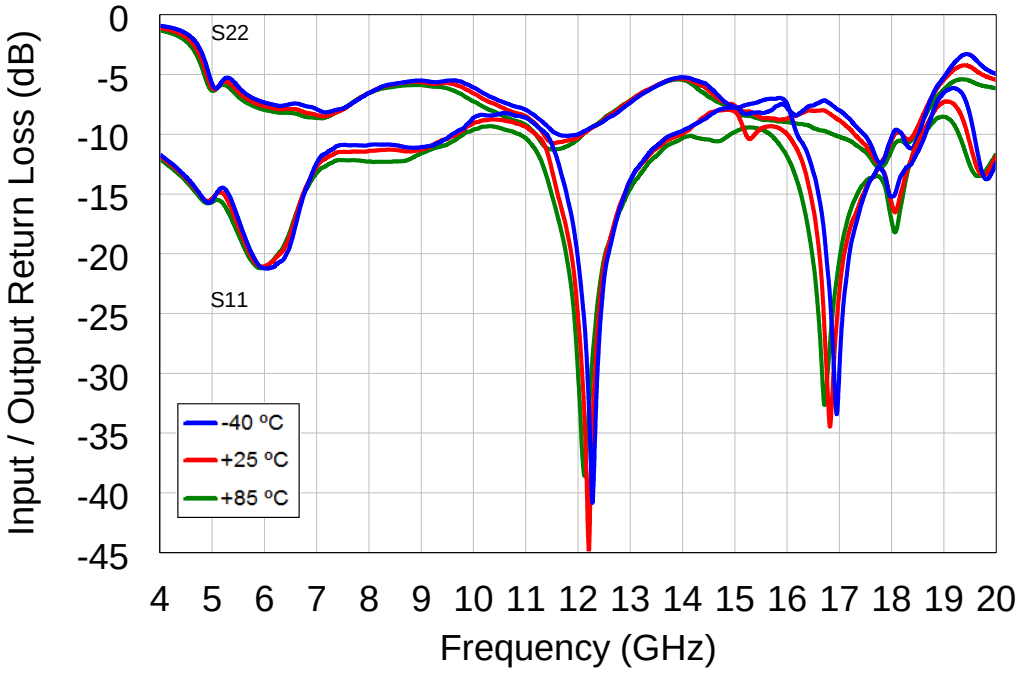
Small Signal Gain vs. Frequency

VDD = +7 V, IDD = 700 mA, Pin = -20 dBm



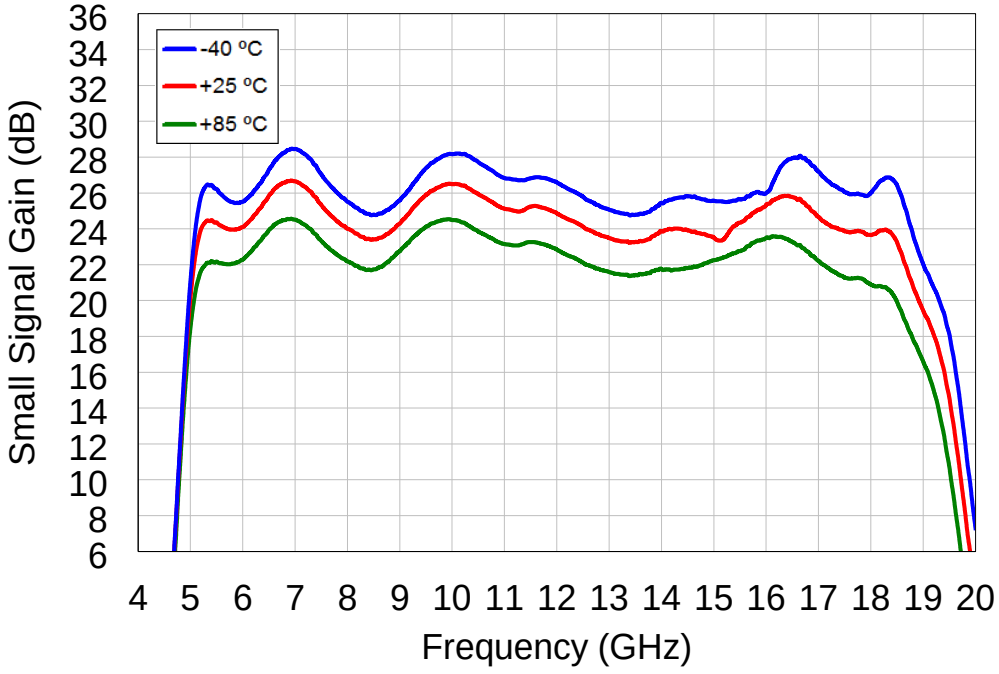
Input / Output Return Loss vs. Frequency

