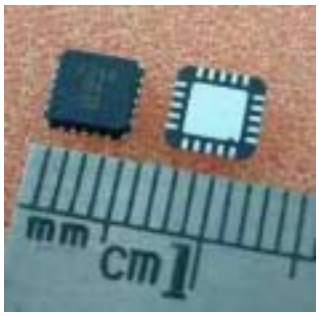
Preliminary

ES/EMM5079ZB

X/ Ku-Band Power Amplifier MMIC

FEATURES

- •Output Power; P1dB = 25.5 dBm (Typ.)
- •High Gain; GL = 23 dB(Typ.)
- •Wide Frequency Band ; 10.0 – 15.4 GHz
- •Impedance Matched Zin/Zout = 50Ω
- •QFN 20pin Plastic Mold Package(ZB)



DESCRIPTION

The ES/EMM5079ZB is a wide band power amplifier MMIC that contains a four stage amplifier, internally matched, for standard communications band in 10.0 to 15.4GHz frequency range. This product is well suited for point-to-point radio and VSAT applications.
Eudyna's stringent Quality Assurance Program assures the highest reliability and consistent performance.

ABSOLUTE MAXIMUM RATING

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DD}	10	V
Gate-Source Voltage	V_{GG}	-3	V
Input Power	P_{in}	TBD	dBm
Storage Temperature	T_{stg}	-55 to +125	°C

RECOMMENDED OPERATING CONDITIONS

Item	Symbol	Condition	Unit
Drain-Source Voltage	V_{DD}	<=6	V
Input Power	P_{in}	TBD	dBm
Operating Backside Temperature	Top	-40 to +85	℃

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25°C)

Item	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Frequency Range	f	V_{DD}=6V	10	-	15.4	GHz
Output Power at 1dB G.C.P.	P_{1dB}	I_{DD}(DC)=350mA typ. Zs=Zl=50ohm	TBD	25.5*1 24*2	-	dBm
Power Gain at 1dB G.C.P.	G_{1dB}		TBD	22*1 24*2	-	dB
Power-added Efficiency at 1dB G.C.P.	ηadd	*1 : f=10.0~12.7GHz *2 : f=12.7~15.4GHz	- -	17*1 15*2	- -	%
Third Order Intermodulation*3	IM3*3	*3 : Δf=10MHz , 2-Tone Test,	TBD	-35*1 -40*2	- -	dBc
Drain Current at 1dB G.C.P.	IDD	Pout=15dBm S.C.L.	-	380	TBD	mA
Input Return Loss (at Pin=-20dBm)	RL_{in}		-	-10	-	dB
Output Return Loss (at Pin=-20dBm)	RL_{out}		-	-10	-	dB

G.C.P.:Gain Compression Point, S.C.L.:Single Carrier Level

ESD	**~ 199V**

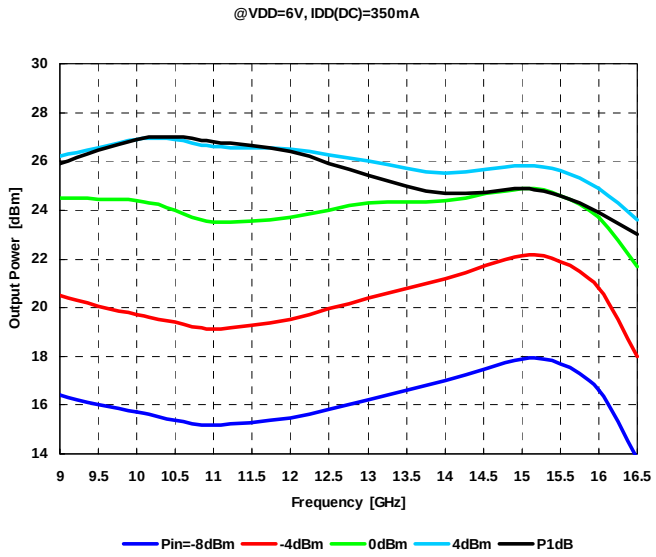
Note : Based on EIAJ ED-4701 C-111A(C=100pF, R=1.5kΩ)

