ELM5964-16F

C-Band Internally Matched FET

FEATURES

- High Output Power: P1dB=42.5dBm (Typ)
- High Gain: G1dB=10.0dB (Typ.)
- High PAE: ηadd=40 %(Typ.)
- Frequency Band: 5.9~6.4GHz
- Impedance Matched Zin/Zout = 50Ω
- 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 50Ω 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
3rd 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}	$(V_{DS} \times I_{dsr} - P_{out} + P_{in}) \times R_{th}$	-	-	100	Deg-C

CASE STYLE: IK

ESD	Class 3 A	4000-8000V

Note: Based on JEDEC JESD22-A114D (C=100pF, R=1500Ω)

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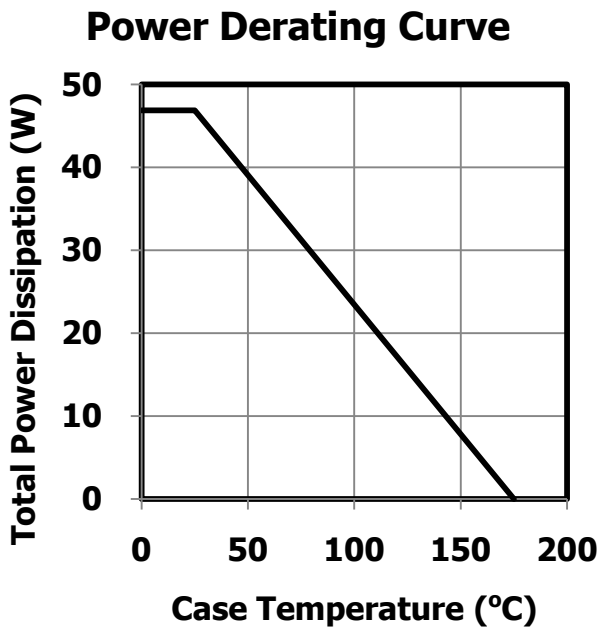
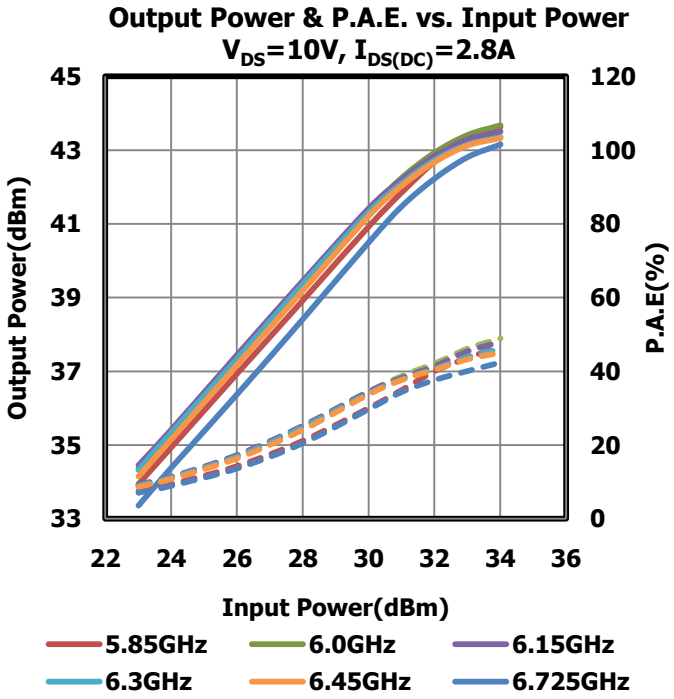
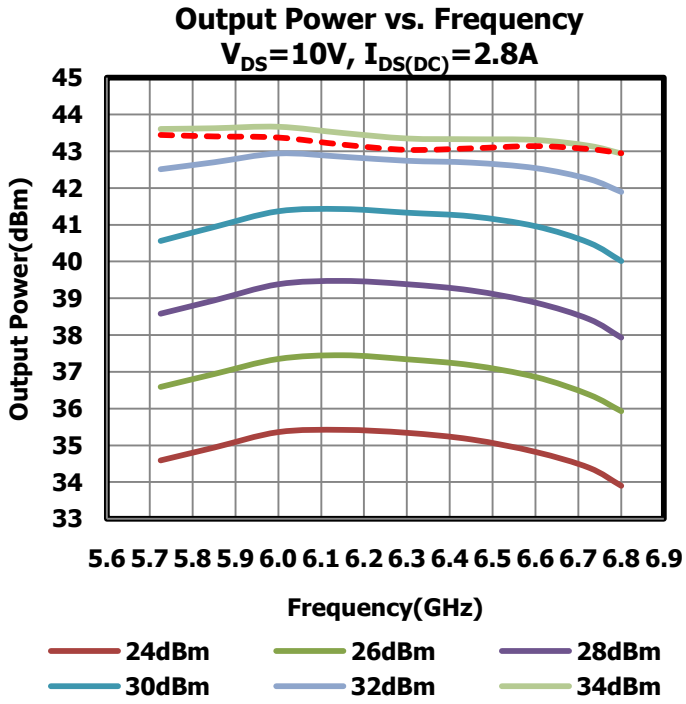
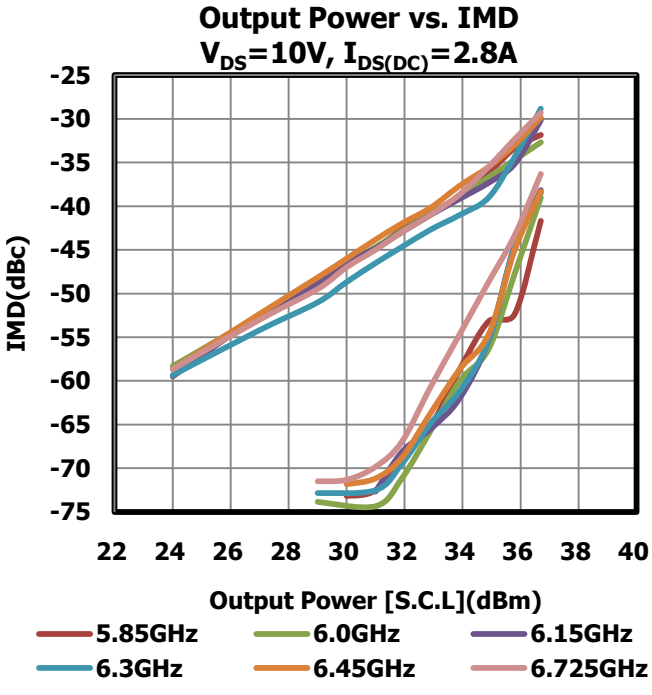
- **RF Characteristics**