VDD = +7 V, IDD = 700 mA, Pin = -20 dBm



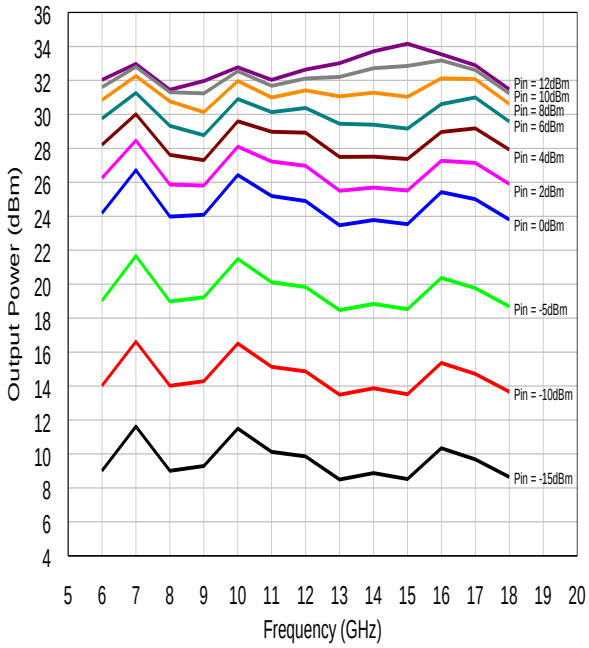
Small Signal Gain vs. Frequency

VDD = +7 V, IDD = 700 mA, Pin = -20 dBm



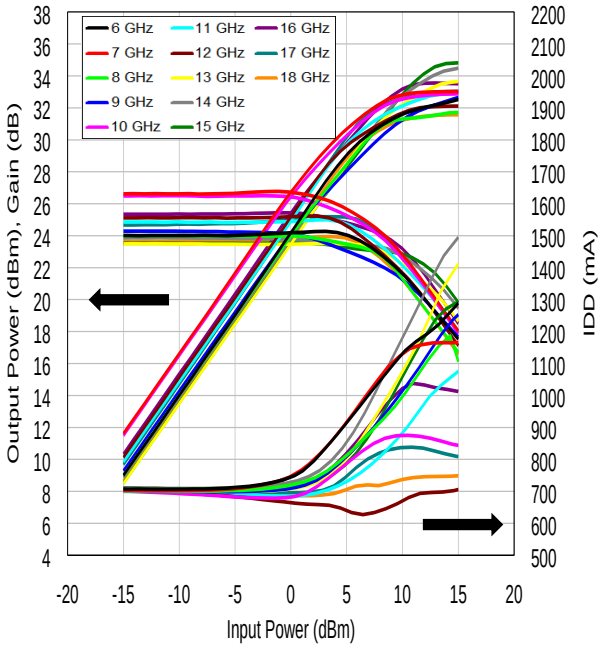
Output Power vs. Frequency

VDD = +7 V, IDD = 700 mA



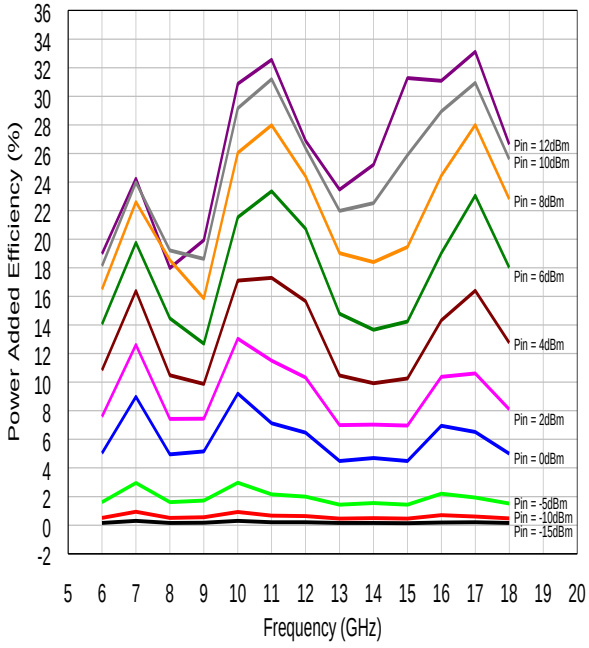
Output Power, IDD, Gain vs. Input Power

VDD = +7 V, IDD = 700 mA



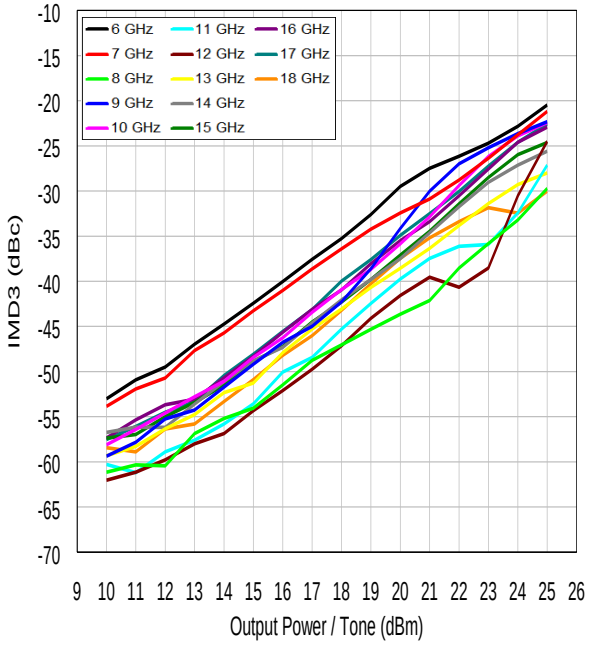
Power Added Efficiency vs. Frequency

