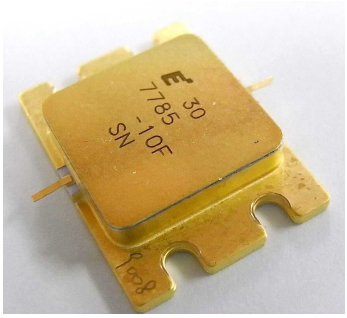
ELM7785-10F

C-band Internally Matched FET

FEATURES

- High Output Power : P1dB=40.5dBm(typ.)
- High Gain : G1dB=8.5dB(typ.)
- High P.A.E. : η add=37%(typ.)
- Broad Band : 7.7 - 8.5GHz
- Impedance Matched Zin/Zout = 50Ω
- Hermetically Sealed Package



DESCRIPTION

The ELM7785-10F is a power GaAs FET that is internally matched for standard communication bands to provide optimum power and gain in a 50Ω system.

SEDI's stringent Quality Assurance Program assures the highest reliability and consistent performance.

ABSOLUTE MAXIMUM RATING

Item	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	15	V
Gata-Source Voltage	V_{GS}	-5	V
Total Power Dissipation	P_T	42.8	W
Storage Temperature	T_{STG}	-65 to +175	deg-C
Channel Temperature	T_{CH}	+ 175	deg-C

RECOMMENDED OPERATING CONDITIONS

Item	Symbol	Condition	Recommend	Unit
DC input Voltage	V_{DS}		< 10	V
Forward Gate Current	I_{GF}	R_G=51Ω	< +27.0	mA
Reverse Gate Current	I_{GR}	R_G=51Ω	< -5.8	mA
Storage Temperature	T_{STG}		-55 to +125	deg-C
Channel Temperature	T_{CH}		+ 155	deg-C

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

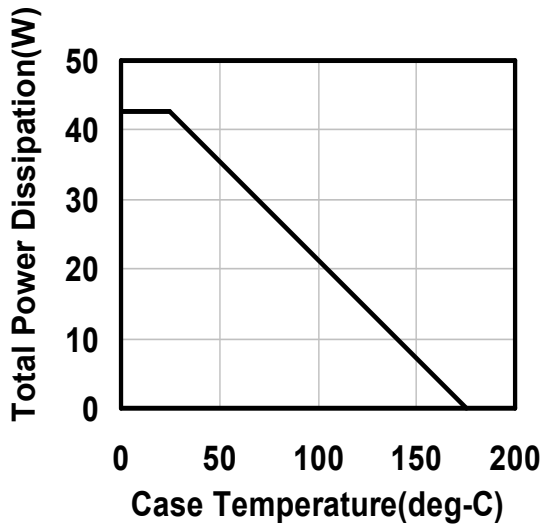
Item	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Drain Current	I_{DSS}	V_{DS}=5V, V_{GS}=0V	—	4000	5600	mA
Transconductance	gm	V_{DS}=5V, I_{DS}=2400mA	—	4000	—	mS
Pinch-off Voltage	V_P	V_{DS}=5V, I_{DS}=240mA	-0.5	-1.5	-3.0	V
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS}=-240uA	-5	—	—	V
Frequency Range	f	VDS=10V	7.7	—	8.5	GHz
Output Power at 1dB G.C.P.	P_{1dB}	IDS(DC)=2600mA(typ.)	39.5	40.5	—	dBm
Power Gain at 1dB G.C.P.	G_{1dB}	Zs=Zl=50Ω	7.5	8.5	—	dB
Drain Current at 1dB G.C.P.	Idsr		—	2600	3000	mA
Power Added Efficiency	η_{add}		—	37	—	%
Gain Flatness	dG		—	—	1.2	dB
3rd Order Inter Modulation Distortion	IM_3	f=8.5GHz, df=10MHz, 2-Tone Test Pout=29.0dBm (S.C.L.)	-44	-46	—	dBc
Thermal Resistance	Rth	Channel to Case	—	3.0	3.5	deg-C/W
Channel Temperature Rise	d-Tch	(V_{DS} x Idsr - P_{OUT} + P_{IN}) x Rth	—	—	100	deg-C

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

Note : RF-Test is measured with Vgs-Constant Circuit

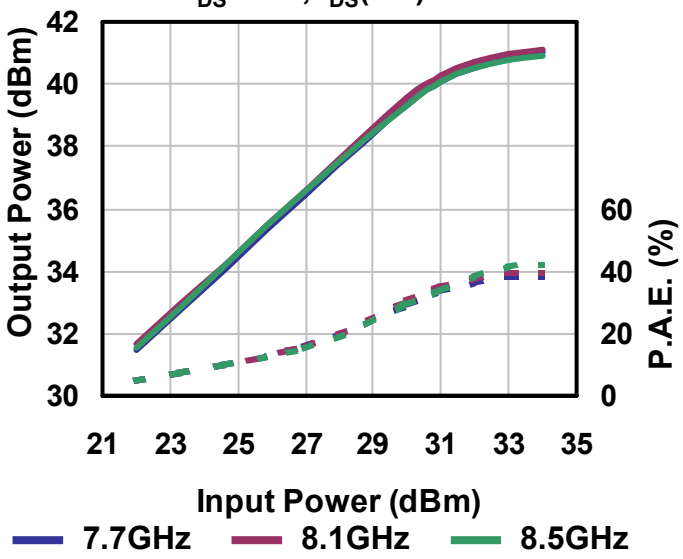
ESD	class 3A	@JEDEC JESD22-A114C.01 (C=100pF, R=1500Ω)
CASE STYLE	IK	
RoHS Compliance	Yes	

