

ELM5964-16F

C-Band Internally Matched FET

FEATURES

- High Output Power: P1dB=42.5dBm (Typ)
- High Gain: G1dB=10.0dB (Typ.)
- High PAE: $\eta_{add}=40\%$ (Typ.)
- Frequency Band: 5.9~6.4GHz
- Impedance Matched Zin/Zout = 50 Ω
- Hermetically Sealed Package

DESCRIPTION

The ELM5964-16F is a power GaAs FET that is internally matched for standard communication bands to provide optimum power and gain in a 50 Ω system.



ABSOLUTE MAXIMUM RATING (Case Temperature Tc=25 deg-C)

Item	Symbol	Rating	Unit
Drain-Source Voltage	V _{DS}	15	V
Gate-Source Voltage	V _{GS}	-5	V
Total Power Dissipation	P _T	46.9	W
Storage Temperature	T _{STG}	-65 to +175	deg-C
Channel Temperature	T _{CH}	175	deg-C

RECOMMENDED OPERATING CONDITION (Case Temperature Tc=25 deg-C)

Item	Symbol	Condition	Limit	Unit
DC Input Voltage	V _{DS}		<10	V
Forward Gate Current	I _{GF}	R _G =51 ohm	<+43.0	mA
Reverse Gate Current	I _{GR}	R _G =51 ohm	>-11.0	mA
Storage Temperature	T _{STG}		-55 to +125	deg-C
Channel Temperature	T _{CH}		155	deg-C

ELECTRICAL CHARACTERISTICS (Case Temperature Tc=25 deg-C)

Item	Symbol	Condition	Limit			Unit
			Min.	Typ.	Max.	
Drain Current	I _{DSS}	V _{DS} =5V, V _{GS} =0V	-	7.6	11.4	A
Trans conductance	gm	V _{DS} =5V, I _{DS} =4200mA	-	5	-	S
Pinch-off Voltage	V _P	V _{DS} =5V, I _{DS} =300mA	-0.5	-1.5	-3.0	V
Gage-Source Breakdown Voltage	V _{GSO}	I _{GS} =85uA	-5.0	-	-	V
Output Power at 1dB G.C.P.	P _{1dB}	V _{DS} =10V I _{DS(DC)} =2.8A(Typ.) f=5.9~6.4 GHz	41.5	42.5	-	dBm
Power Gain at 1dB G.C.P.	G _{1dB}		9.0	10.0	-	dB
Drain Current	I _{dsr}		-	4.0	5.0	A
Power Added Efficiency	η_{add}		-	40	-	%
Gain Flatness	ΔG		-	-	1.2	dB
3 rd Order Inter Modulation Distortion	IM ₃	f=6.4GHz Δf =10MHz, 2-tone Test Pout=31.5dBm (S.C.L.)	-40	-45	-	dBc
R _{th}	R _{th}	Channel to Case	-	2.7	3.2	Deg-C/W
ΔT_{ch}	ΔT_{ch}	(V _{DS} × I _{dsr} - P _{out} + P _{in}) × R _{th}	-	-	100	Deg-C

CASE STYLE: IK

ESD	Class 3 A	4000-8000V
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Note: Based on JEDEC JESD22-A114D (C=100pF, R=1500 Ω)



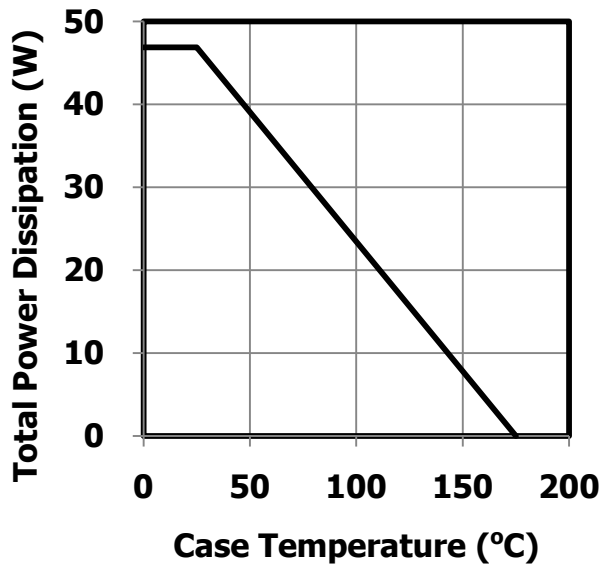
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- RF Characteristics