CASE STYLE	**ZB**

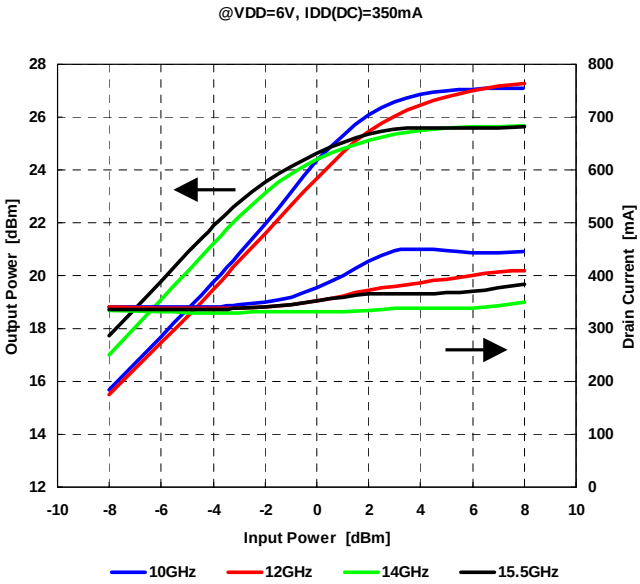
MSL	**3**

Note : Based on IPC/JEDEC J-STD-020C

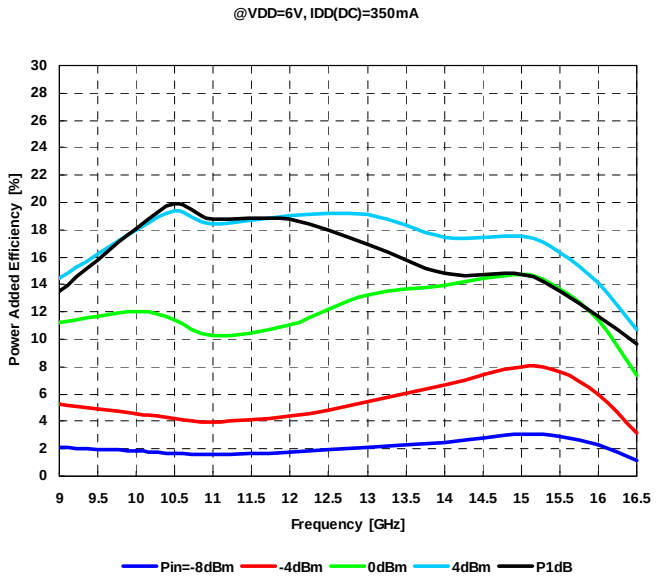
Output Power vs. Frequency



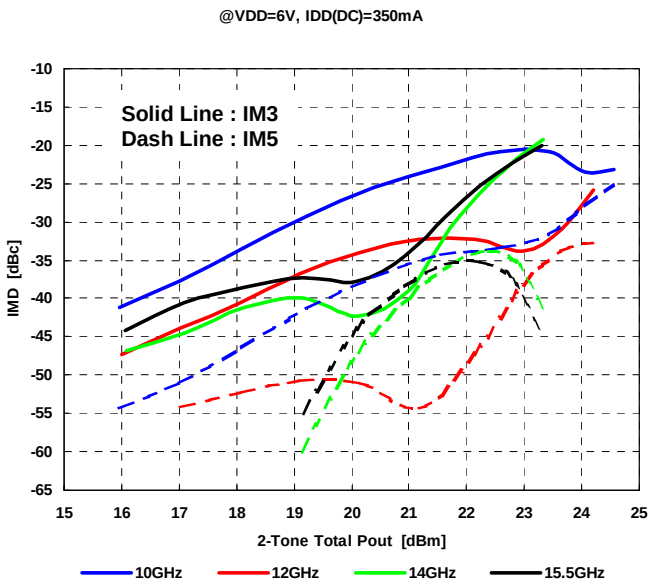
Output Power, Drain Current vs. Input Power