Power Derating Curve



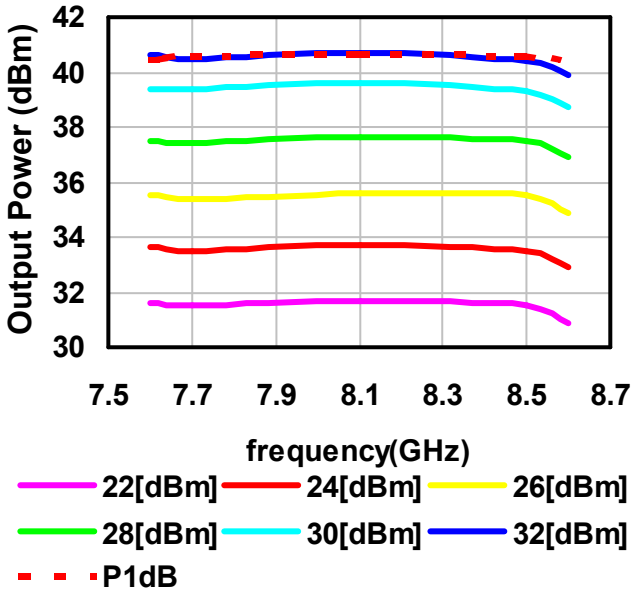
Output Power & P.A.E. v.s. Input Power

V_{DS}=10V, I_{DS}(DC)=2.6A



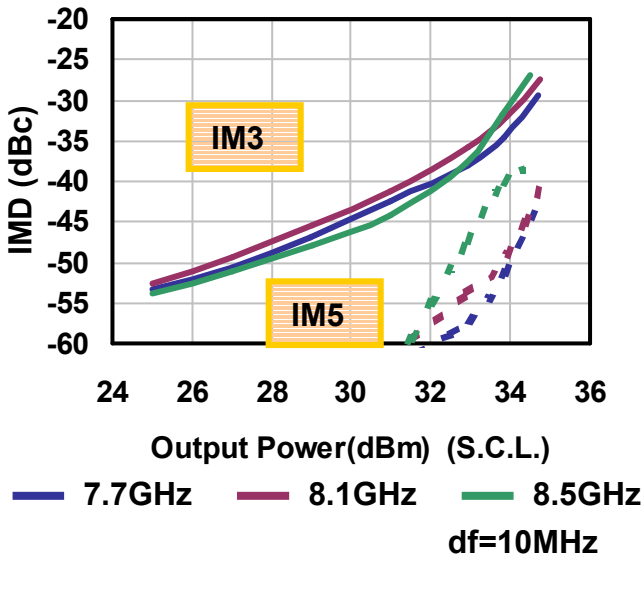
Output Power v.s. Frequency

V_{DS}=10V, I_{DS}(DC)=2.6A



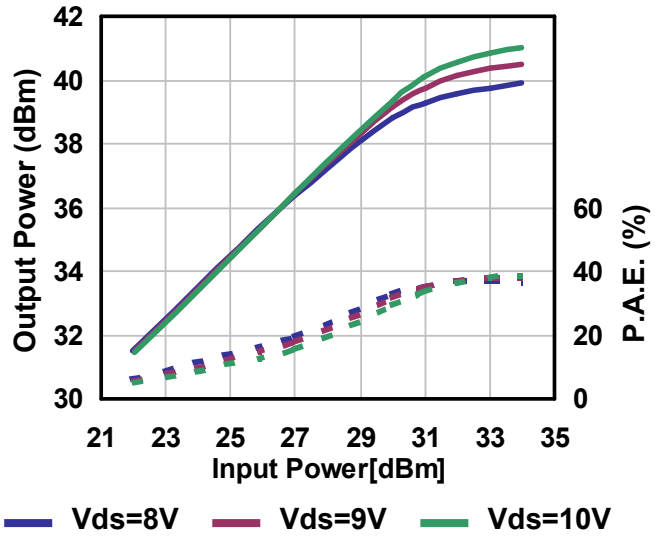
IMD v.s. Output Power

V_{DS}=10V, I_{DS}(DC)=2.6A



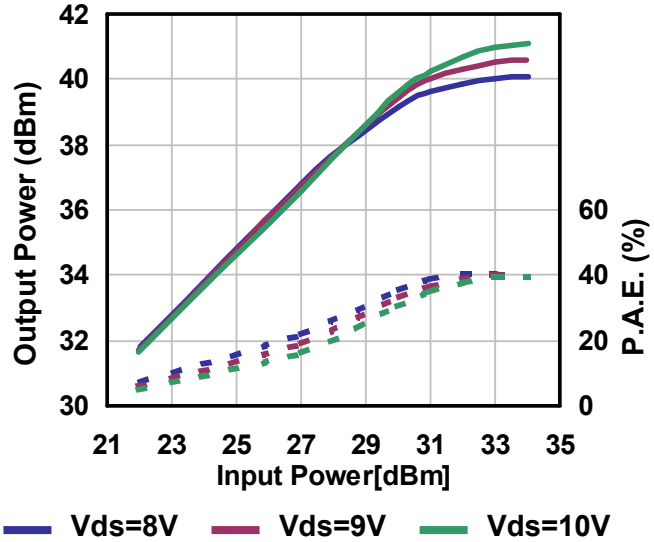
Output Power & P.A.E.
v.s. Input Power by Drain Voltage

I_{DS}(DC)=2.6A@7.7GHz



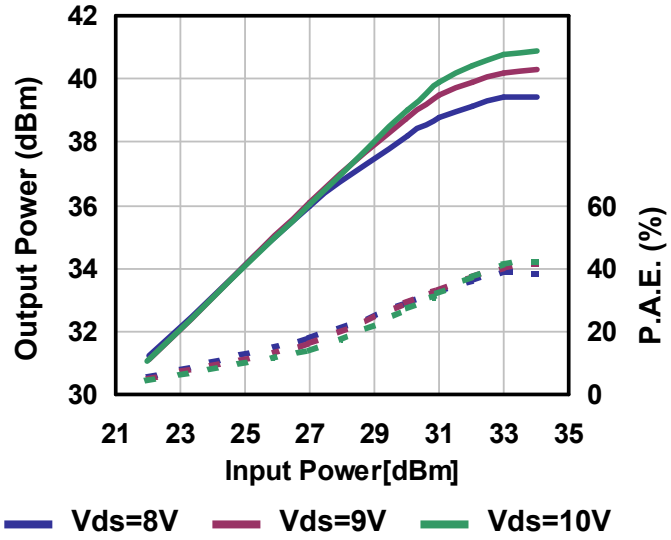
Output Power & P.A.E.
v.s. Input Power by Drain Voltage