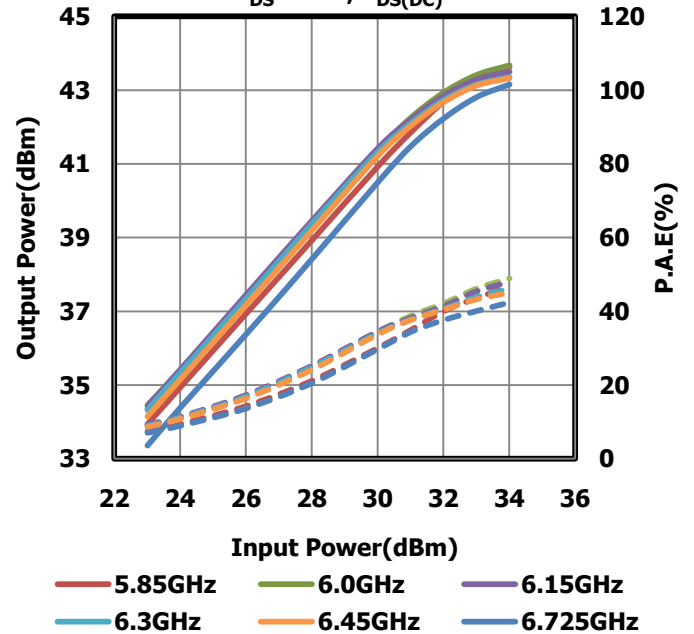


Power Derating Curve



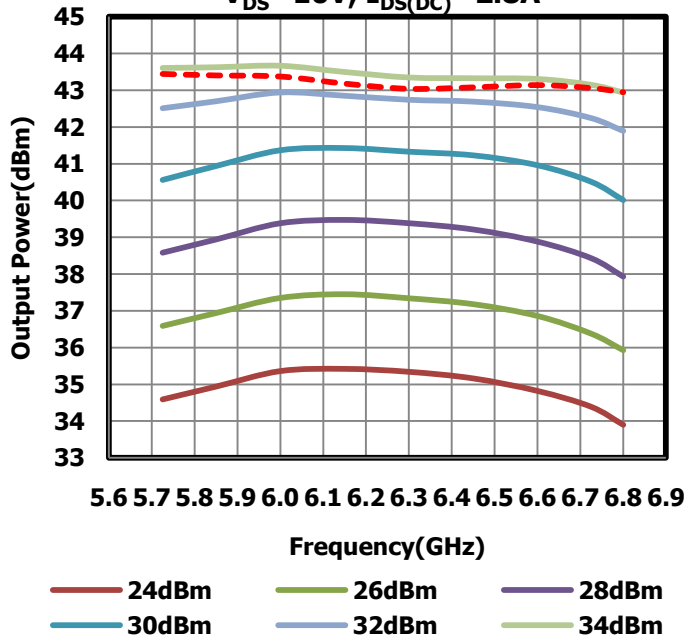
Output Power & P.A.E. vs. Input Power

$V_{DS}=10V, I_{DS(DC)}=2.8A$



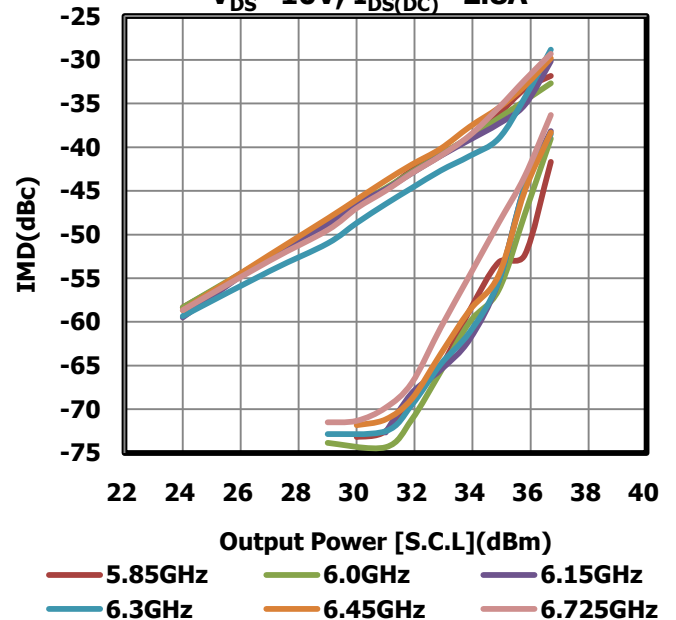
Output Power vs. Frequency

$V_{DS}=10V, I_{DS(DC)}=2.8A$



Output Power vs. IMD

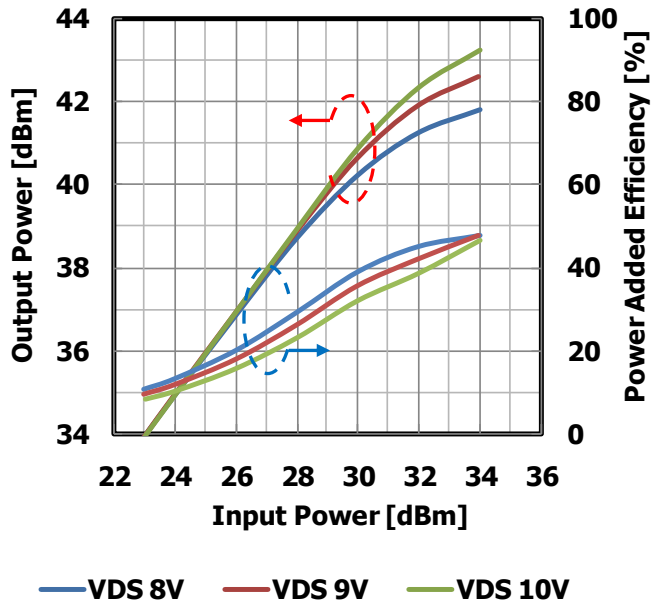
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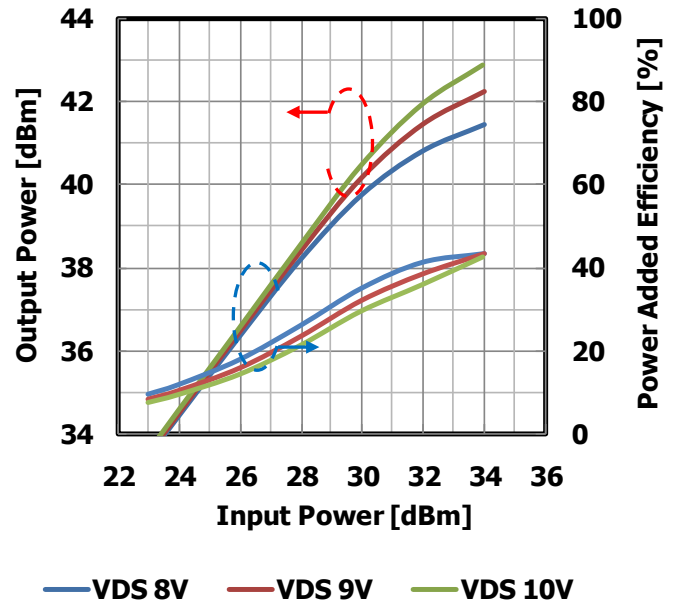
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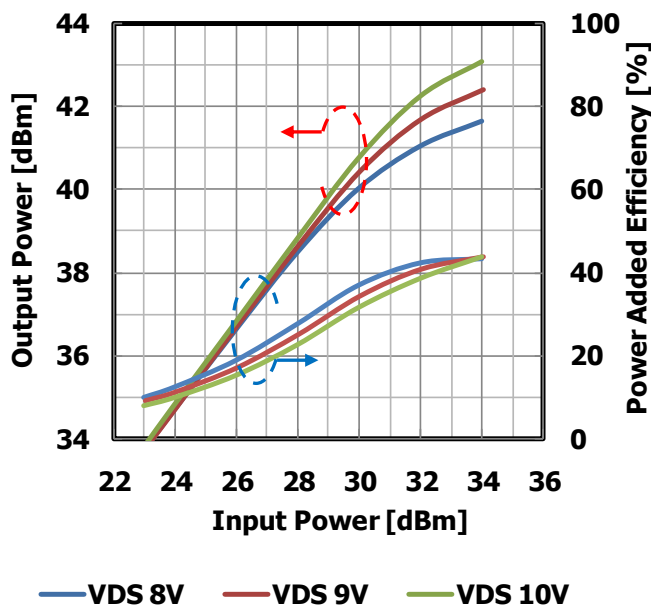