VDD = +7 V, IDD = 700 mA



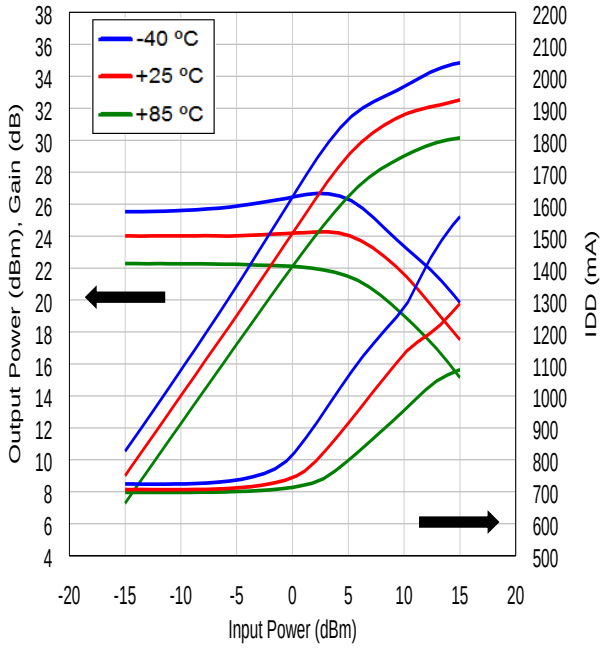
IMD3 vs. Output Power / Tone

VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

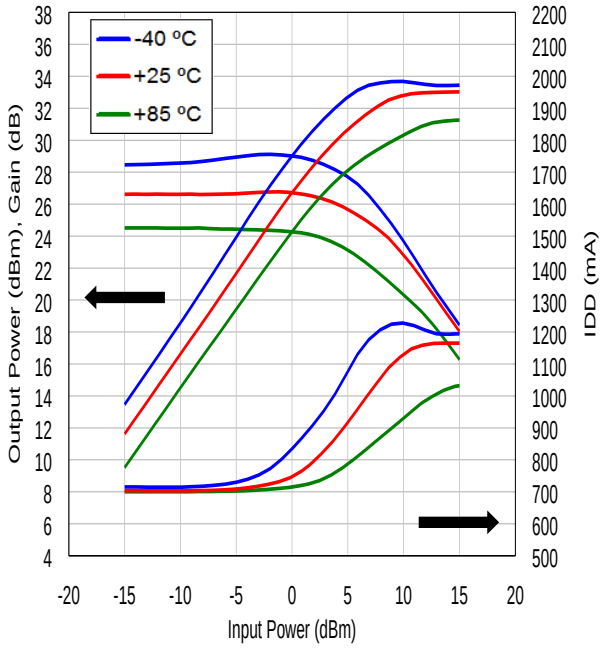


Output Power, Drain Current, Gain vs. Input Power

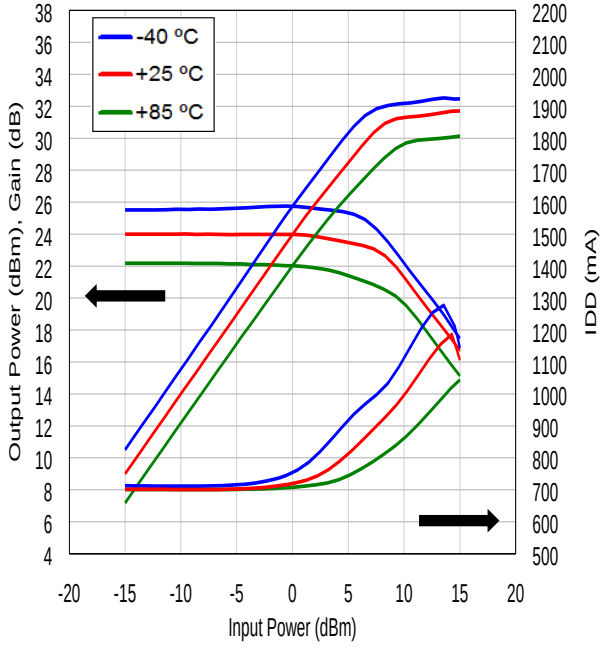
VDD = +7 V, IDD = 700 mA @ 6 GHz



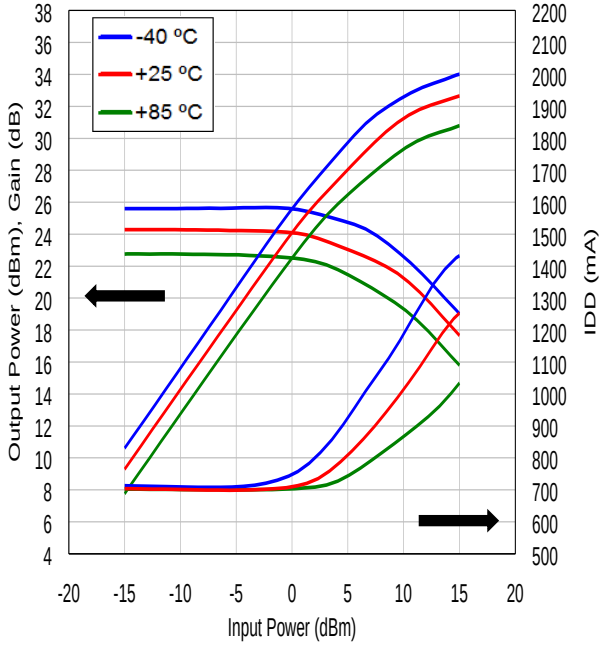
VDD = +7 V, IDD = 700 mA @ 7 GHz



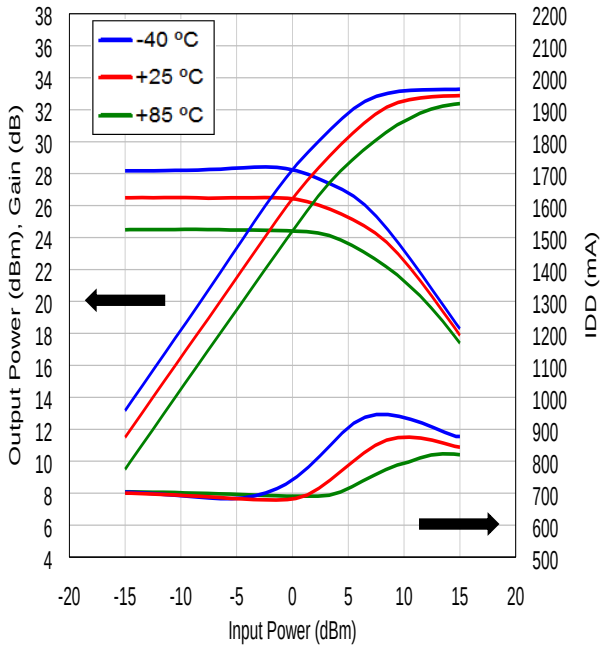