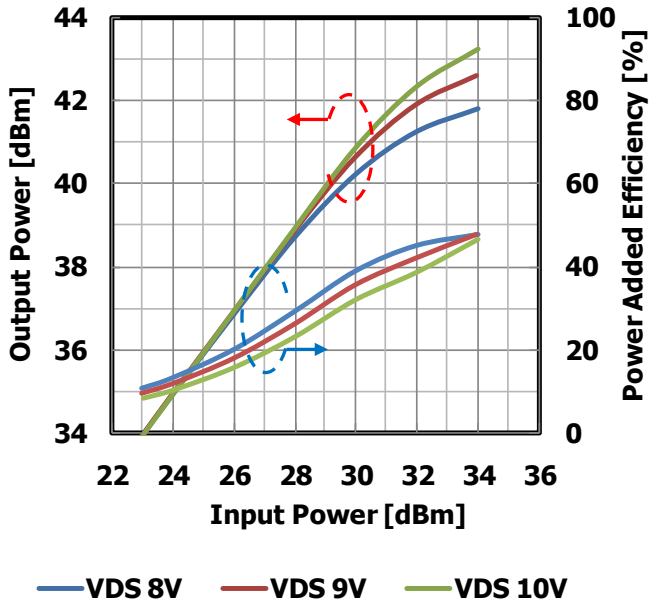








Input Power vs. Output Power, Power Added Efficiency by Drain Voltage
$I_{DS(DC)}$=2800mA @5.9GHz



VDS 8V VDS 9V VDS 10V

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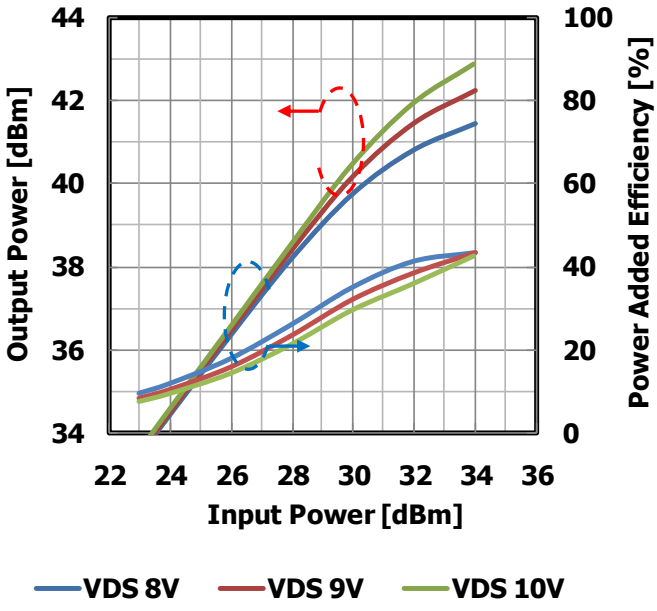
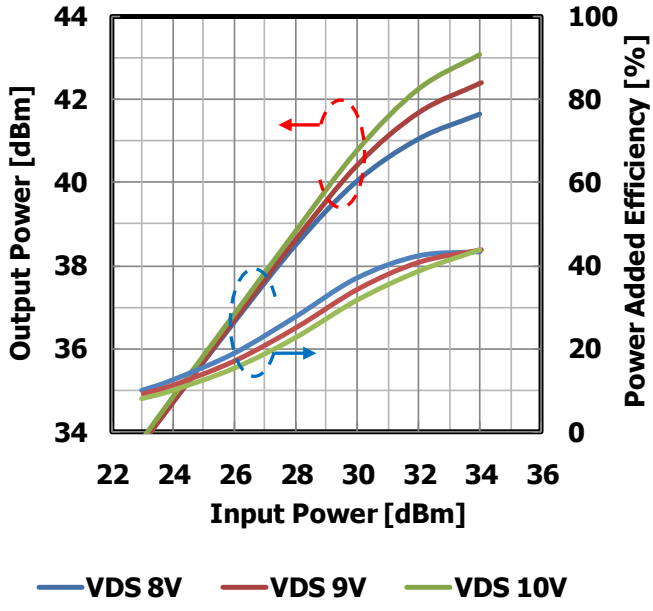