Input Power vs. Output Power,
Power Added Efficiency by Drain Voltage
 $I_{DS(DC)}=2800\text{mA}$ @5.9GHz



Input Power vs. Output Power,
Power Added Efficiency by Drain Voltage
 $I_{DS(DC)}=2800\text{mA}$ @6.15GHz



Input Power vs. Output Power,
Power Added Efficiency by Drain Voltage
 $I_{DS(DC)}=2800\text{mA}$ @6.4GHz

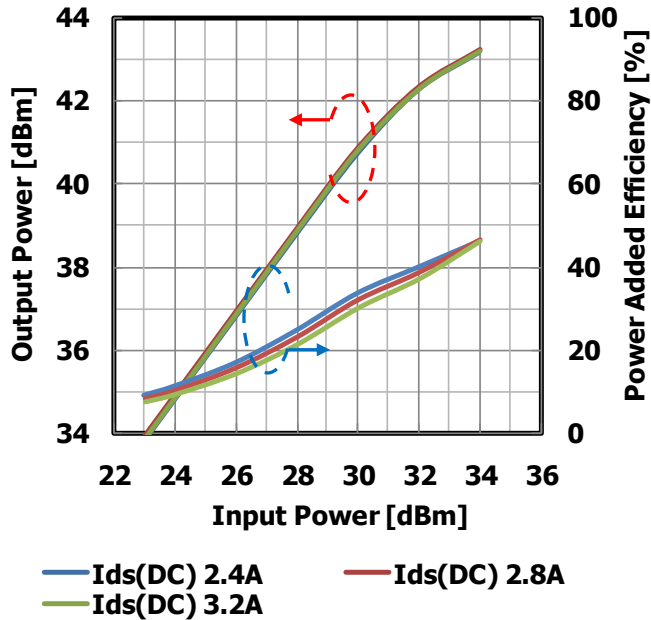


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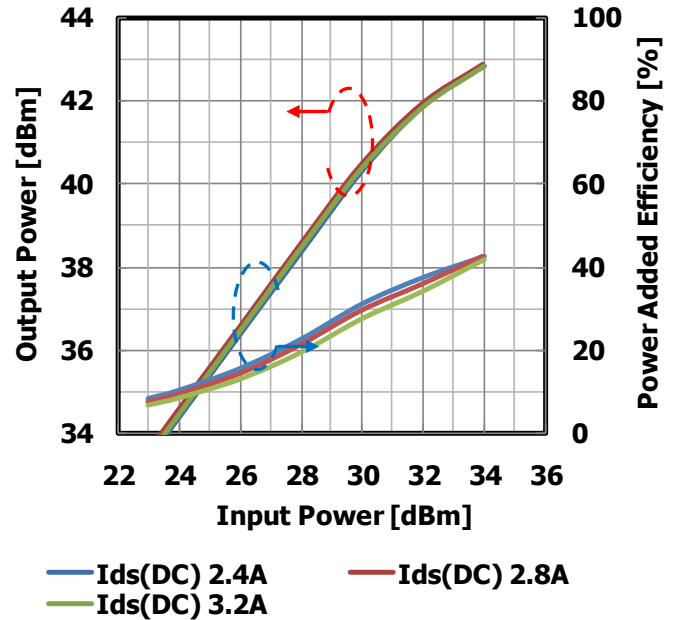
C-Band Internally Matched FET