VDD = +7 V, IDD = 700 mA @ 8 GHz



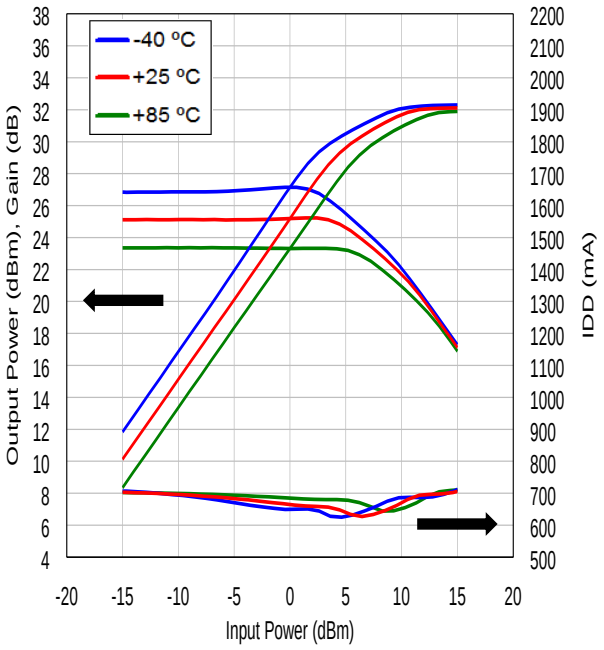
VDD = +7 V, IDD = 700 mA @ 9 GHz



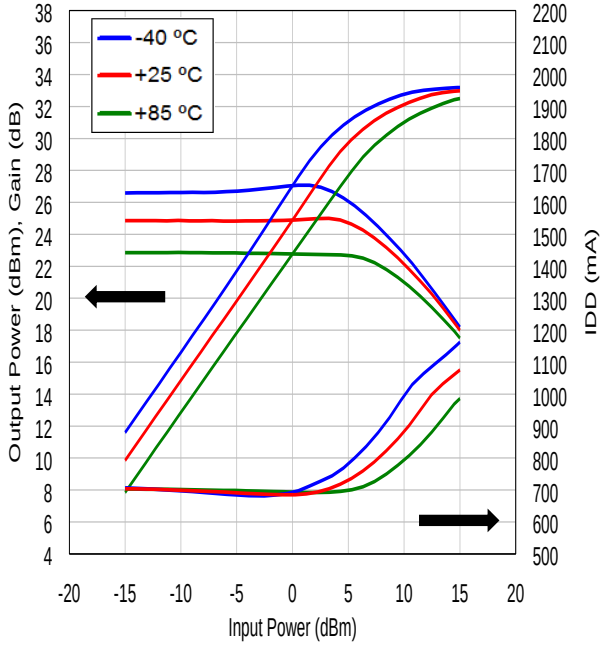
VDD = +7 V, IDD = 700 mA @ 10 GHz



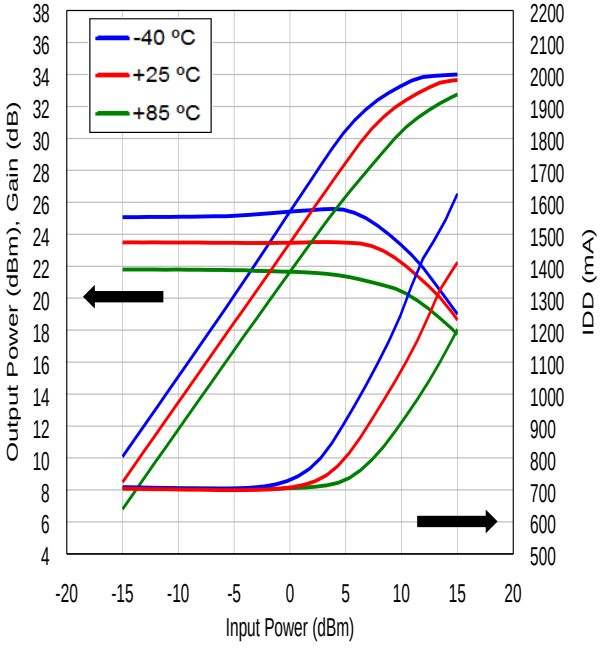
VDD = +7 V, IDD = 700 mA @ 11 GHz



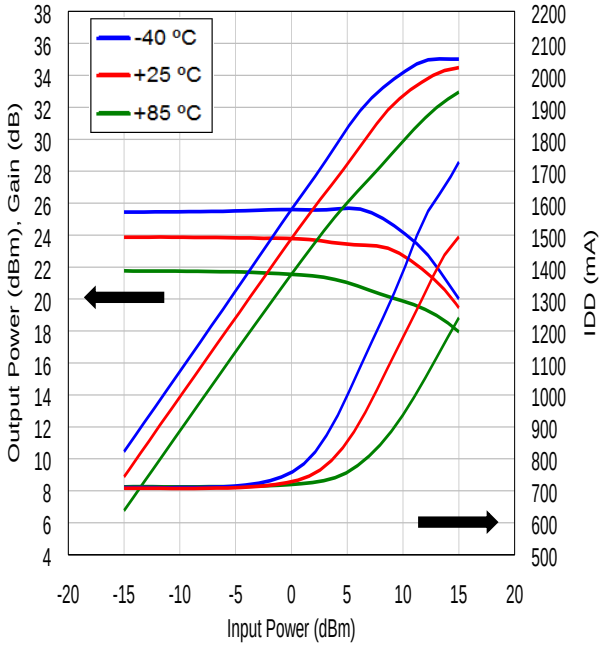
VDD = +7 V, IDD = 700 mA @ 12 GHz



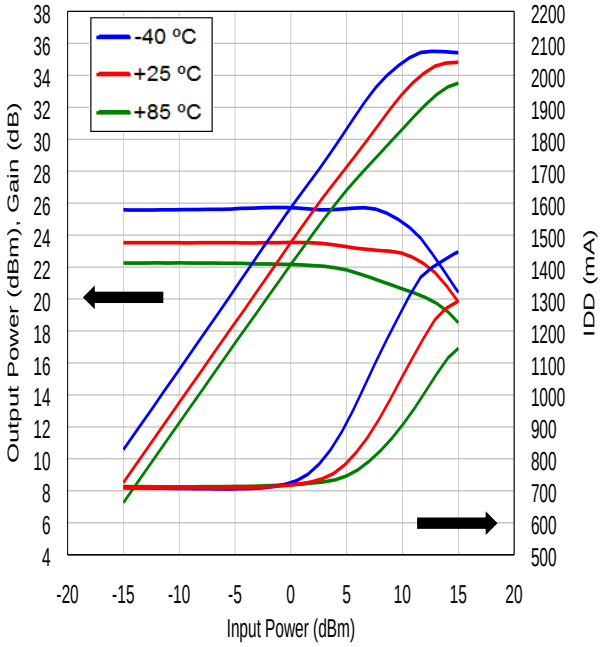
VDD = +7 V, IDD = 700 mA @ 13 GHz



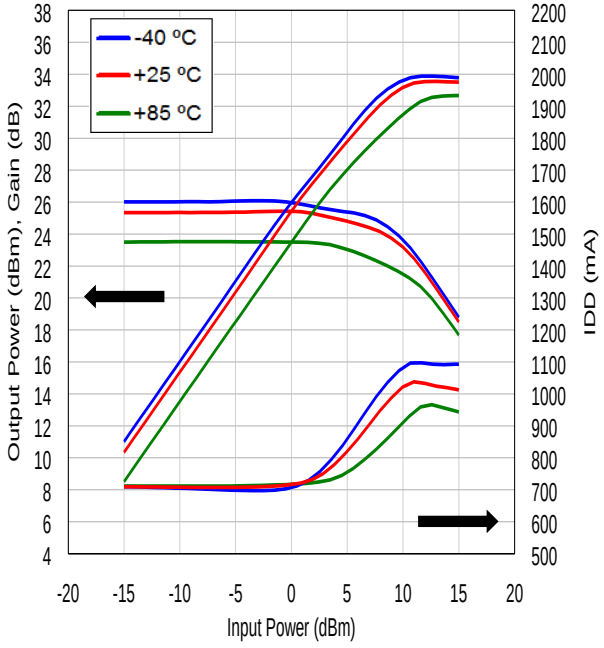