I_{DS}(DC)=2.6A@8.1GHz

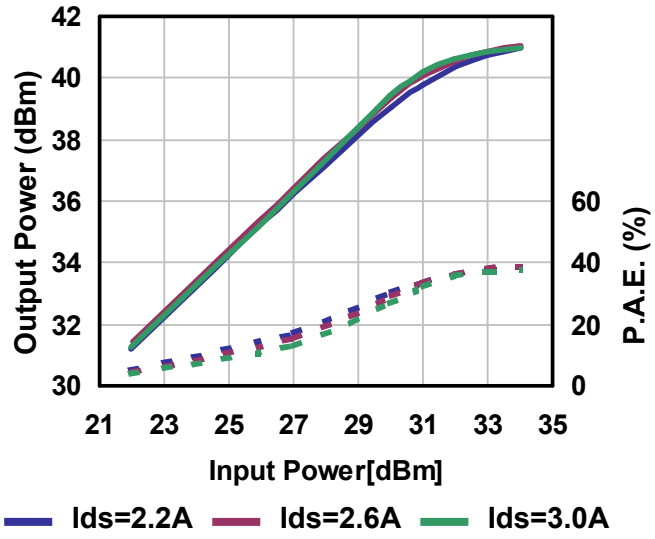


Output Power & P.A.E.
v.s. Input Power by Drain Voltage

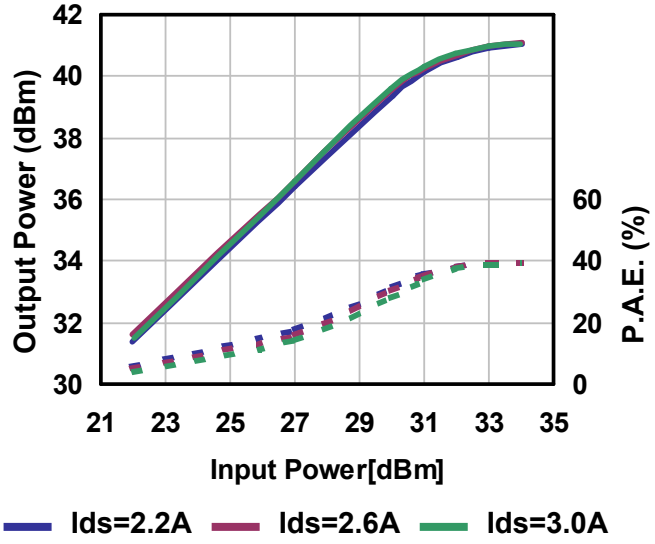
I_{DS}(DC)=2.6A@8.5GHz



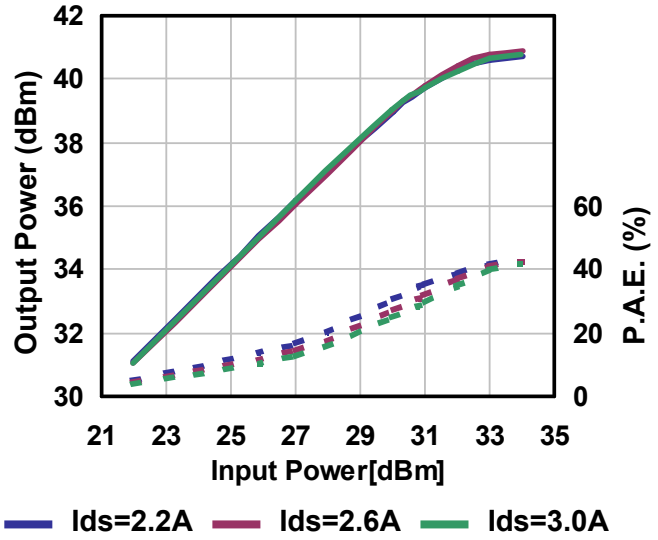
Output Power & P.A.E. v.s. Input Power by Quiescent Drain Current
V_{DS}(DC)=10V@7.7GHz



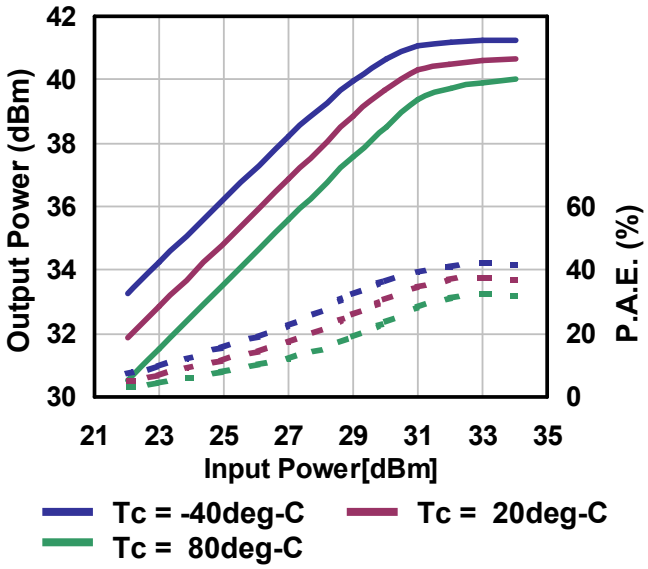