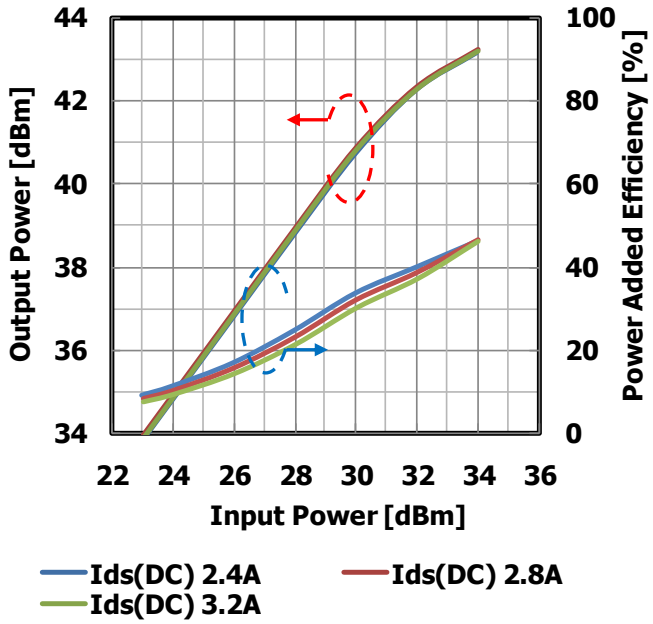
VDS 8V VDS 9V VDS 10V

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



VDS 8V VDS 9V VDS 10V

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



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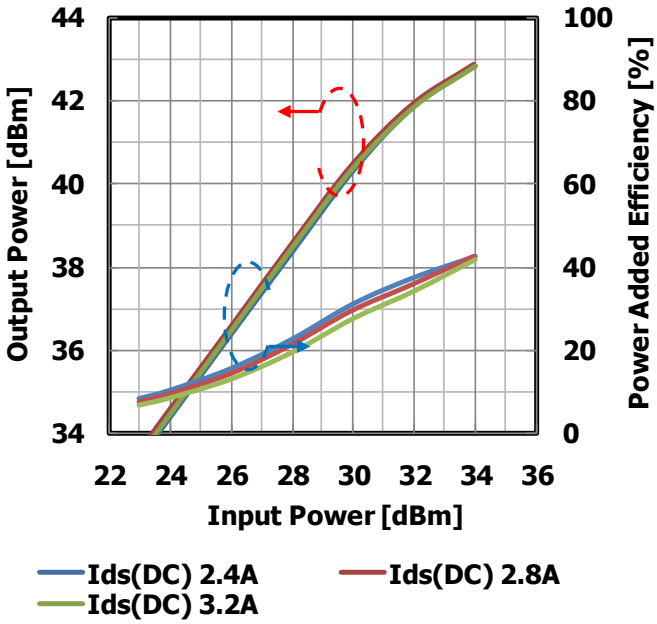