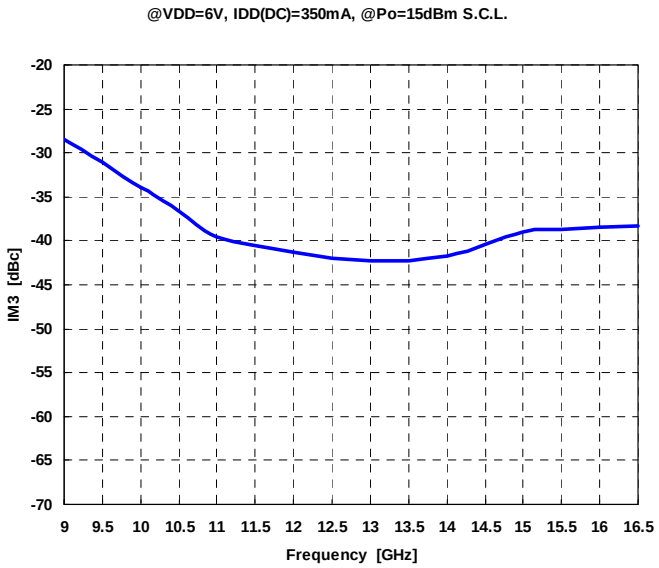
Power Added Efficiency vs. Frequency



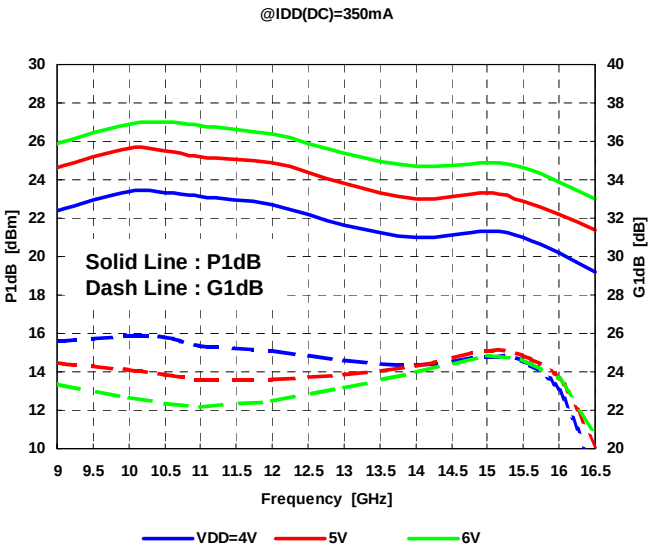
IMD vs. Output Power



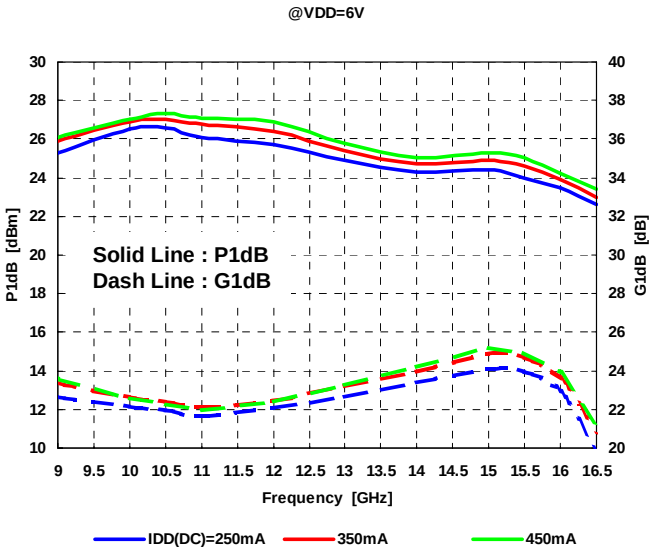
IM3 vs. Frequency



P1dB, G1dB vs. Frequency by Drain Voltage

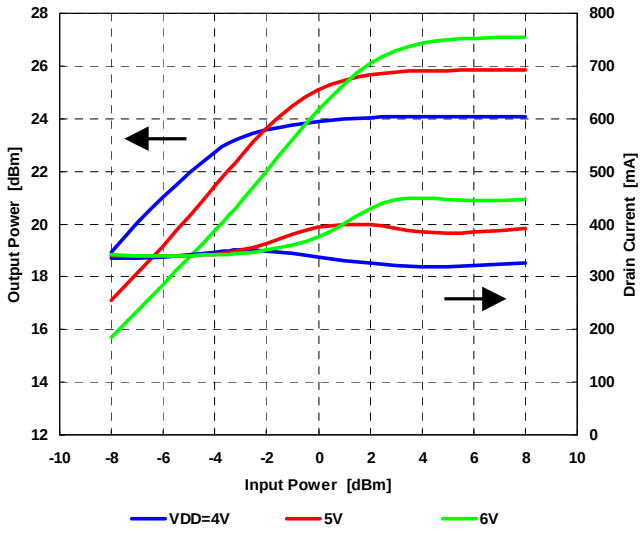


P1dB, G1dB vs. Frequency by Drain Current



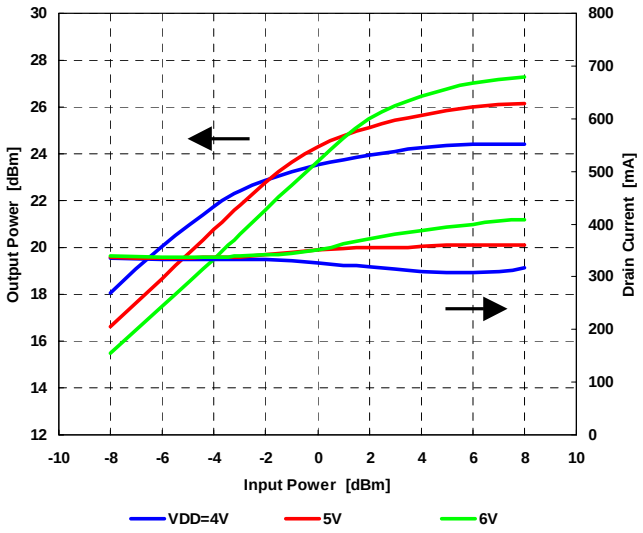
Output Power, Drain Current vs. Input Power by Drain Voltage

@f=10GHz, IDD(DC)=350mA



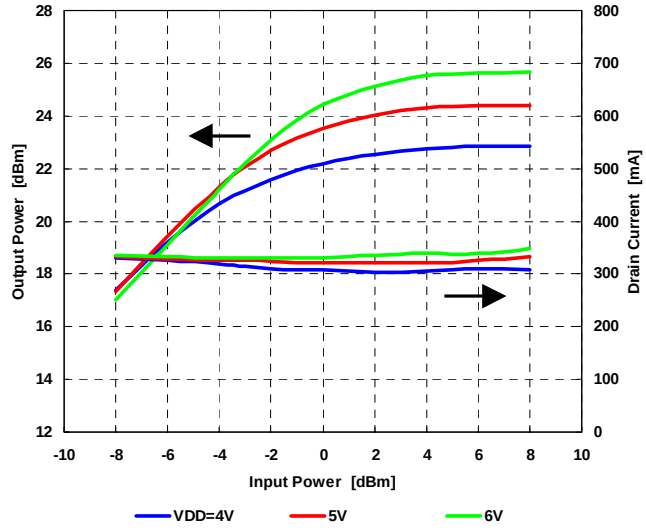
Output Power, Drain Current vs. Input Power by Drain Voltage

@f=12GHz, IDD(DC)=350mA



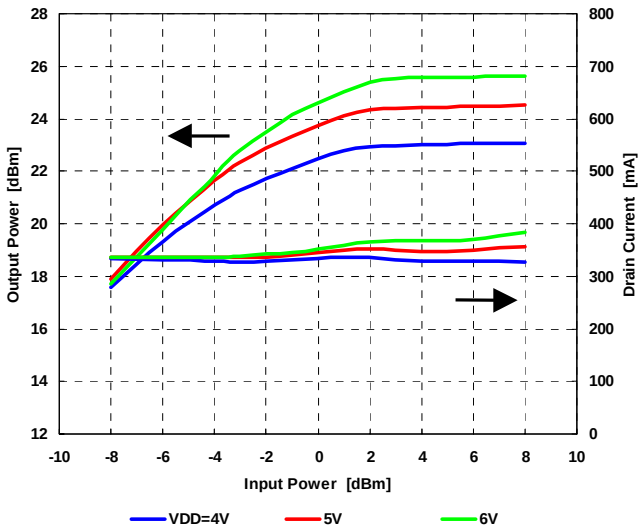
Output Power, Drain Current vs. Input Power by Drain Voltage

@f=14GHz, IDD(DC)=350mA



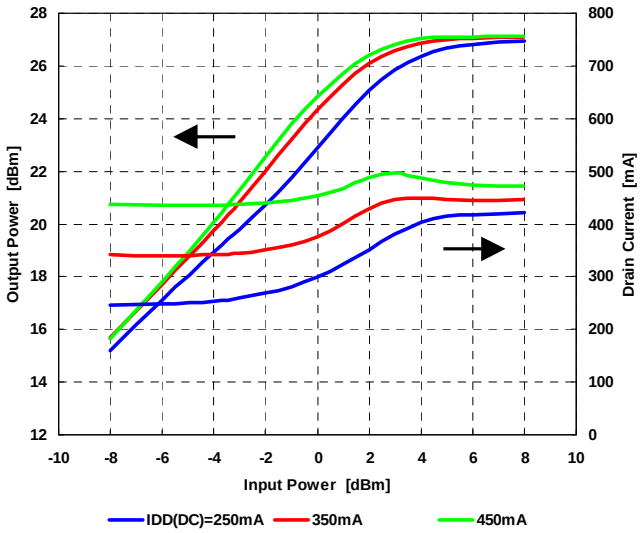
Output Power, Drain Current vs. Input Power by Drain Voltage