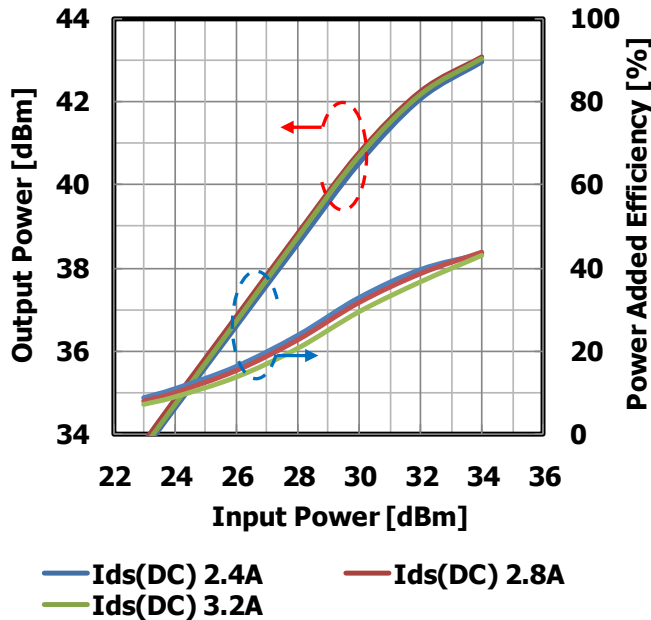
Input Power vs. Output Power, Power Added Efficiency by Quiescent Drain Current
 $V_{DS}=10V$ @5.9GHz



Input Power vs. Output Power, Power Added Efficiency by Quiescent Drain Current
 $V_{DS}=10V$ @6.15GHz



Input Power vs. Output Power, Power Added Efficiency by Quiescent Drain Current
 $V_{DS}=10V$ @6.4GHz

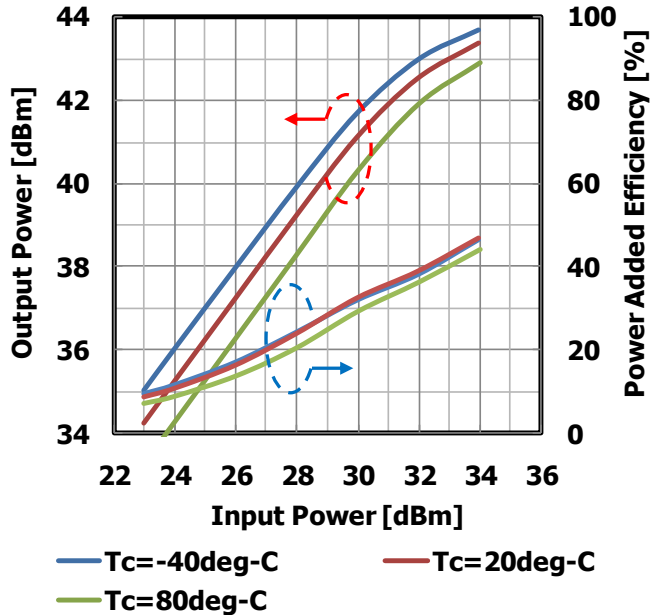


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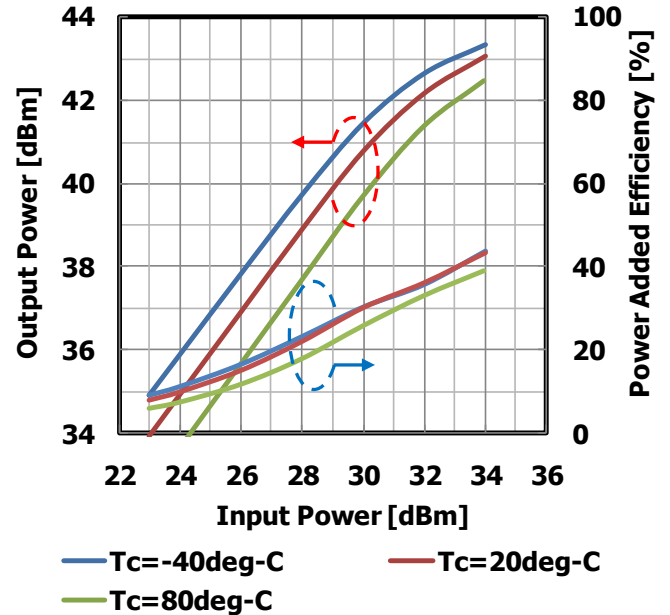
Input Power vs. Output Power, Power Added Efficiency by Temperature