VDD = +7 V, IDD = 700 mA @ 14 GHz



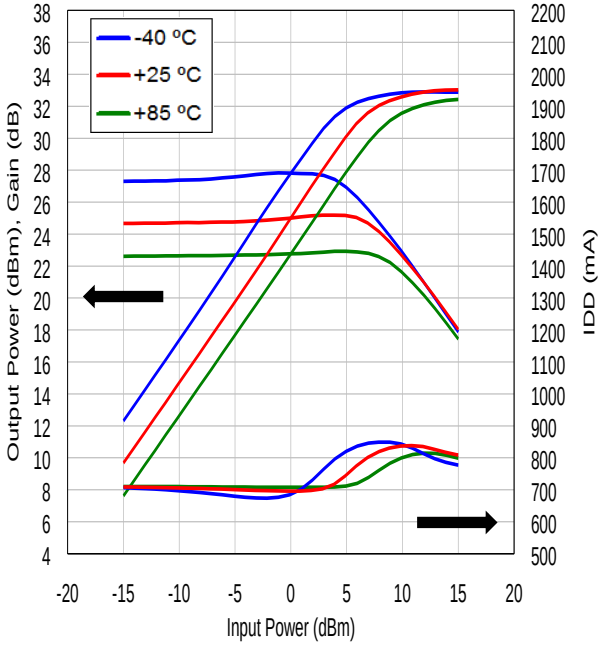
VDD = +7 V, IDD = 700 mA @ 15 GHz



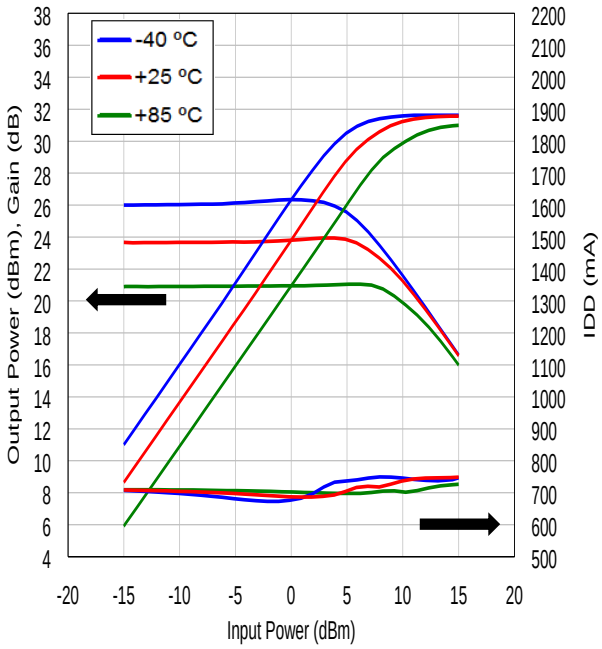
VDD = +7 V, IDD = 700 mA @ 16 GHz



VDD = +7 V, IDD = 700 mA @ 17 GHz



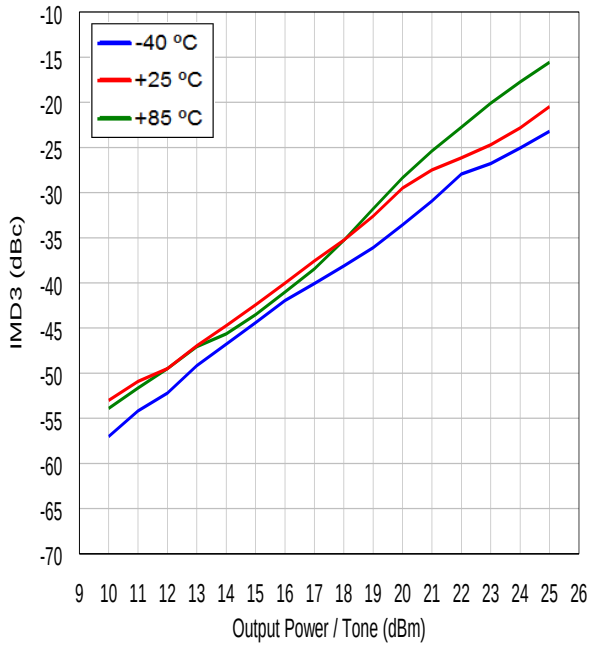
VDD = +7 V, IDD = 700 mA @ 18 GHz



IMD3 vs. Output Power / Tone by Temperature

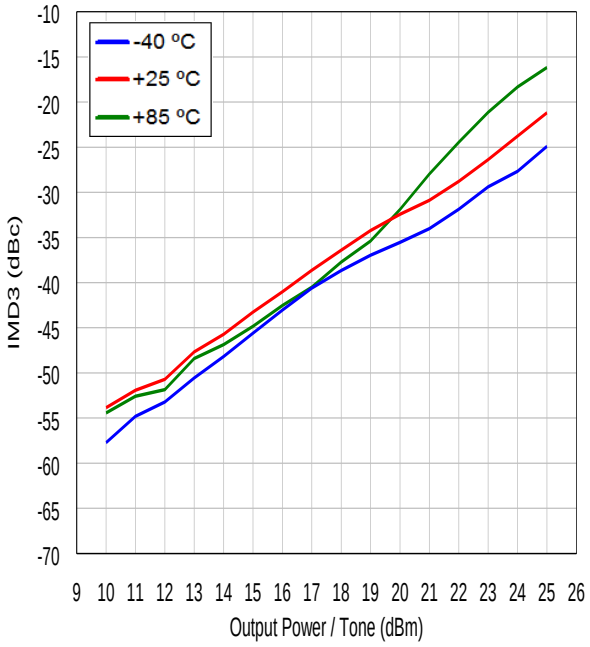
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 6 GHz