@f=15.4GHz, IDD(DC)=350mA



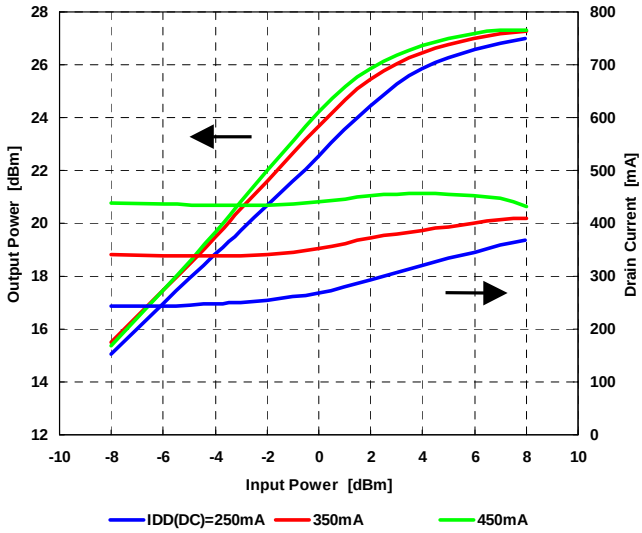
Output Power, Drain Current vs. Input Power by Drain Current

@f=10GHz, VDD=6V



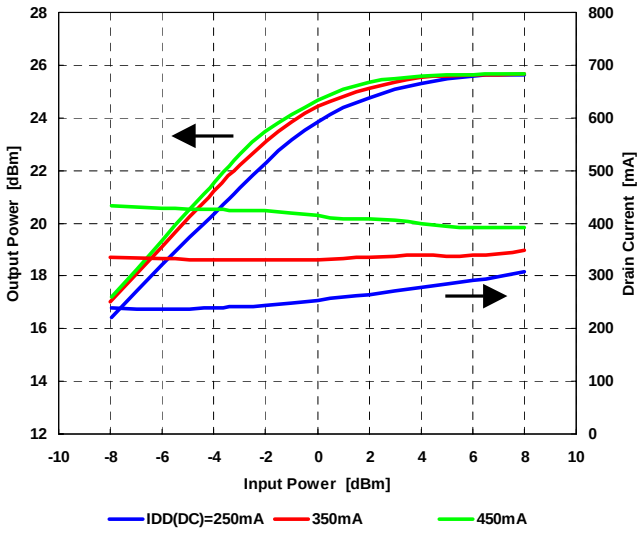
Output Power, Drain Current vs. Input Power by Drain Current

@f=12GHz, VDD=6V



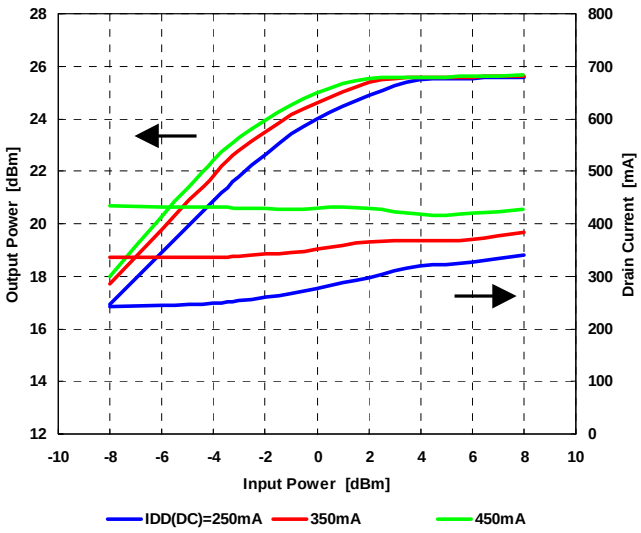
Output Power, Drain Current vs. Input Power by Drain Current

@f=14GHz, VDD=6V



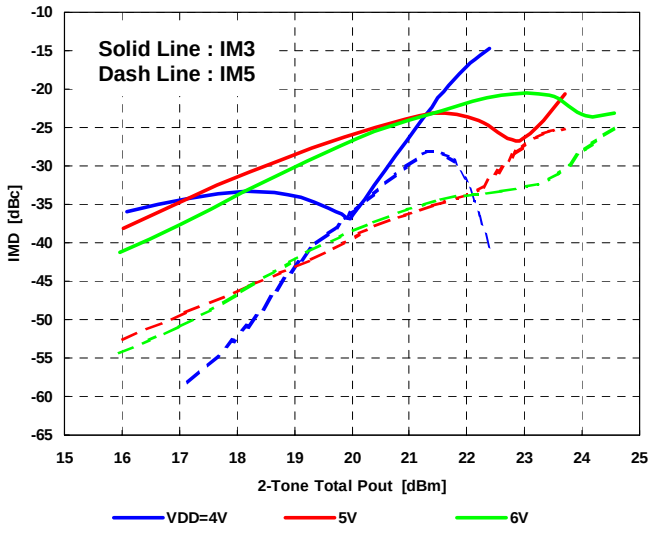
Output Power, Drain Current vs. Input Power by Drain Current