Output Power & P.A.E. v.s. Input Power by Quiescent Drain Current
V_{DS}(DC)=10V@8.1GHz



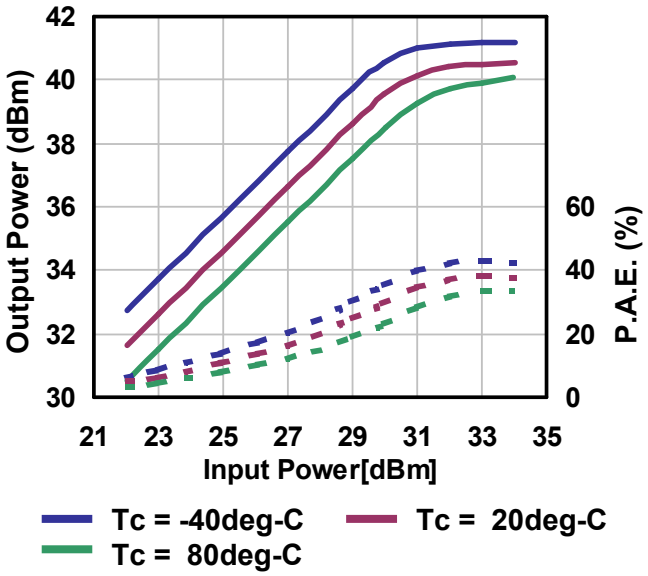
Output Power & P.A.E. v.s. Input Power by Quiescent Drain Current
V_{DS}(DC)=10V@8.5GHz



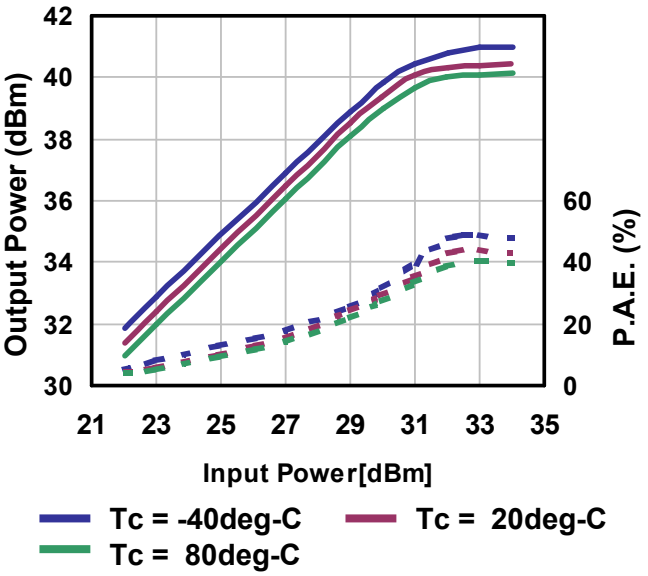
Output Power & P.A.E. v.s. Input Power by Temperature
V_{DS}(DC)=10V, IDS(DC)=2.6A@7.7GHz