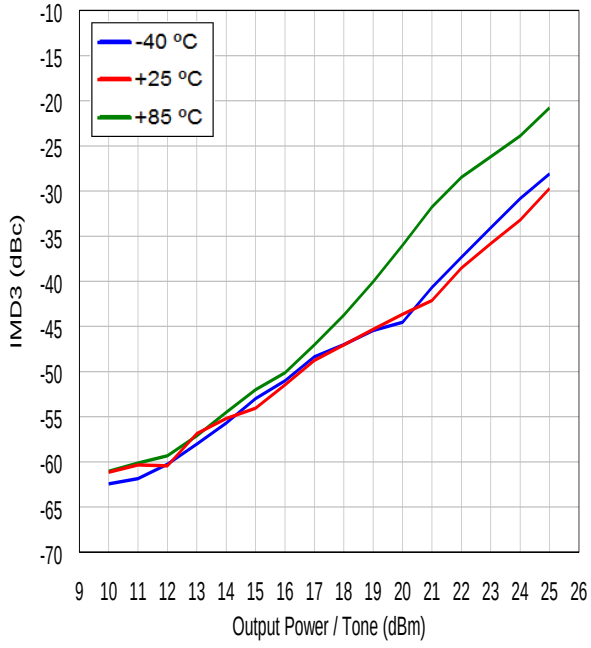
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 7 GHz



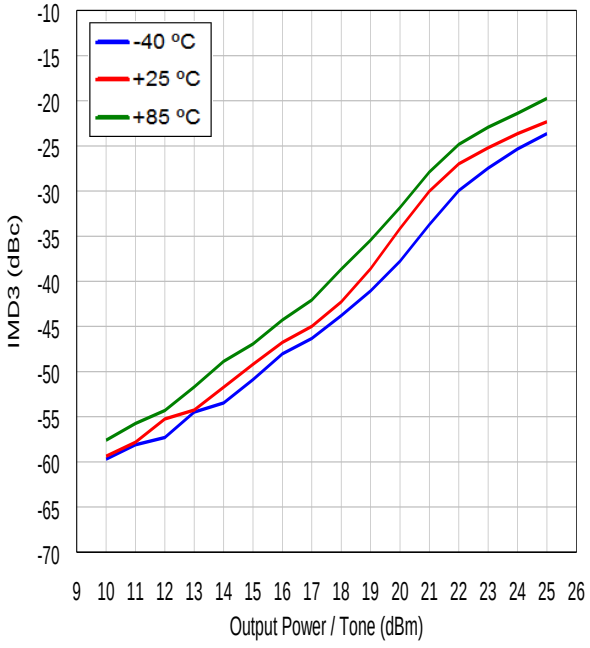
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 8 GHz



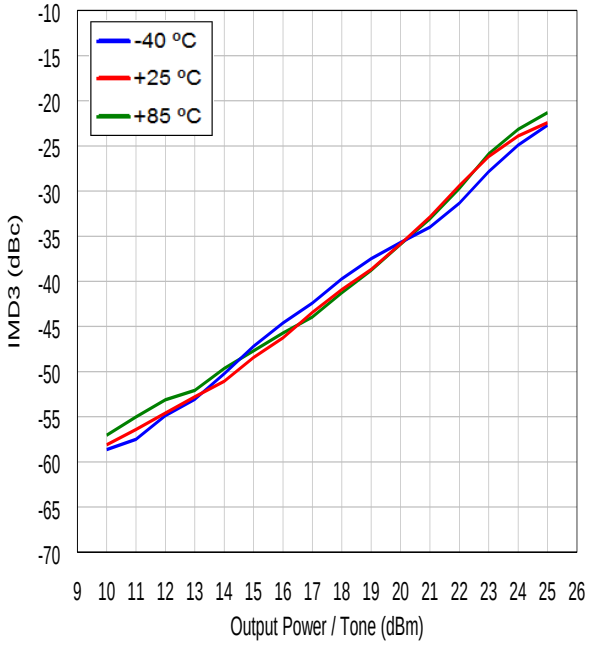
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 9 GHz



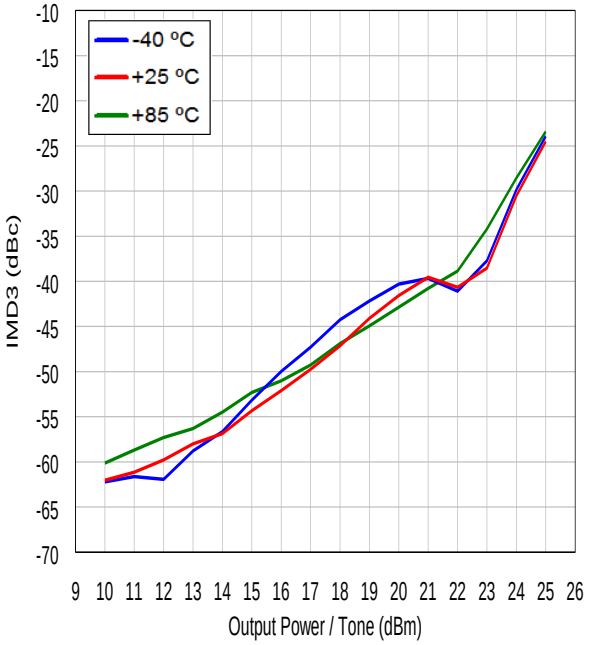
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 10 GHz



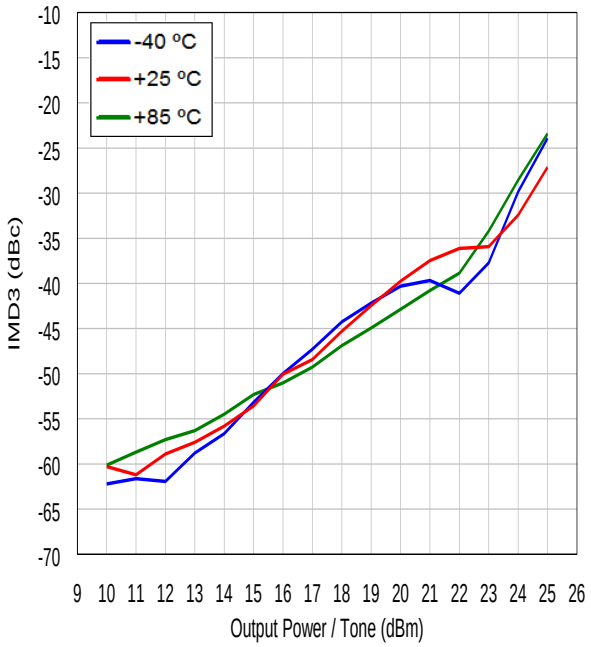
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 11 GHz