@f=15.4GHz, VDD=6V



IMD vs. Output Power by Drain Voltage

@f=10GHz, IDD(DC)=350mA



IMD vs. Output Power by Drain Voltage

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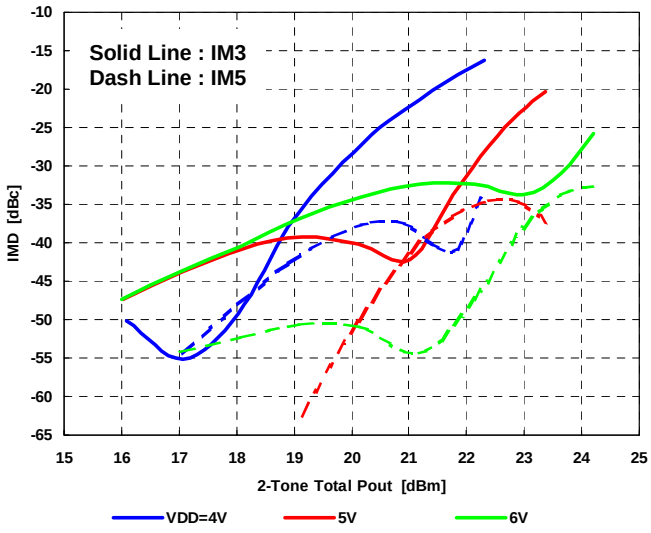

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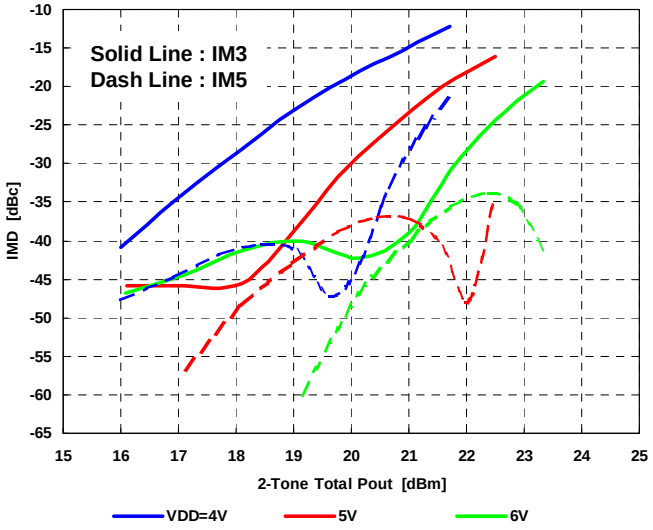

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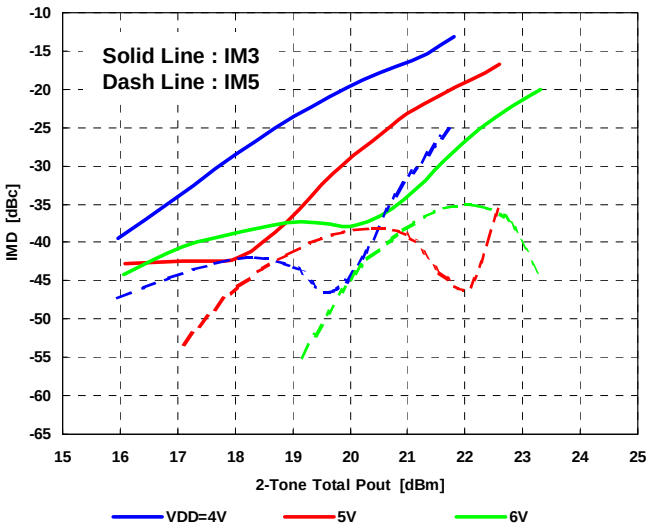
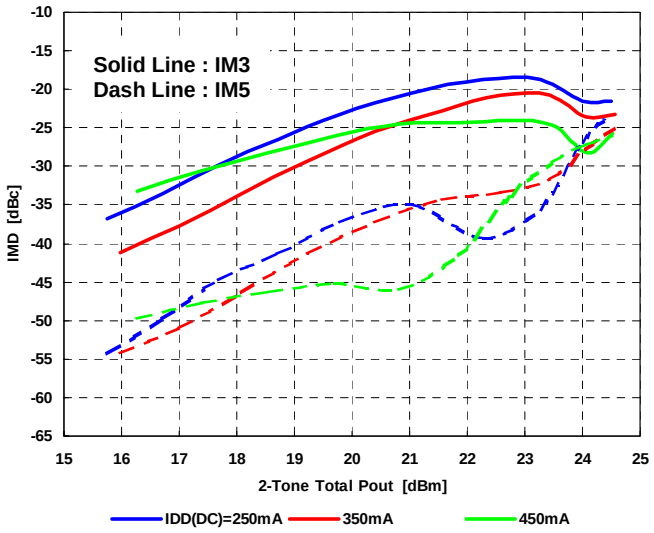