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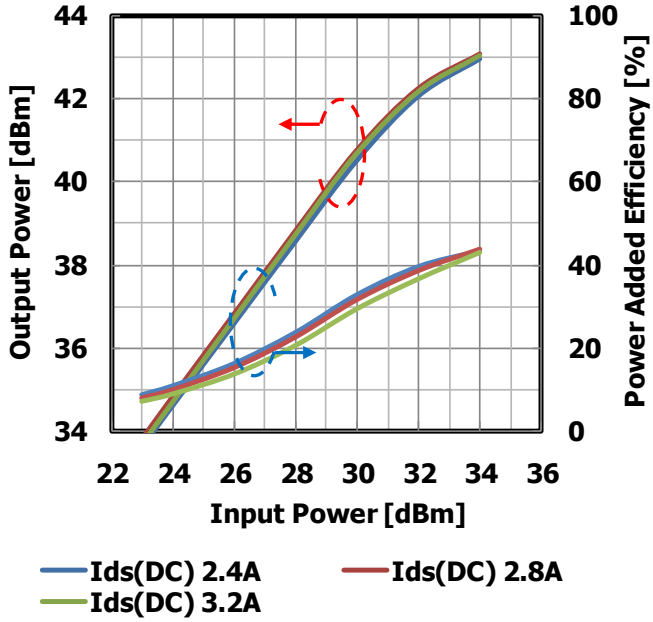
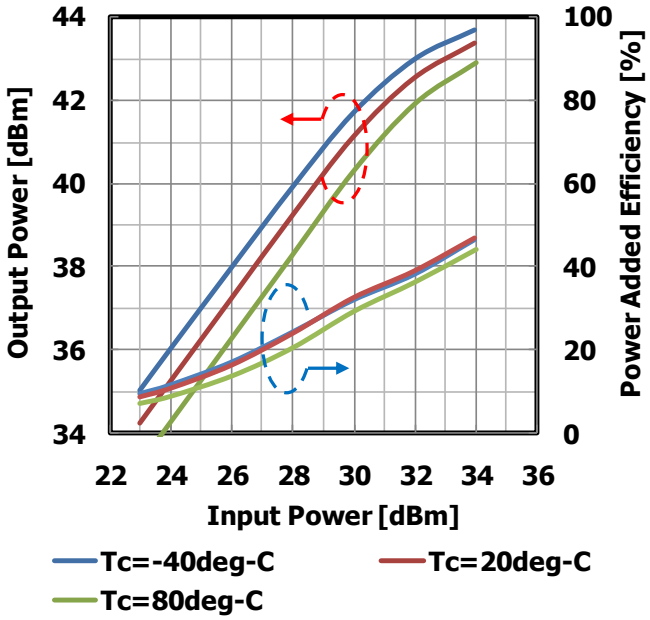


Input Power vs. Output Power, Power Added Efficiency by Temperature
V_{DS}=10V, $I_{DS(DC)}$=2800mA @5.9GHz



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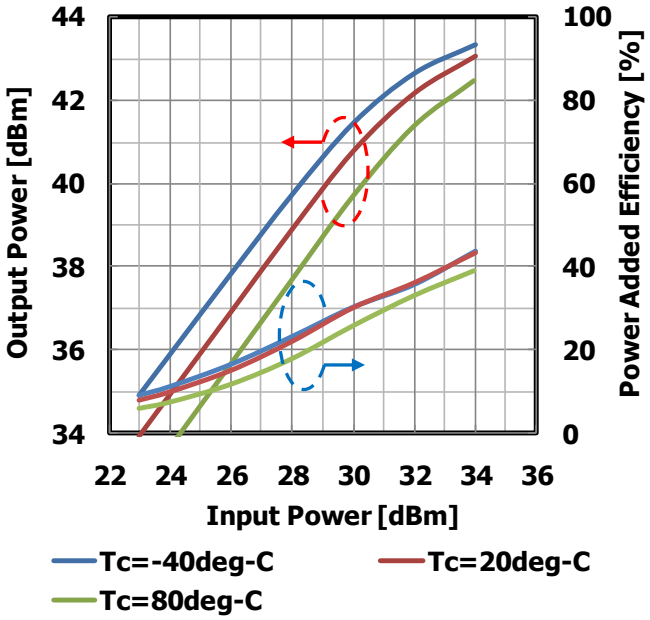

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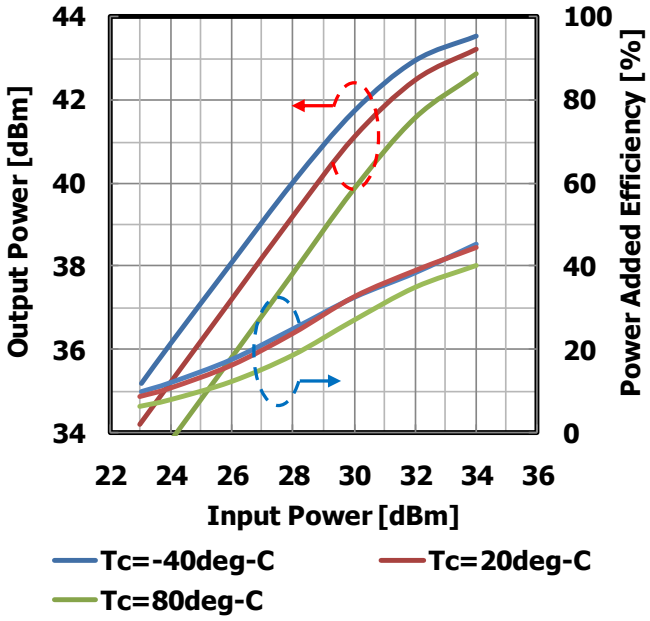
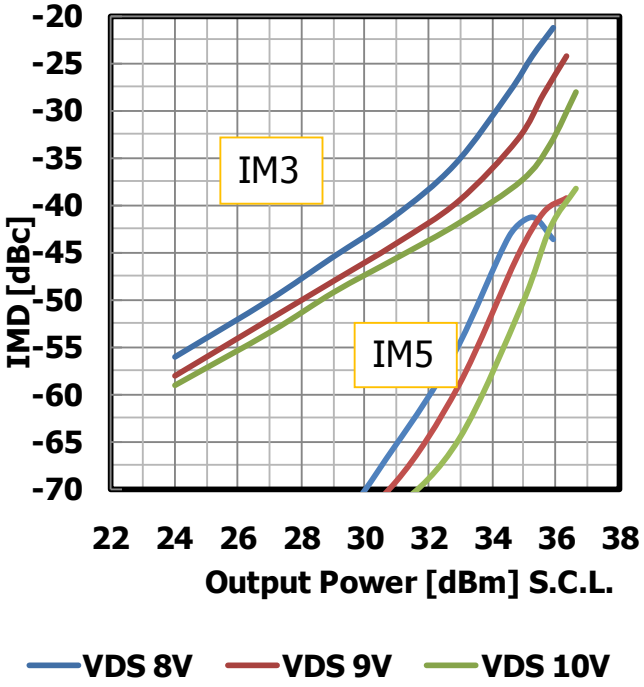