$V_{DS}=10V$, $I_{DS(DC)}=2800mA$ @5.9GHz



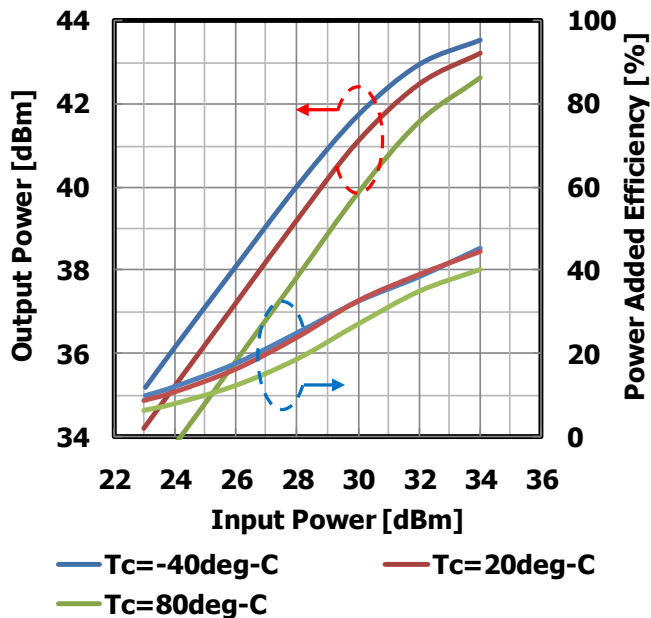
Input Power vs. Output Power, Power Added Efficiency by Temperature

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Input Power vs. Output Power, Power Added Efficiency by Temperature

$V_{DS}=10V$, $I_{DS(DC)}=2800mA$ @6.4GHz

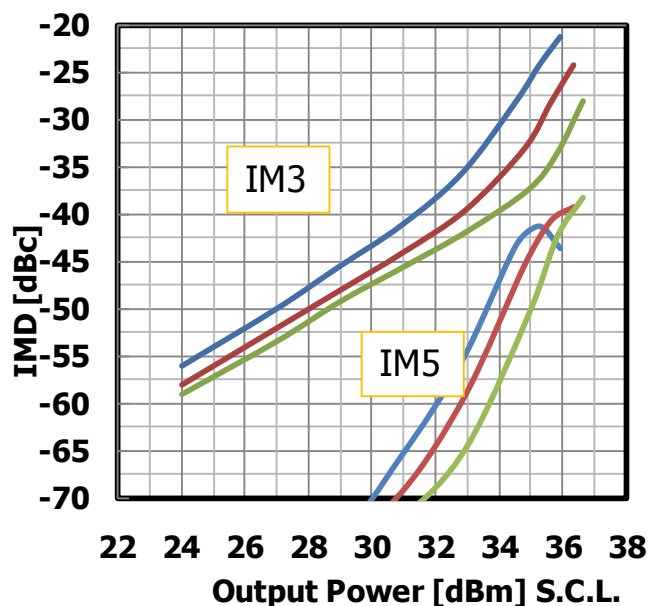


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IMD Performance vs. Output Power
by Drain Voltage