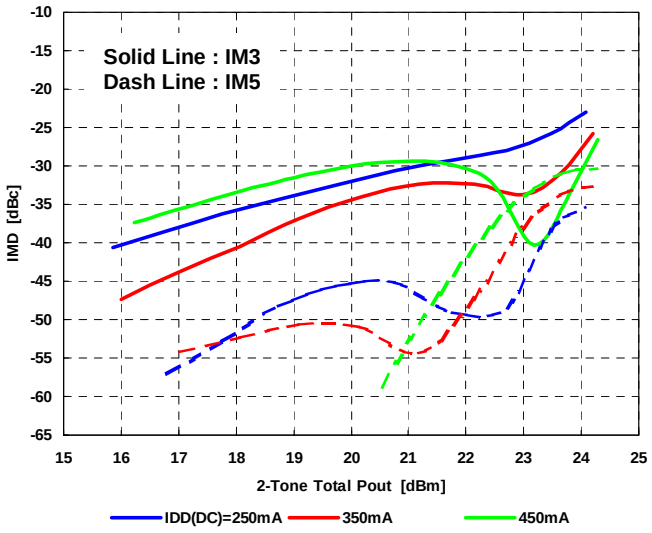
IMD vs. Output Power by Drain Current

@f=10GHz, VDD=6V



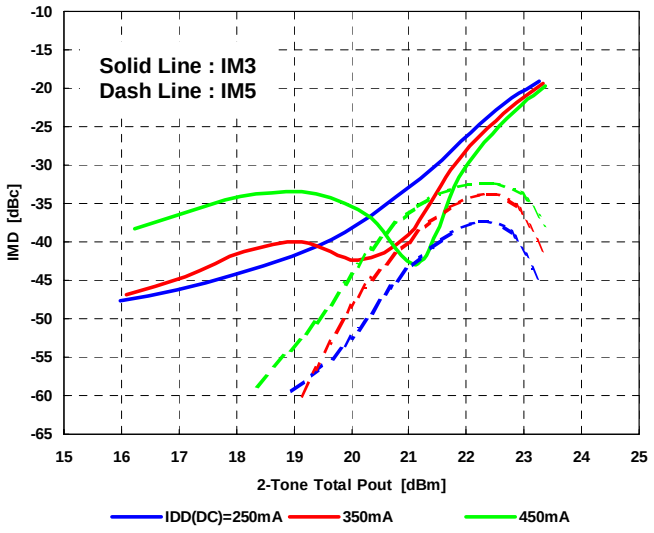
IMD vs. Output Power by Drain Current

@f=12GHz, VDD=6V



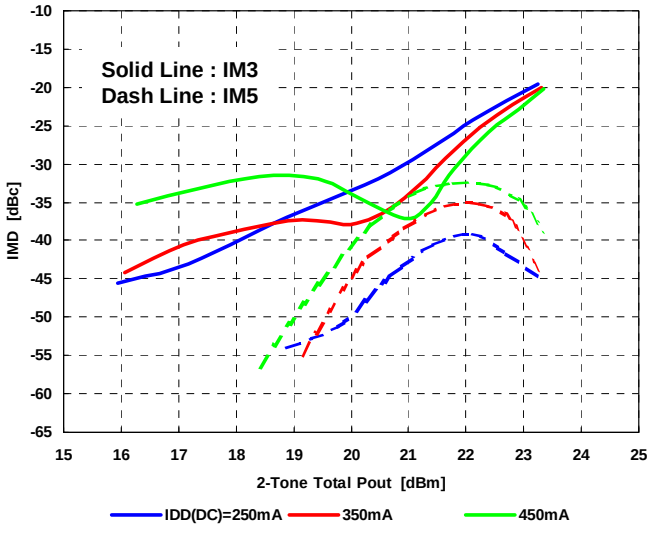
IMD vs. Output Power by Drain Current

@f=14GHz, VDD=6V



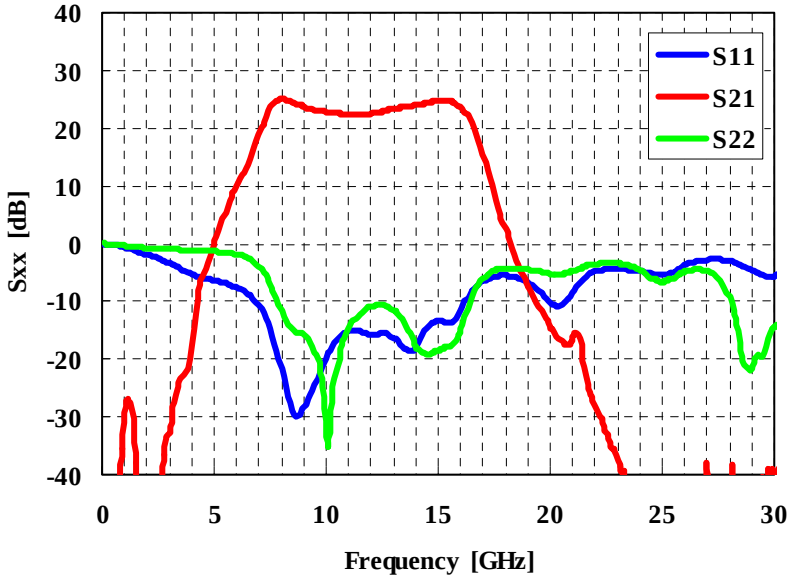
IMD vs. Output Power by Drain Current

@f=15.4GHz, VDD=6V

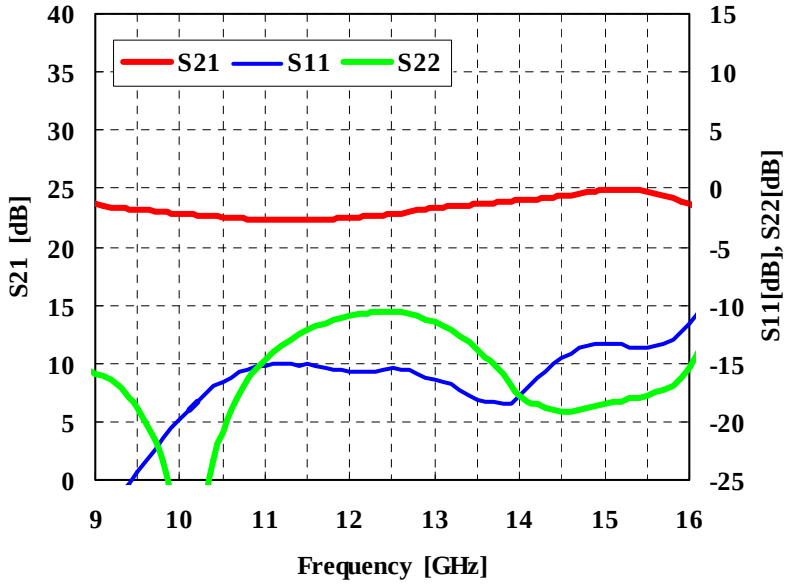


■ **S-Parameter**

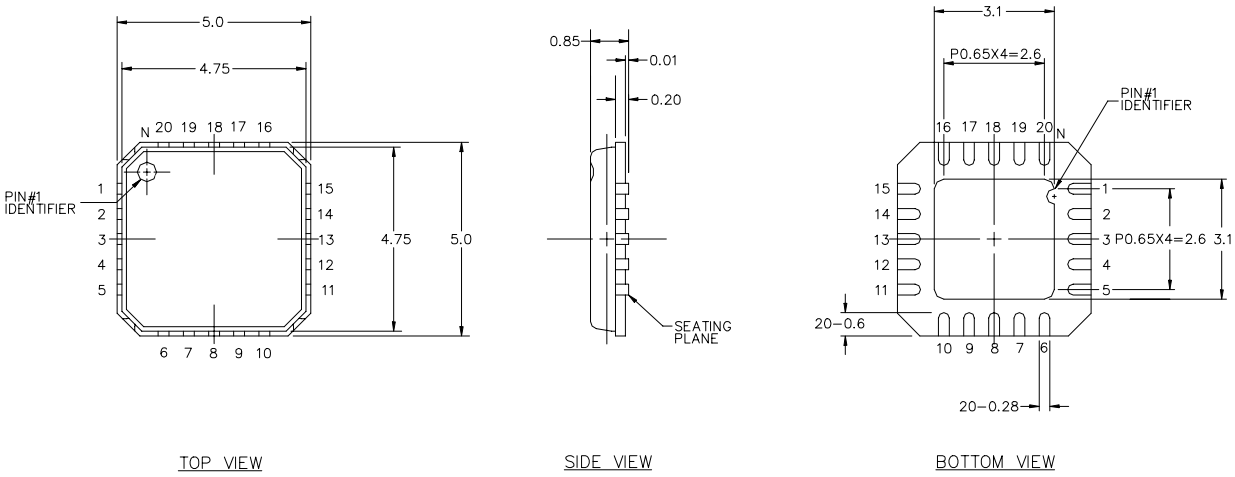
VDD/IDD(DC)=6V/350mA



VDD/IDD(DC)=6V/350mA



■Package Outline and Pin Assignment

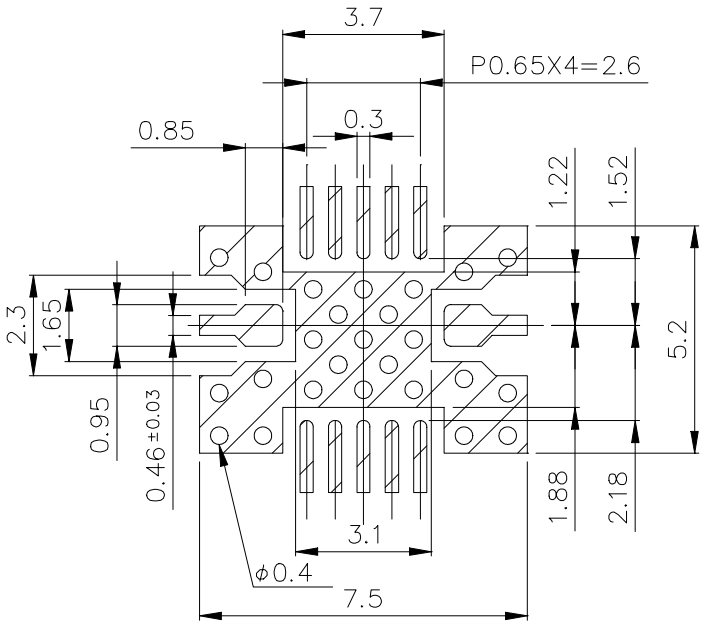


Unit : mm

PIN Assignment

RF IN : 2,3
RF OUT : 13,14
VGG : 20
VDD1 : 7
VDD2 : 8
VDD3 : 9
VDD4 : 10
N/C : 1,4,5,6,11,12,15,16,17,18,19

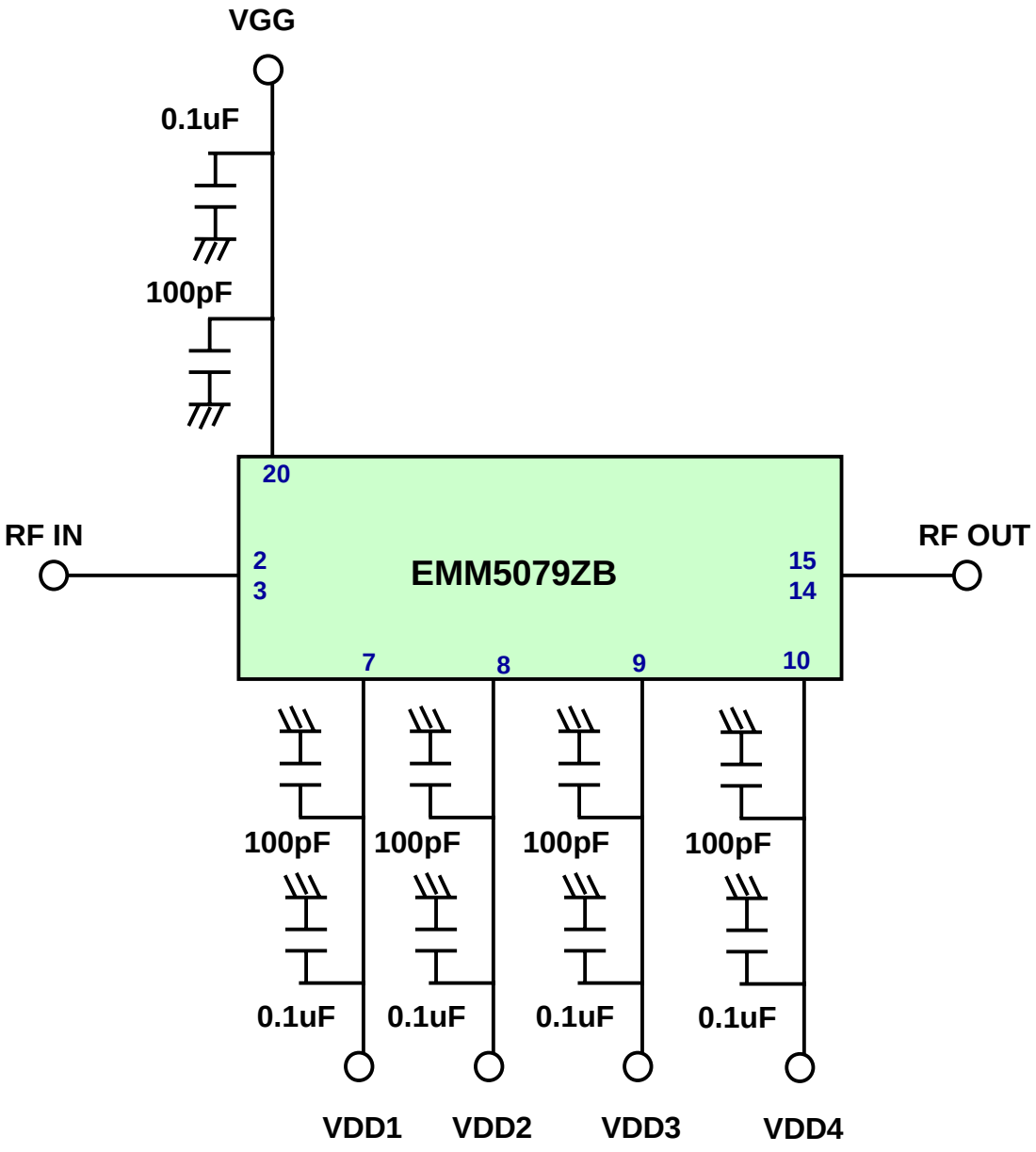
■ **PCB Pads and Solder-resist Pattern**



Unit : mm

Notes :
1.LAMINATE : Rogers Corporation RO4003, Thickness t=0.2mm, Cu Foil 18μm
Finish to copper foil ; Ni 0.1μm min./Au 0.1±0.08μm (Both side)

■Recommended Bias Network



■ Mounting Instructions for ZB Package for Lead-free solder