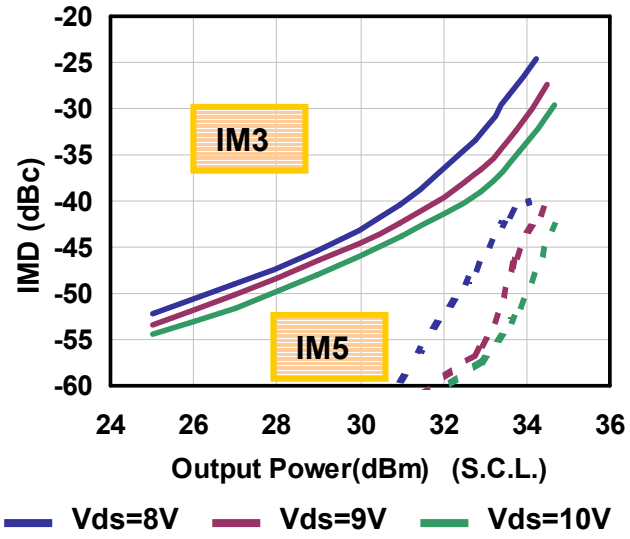
Output Power & P.A.E. v.s. Input Power by Temperature
V_{DS}(DC)=10V, IDS(DC)=2.6A@8.1GHz



Output Power & P.A.E. v.s. Input Power by Temperature
V_{DS}(DC)=10V, IDS(DC)=2.6A@8.5GHz



IMD v.s. Output Power by Drain Voltage
I_{DS}(DC)=2.6A@7.7GHz



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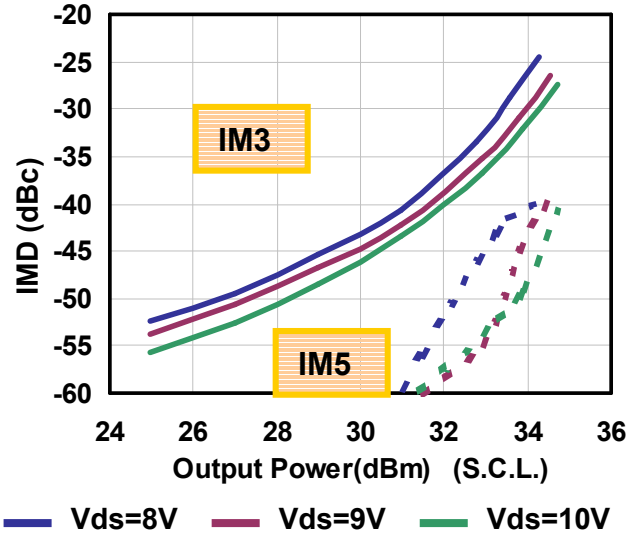

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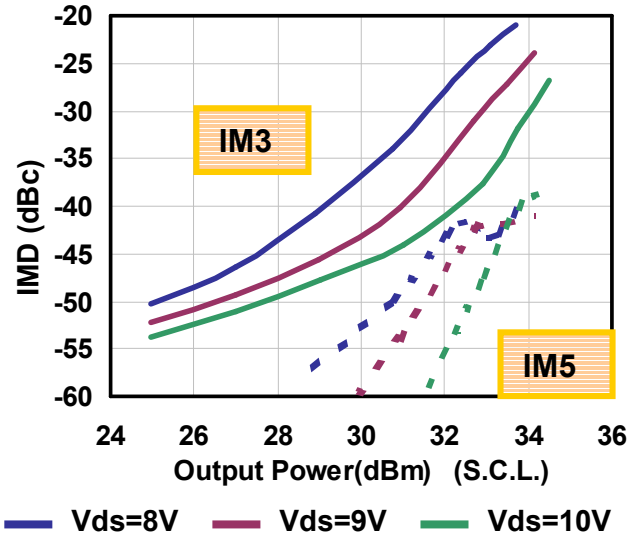
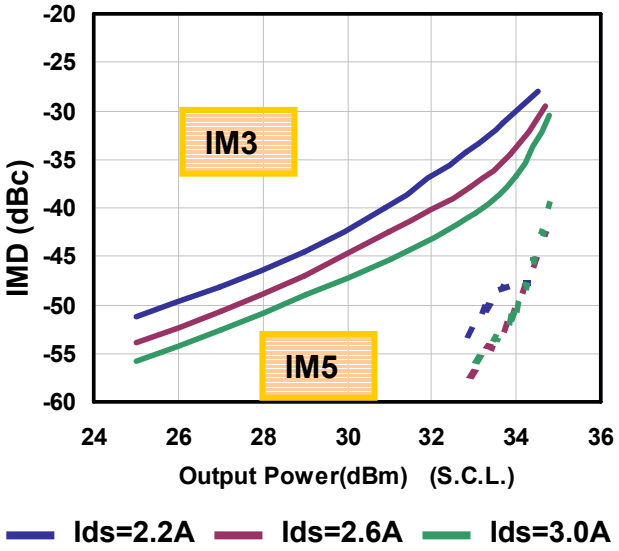
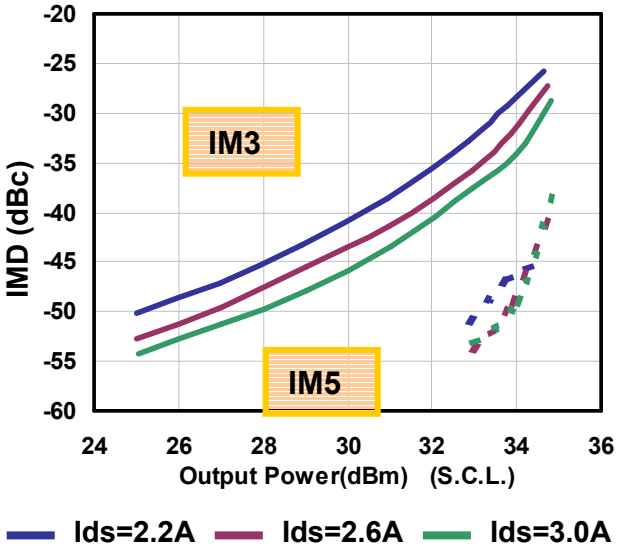