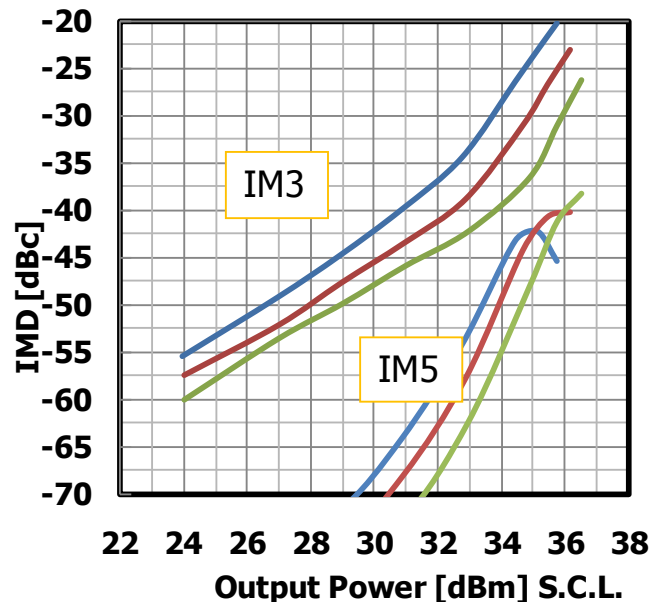
$I_{DS(DC)} = 2800\text{mA}$ @ 5.9GHz



— VDS 8V — VDS 9V — VDS 10V

IMD Performance vs. Output Power
by Drain Voltage

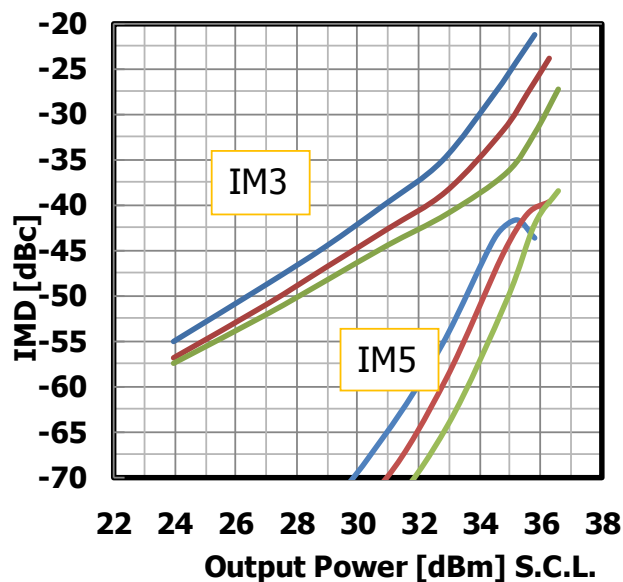
$I_{DS(DC)} = 2800\text{mA}$ @ 6.15GHz



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IMD Performance vs. Output Power
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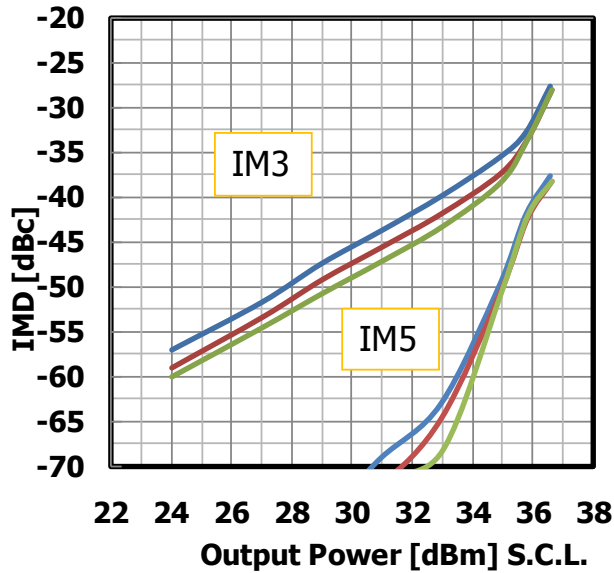
$I_{DS(DC)} = 2800\text{mA}$ @ 6.4GHz



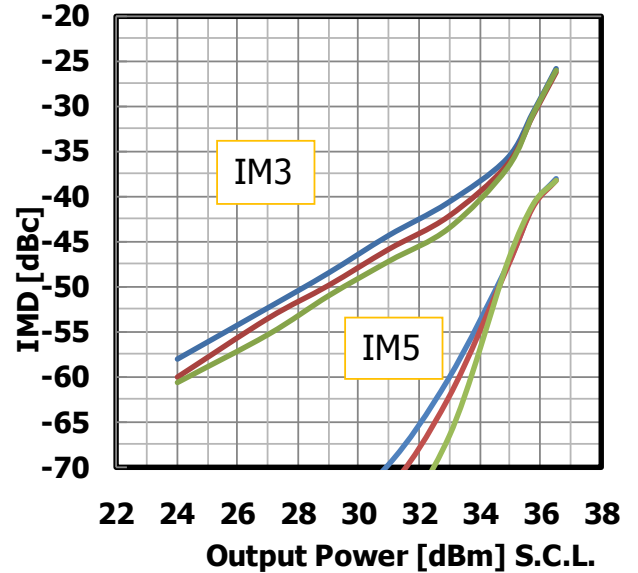
— VDS 8V — VDS 9V — VDS 10V



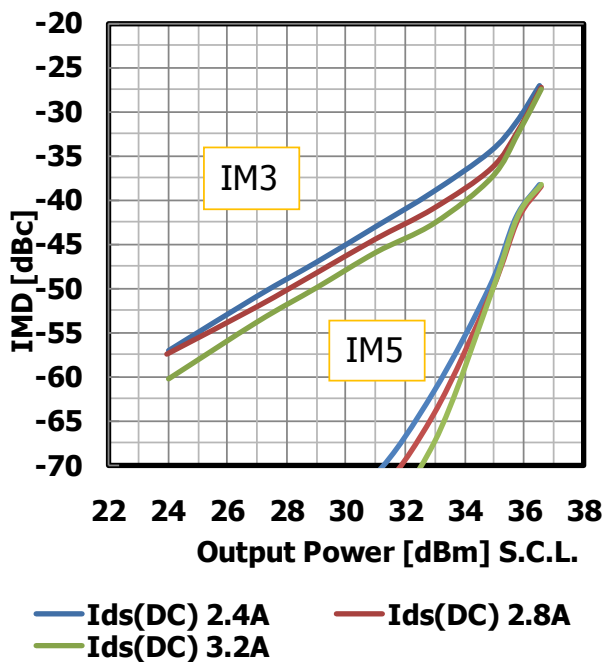
IMD Performance vs. Output Power by Quiescent Drain Current
 $V_{DS}=10V$ @5.9GHz



IMD Performance vs. Output Power by Quiescent Drain Current
 $V_{DS}=10V$ @6.15GHz



IMD Performance vs. Output Power by Quiescent Drain Current
 $V_{DS}=10V$ @6.4GHz