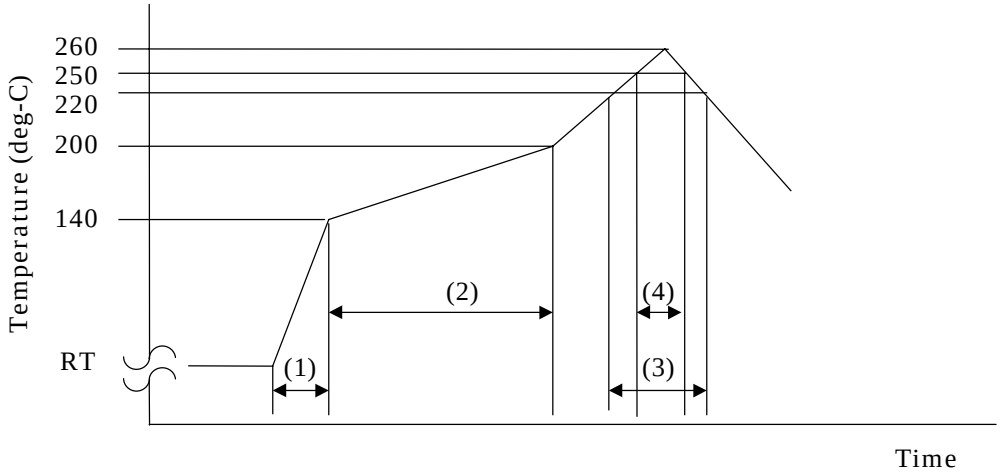
Mounting Condition

1. For soldering, Lead-free solder (Sn-3.0Ag-0.5Cu)*1 or equivalent shall be used.
   (*1:The figure displays with weight %. A predominantly tin-rich alloy with 3.0% silver and 0.5% copper.)
2. A rosin type flux with a chlorine content of 0.2% or less shall be used. The rosin flux with low halogen content is recommended.
3. When soldering, use one of the following time/ temperature methods for acceptable solder joints. Make sure the devices have been properly prepared with flux prior soldering.

*** Reflow soldering method (Infrared reflow / Heat circulation reflow / Hot plate reflow):**

Limit solder to 3 reflow cycles because resin is used in the modules manufacturing process. Excessive reflow will effect the resin resulting in a potential failure or latent defect. The recommended reflow temperature profile is shown below. The temperature of the reflow profile must be measured at the device lead.

Reflow temperature profile and condition:



(1) Temperature rise: 5deg-C/sec.
(2) Preheating: 140 - 220deg-C 60 - 120sec.
(3) Main heating: 220deg-C over. 10 - 40sec.
(4) Main heating: 250deg-C over. 10 sec. (260deg-C max.)
* Measurement point: Device lead.

4. The above-recommended conditions were confirmed using the manufacture's equipment and materials. However, when soldering these products, the soldering condition should be verified by customer using their equipment and materials.

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CAUTION

Eudyna Devices Inc. products contain **gallium arsenide (GaAs)** which can be hazardous to the human body and the environment. For safety, observe the following procedures:

・Do not put these products into the mouth.

・Do not alter the form of this product into a gas, powder, or liquid through burning, crushing, or chemical processing as these by-products are dangerous to the human body if inhaled, ingested, or swallowed.

・Observe government laws and company regulations when discarding this product. This product must be discarded in accordance with methods specified by applicable hazardous waste procedures.