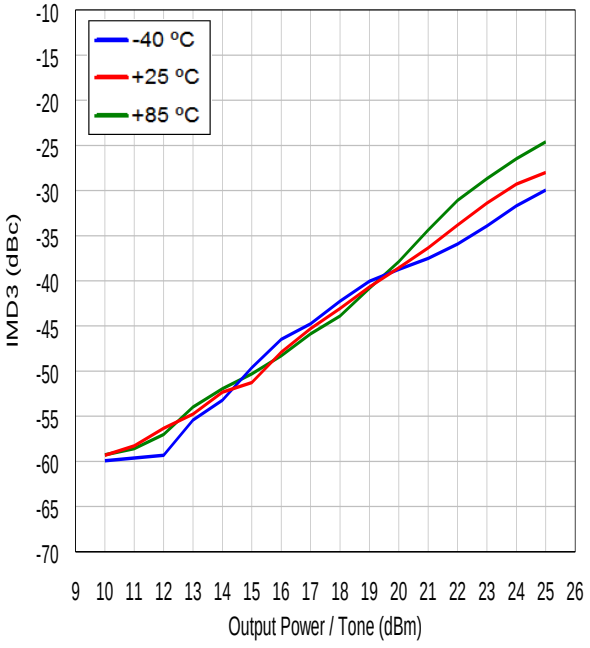
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 12 GHz



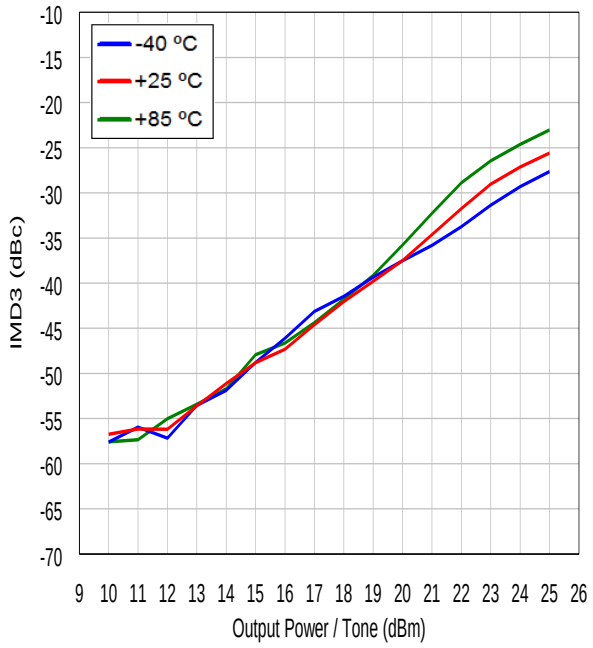
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 13 GHz



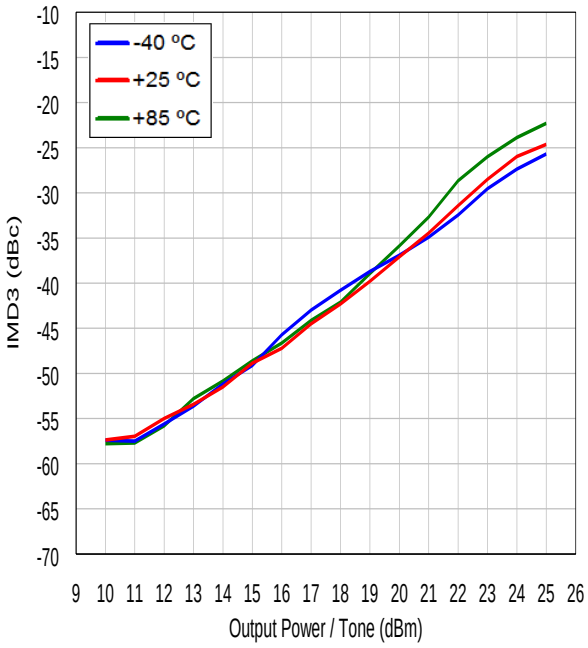
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 14 GHz



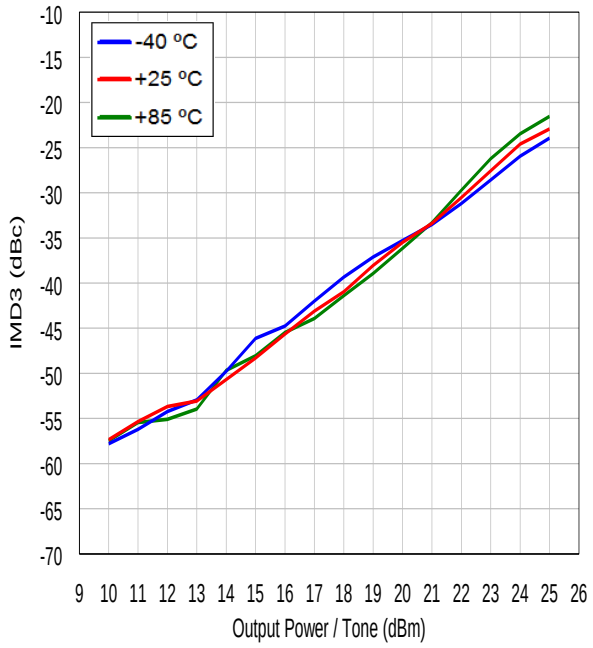
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 15 GHz