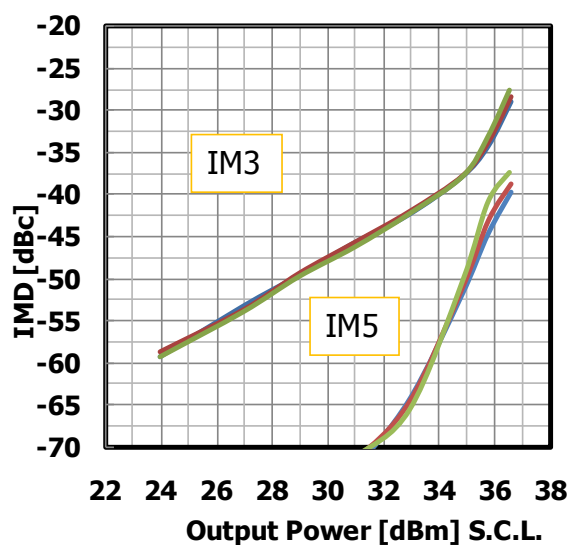


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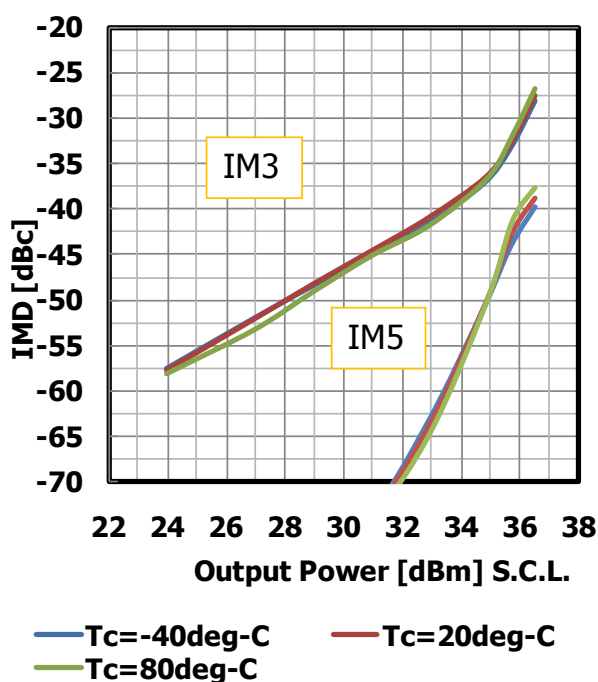
IMD Performance vs. Output Power by Temperature

$V_{DS}=10V$, $I_{DS(DC)}=2800mA$ @5.9GHz



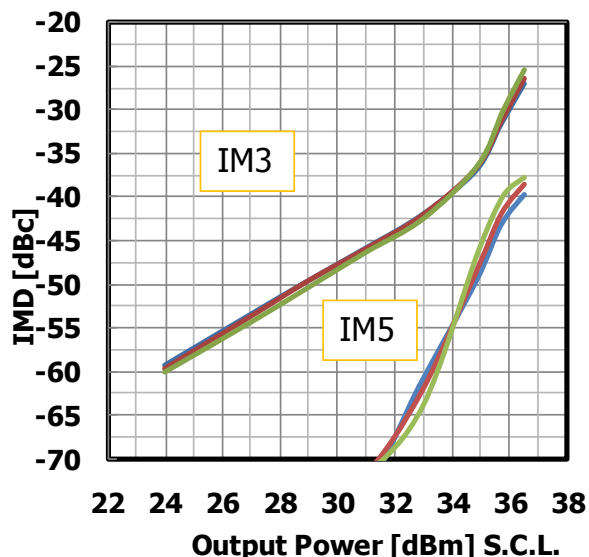
IMD Performance vs. Output Power by Temperature

$V_{DS}=10V$, $I_{DS(DC)}=2800mA$ @6.4GHz



IMD Performance vs. Output Power by Temperature

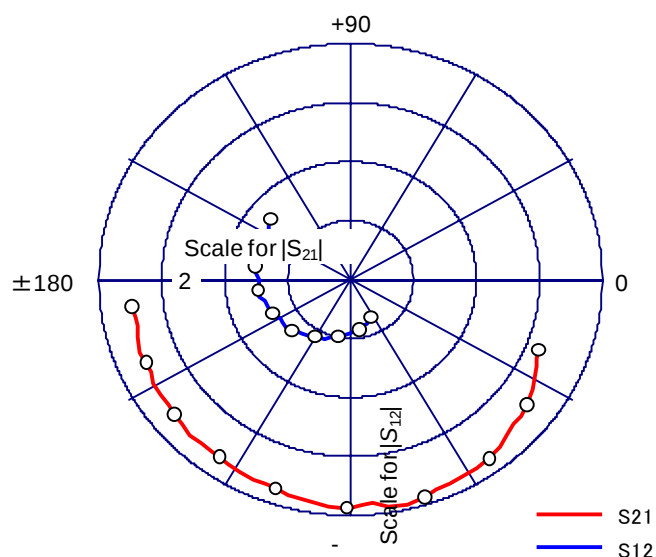
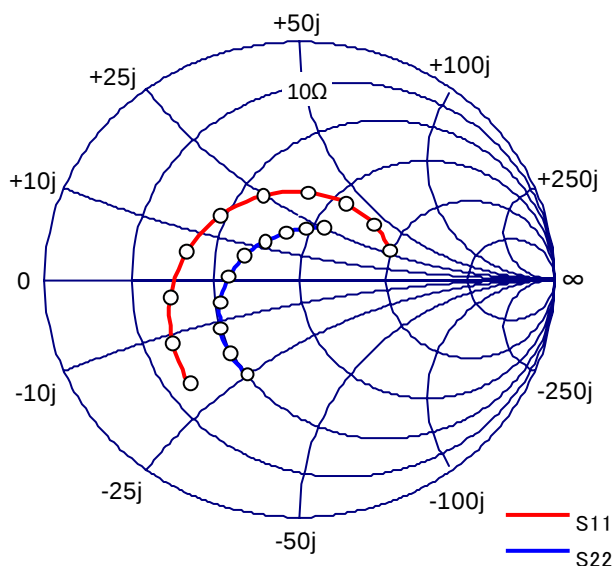
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● S-Parameter