IMD Performance vs. Output Power by Drain Voltage
$I_{DS(DC)}$=2800mA @5.9GHz



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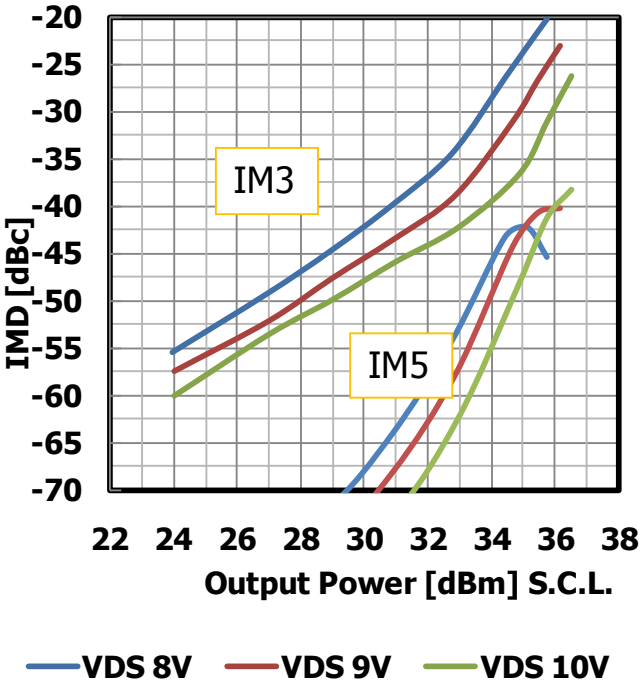

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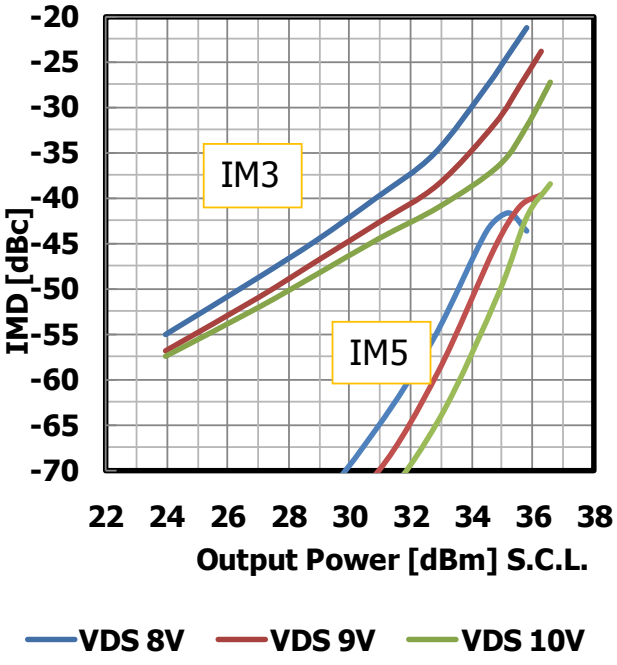
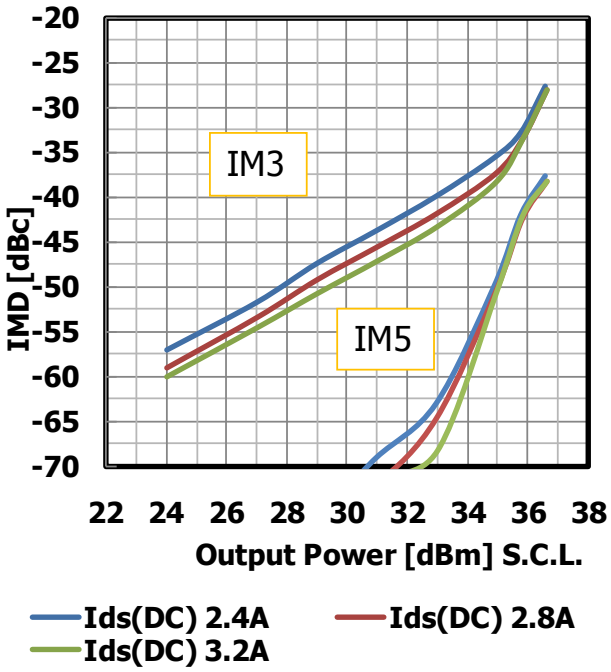