IMD v.s. Output Power
by Quiescent Drain Current
V_{DS}(DC)=10V@7.7GHz



IMD v.s. Output Power
by Quiescent Drain Current
V_{DS}(DC)=10V@8.1GHz



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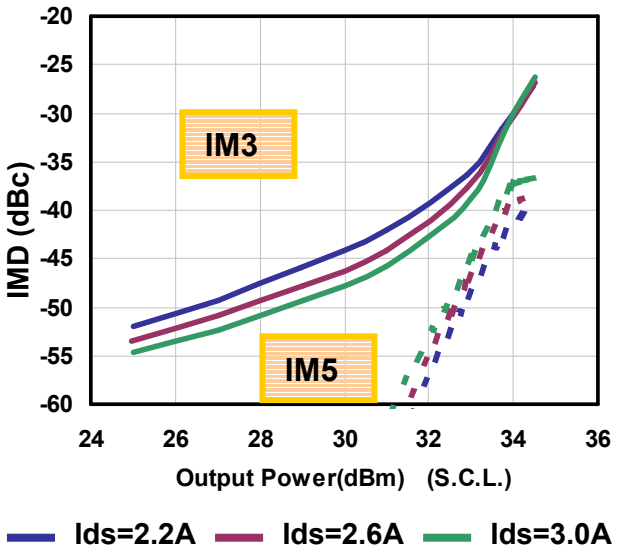
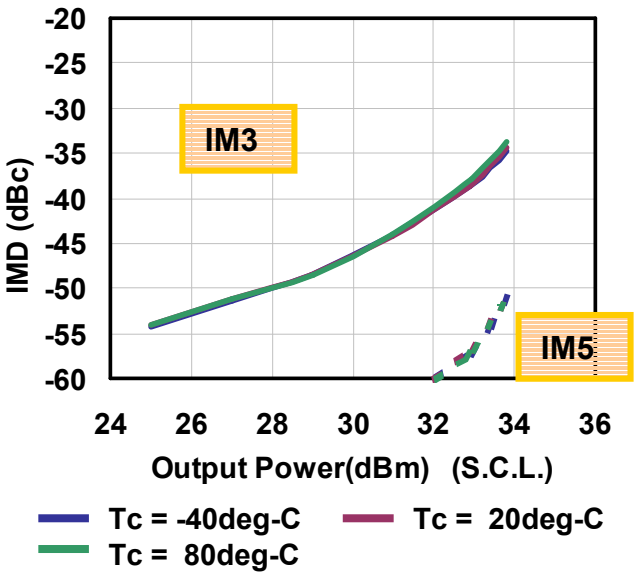
by Quiescent Drain Current
V_{DS}(DC)=10V@8.5GHz