Frequency	S11		S21		S12		S22	
(MHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
5700	0.613	-134.2	3.216	-21.8	0.036	-63.3	0.448	-117.0
5800	0.564	-151.8	3.506	-37.1	0.043	-81.4	0.415	-131.0
5900	0.511	-171.8	3.751	-54.0	0.049	-101.2	0.372	-146.2
6000	0.457	165.2	3.882	-72.2	0.056	-120.5	0.324	-162.9
6100	0.410	139.3	3.870	-90.9	0.063	-137.3	0.277	177.6
6200	0.378	111.8	3.735	-108.6	0.068	-155.2	0.235	155.1
6300	0.367	84.5	3.660	-124.7	0.074	-173.1	0.209	129.8
6400	0.367	59.7	3.604	-140.7	0.077	171.8	0.203	104.7
6500	0.371	38.2	3.539	-156.6	0.079	155.7	0.216	83.0
6600	0.374	19.2	3.504	-172.6	0.082	141.1	0.237	66.0

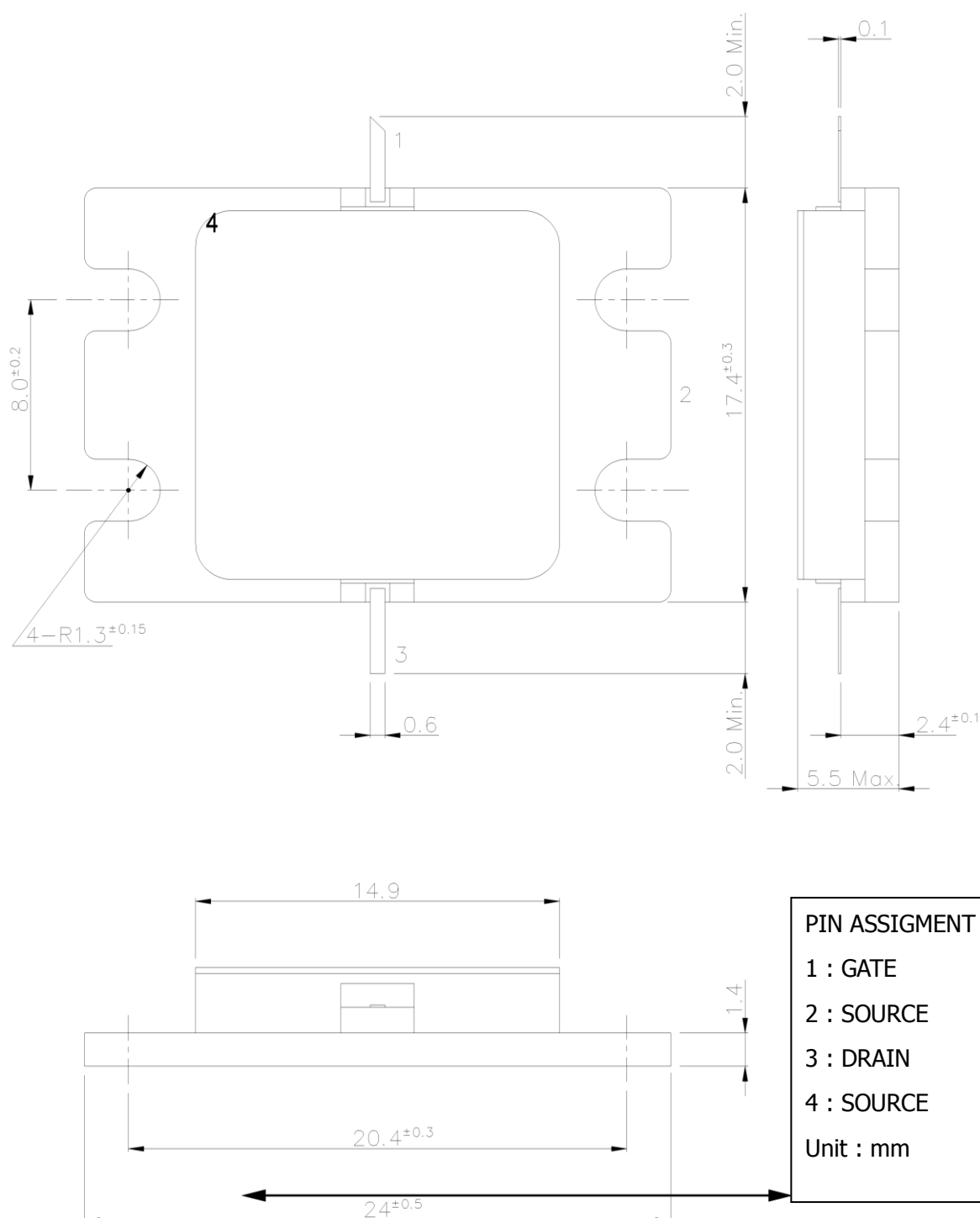


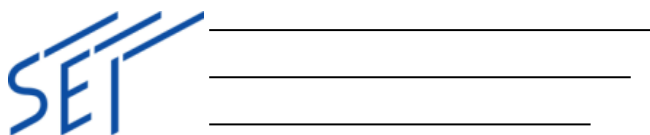
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- Package Out Line

Case Style: IK





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