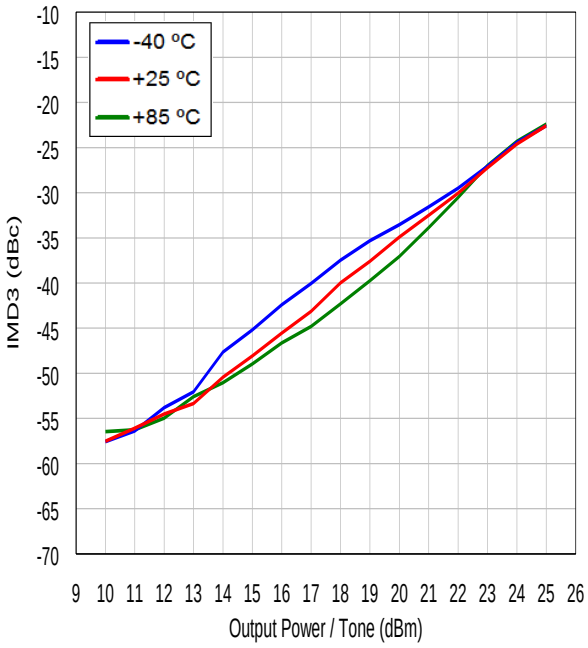
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 16 GHz



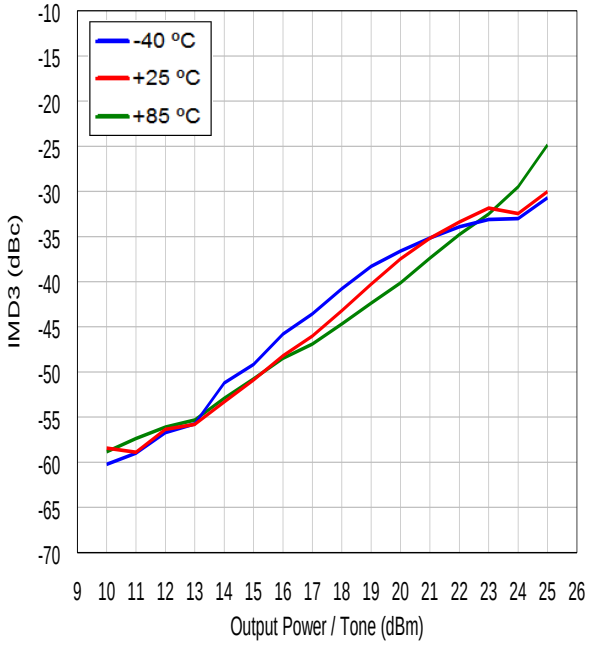
VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 17 GHz



VDD = +7 V, IDD = 700 mA, Δf = 10 MHz

@ 18 GHz



4. Mounting Instructions for Flange Package

4.1 Screw Mounting

4.1.1 The flange of package should be attached using screws. Torque conditions are shown in table 1.

Table 1. Recommended and Maximum Torque for Screw Mounting

Package	Recommended Screw	Recommended Torque	Maximum Torque
Flange	M2.0	10 N-cm (0.9 lb-in)	15 N-cm (1.3 lb-in)

4.1.2 First, tighten the screws with a torque driver set to 5 N-cm

4.1.3 The surface finish of the heat sinker should be better than 0.8 μm and the surface flatness must be better than 10 μm.

4.1.4 Silicon based heat sink compounds should not be used for the thermal conductive grease. It causes the poor grounding of the source flange, contamination, and long term degradation of thermal resistance between the package and heat sinker.

4.2. Solder Mounting

4.2.1 Recommended solder is lead-free solder (Sn-3.0Ag-0.5Cu) or equivalent.

4.2.2 After soldering, the flux residue should be removed by appropriate cleaning methods.

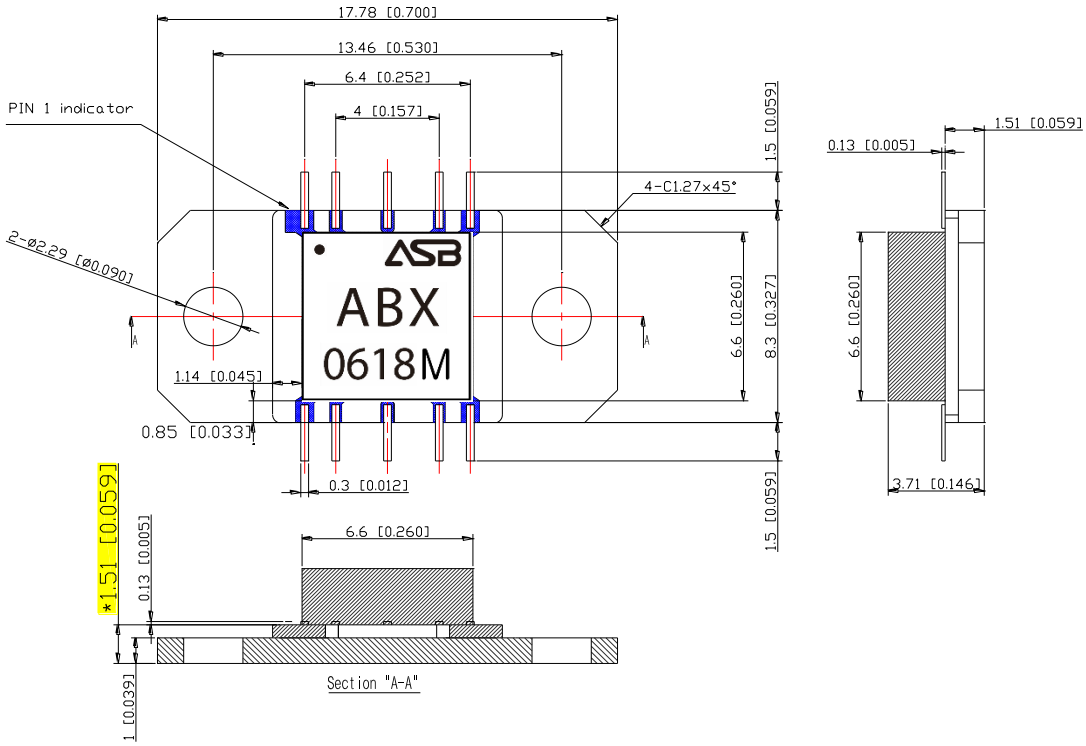
4.2.3 The recommended soldering conditions are as follows:

Partial heating method: Soldering iron, spot laser/air

Product terminal temperature: 260°C, max. 10 sec/terminal or 400°C, max. 3 sec/terminal

5. Package Outline

Units: mm [in]



* Please note the 1.51 mm of the height of the lead from the bottom of the metal base when it is to be mounted.

(End of Datasheet)

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