IMD Performance vs. Output Power by Quiescent Drain Current V_{DS}=10V @5.9GHz



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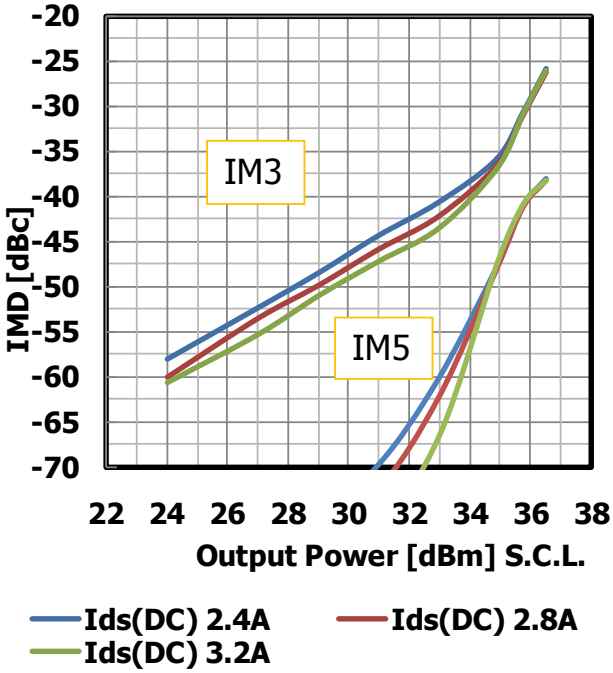

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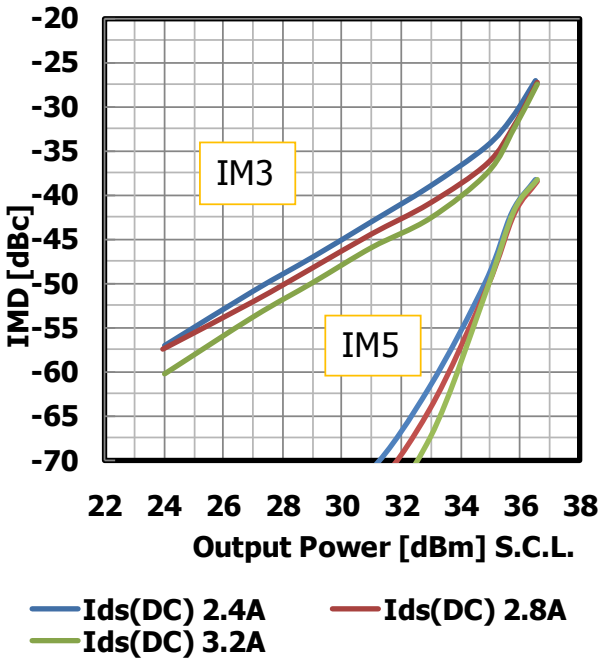
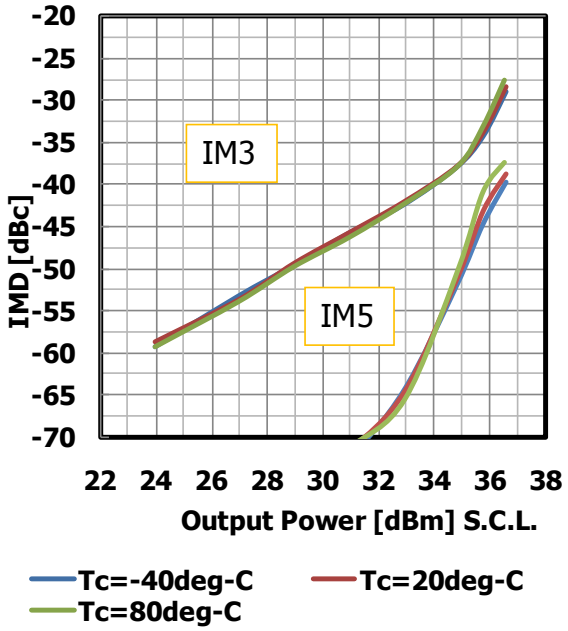


IMD Performance vs. Output Power by Temperature
V_{DS}=10V, $I_{DS(DC)}$=2800mA @5.9GHz