IMD v.s. Output Power by Temperature
V_{DS}(DC)=10V, I_{DS}(DC)=2.6A @ 7.7GHz



IMD v.s. Output Power by Temperature
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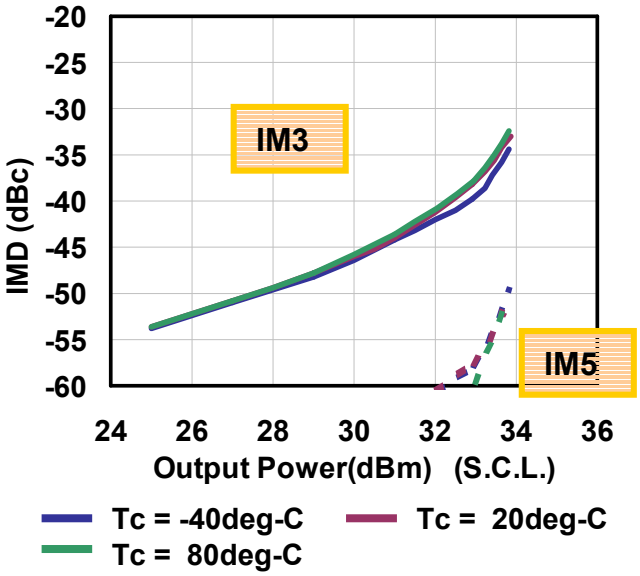
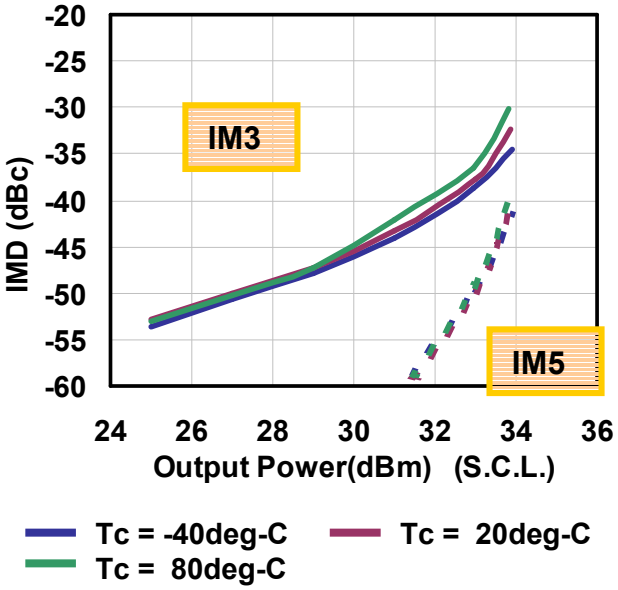
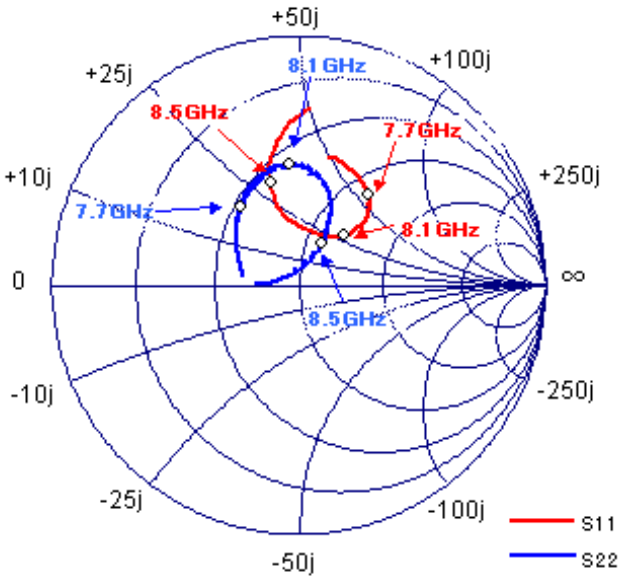
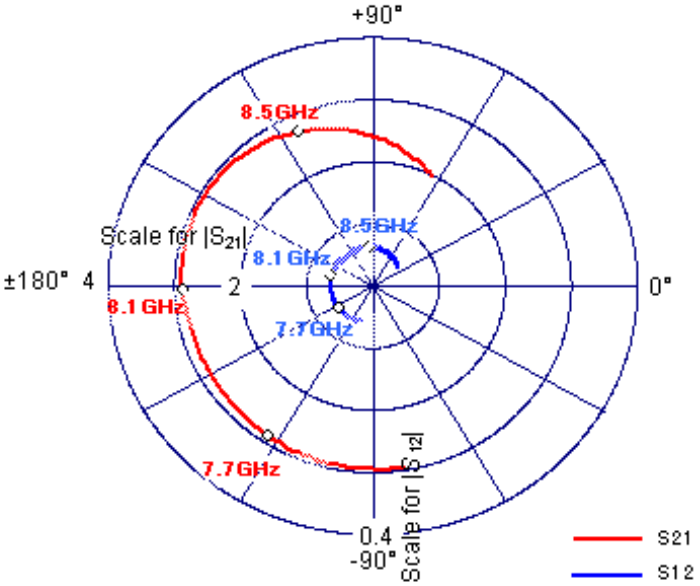