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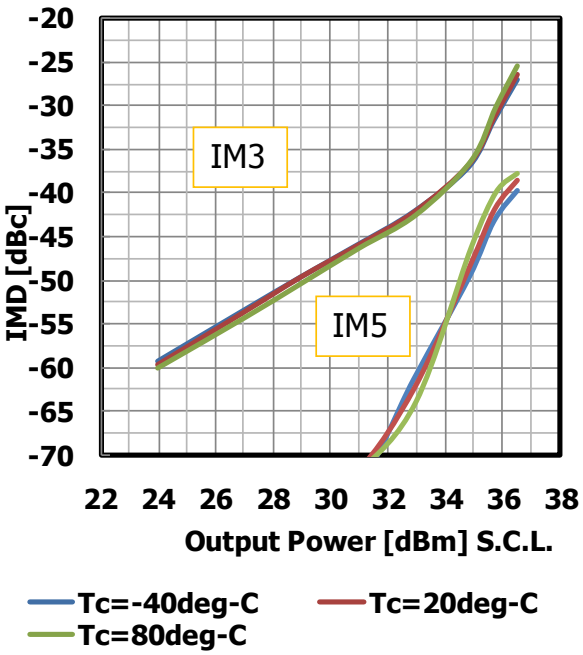

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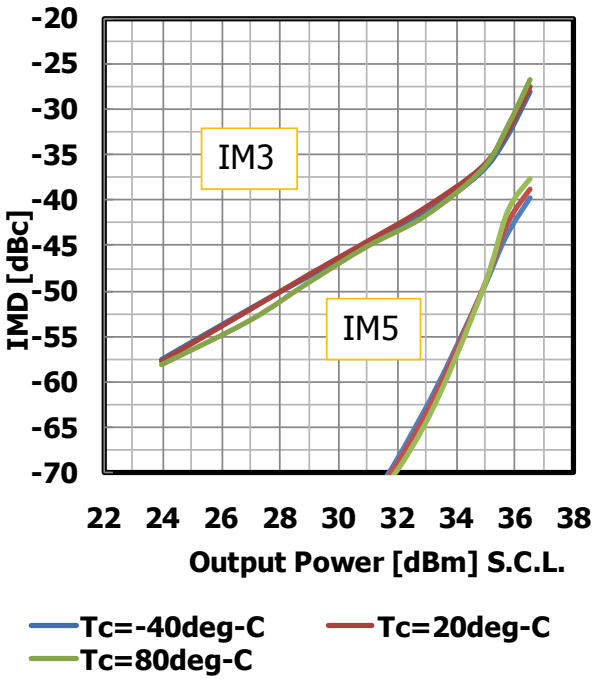
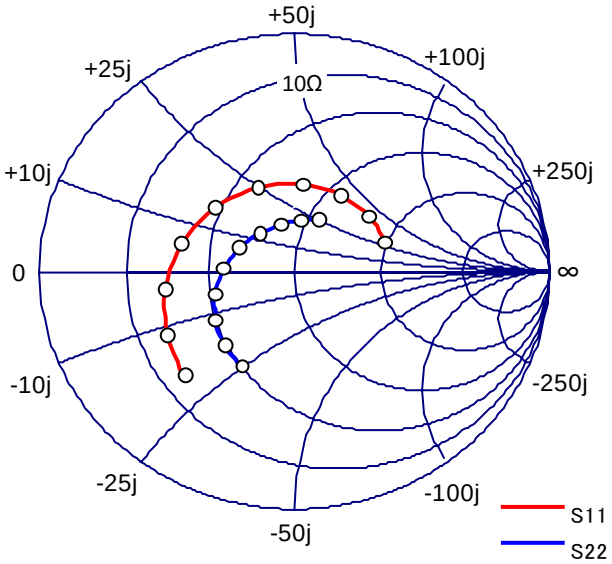
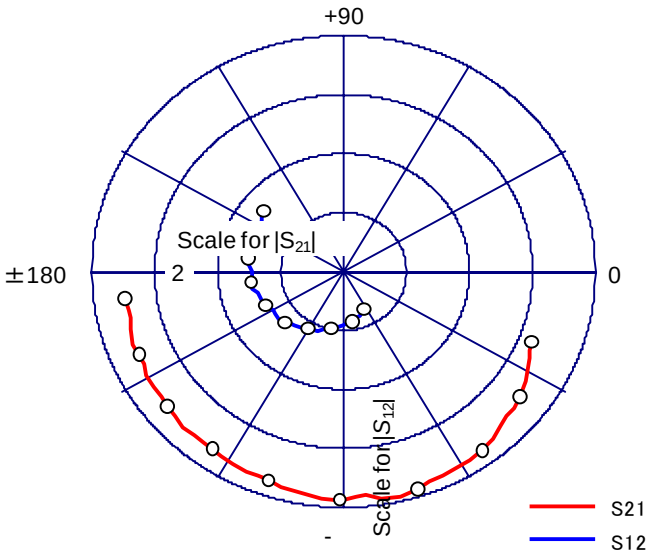


S-Parameter





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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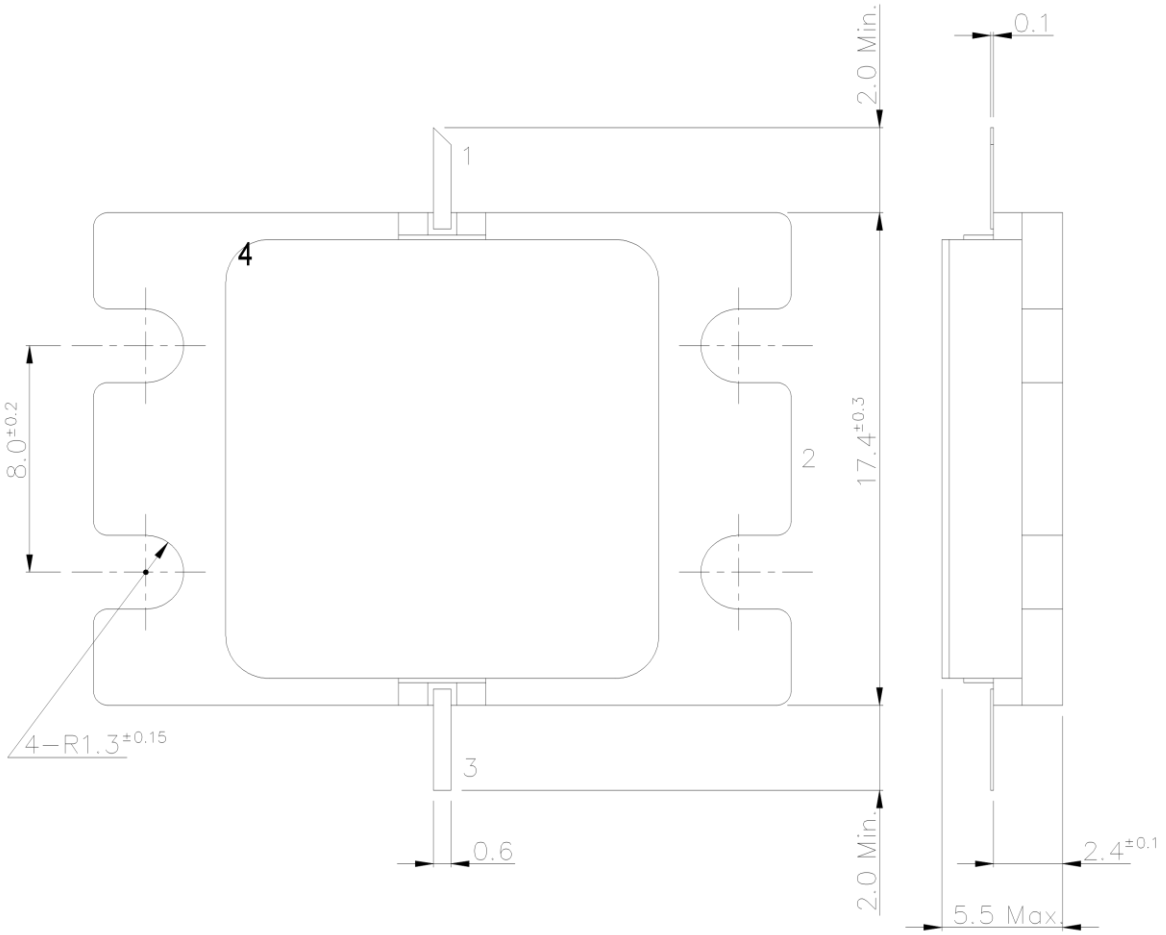
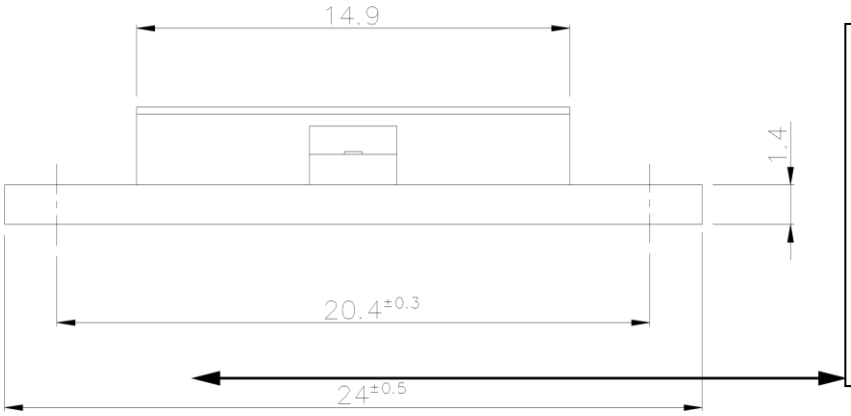
- **Package Out Line**

  Case Style: IK





PIN ASSIGMENT
1 : GATE
2 : SOURCE
3 : DRAIN
4 : SOURCE
Unit : mm

For further information please contact:

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- Sumitomo Electric Device Innovations, 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.