IMD v.s. Output Power by Temperature
V_{DS}(DC)=10V, I_{DS}(DC)=2.6A @ 8.5GHz



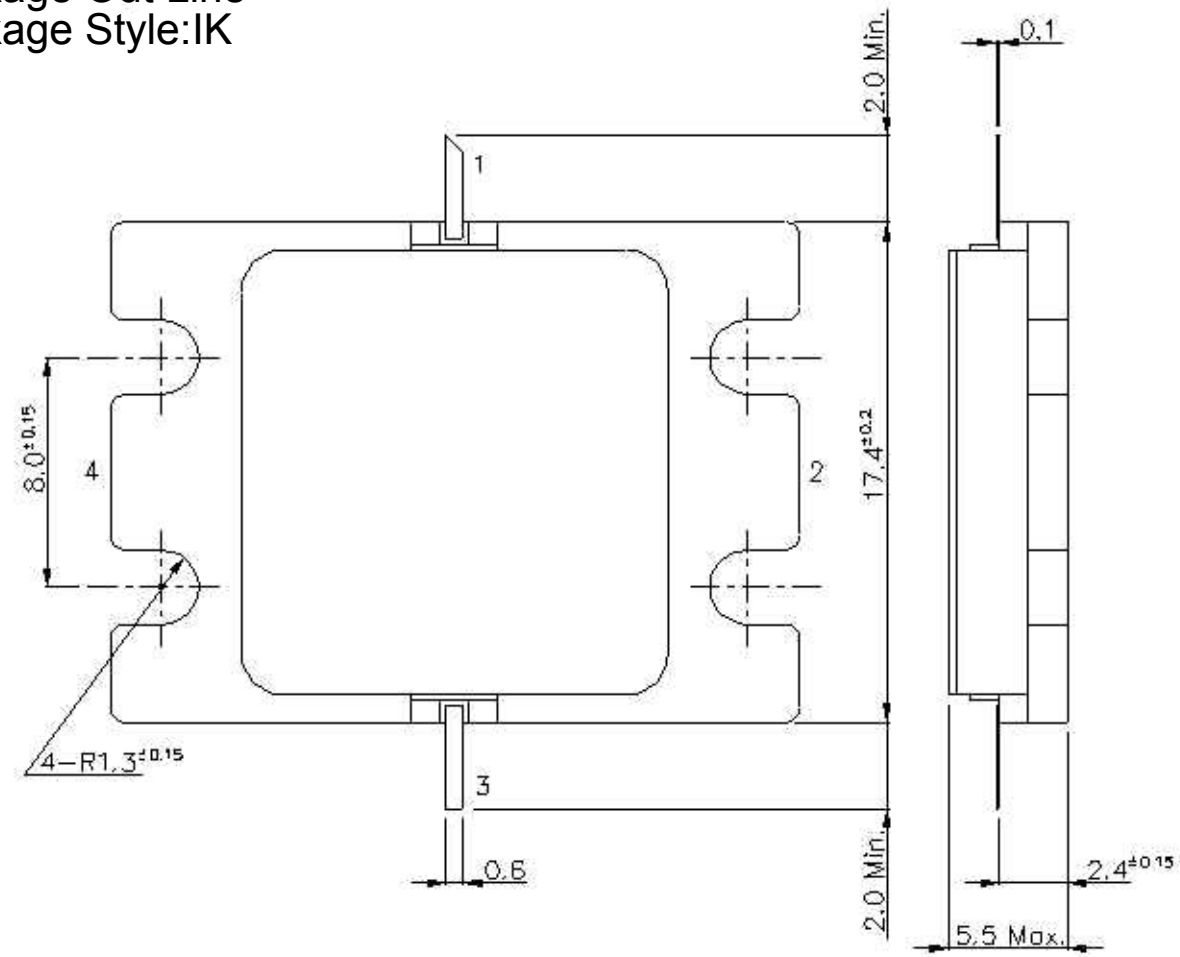
S-parameter

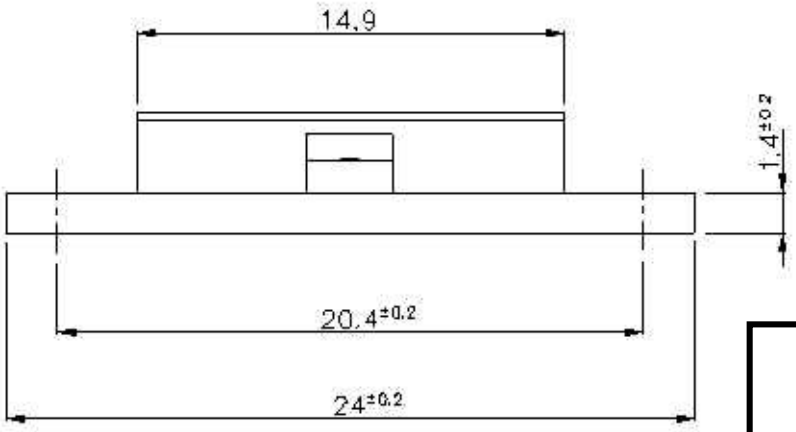




FREQ.	S11		S21		S12		S22	
(GHz)	mag	angle	mag	angle	mag	angle	mag	angle
7.5	0.513	66.6	2.946	-95.7	0.061	-120.5	0.282	150.9
7.6	0.487	57.8	2.914	-110.7	0.062	-133.4	0.343	136.5
7.7	0.458	51.8	2.880	-123.2	0.062	-144.5	0.391	126.4
7.8	0.420	47.1	2.852	-137.4	0.062	-157.6	0.435	116.9
7.9	0.374	44.0	2.832	-151.8	0.062	-170.7	0.467	108.3
8.0	0.330	44.1	2.825	-164.0	0.062	177.8	0.480	101.9
8.1	0.270	46.5	2.871	-178.5	0.064	164.3	0.486	94.2
8.2	0.221	63.5	2.916	165.1	0.064	146.5	0.461	84.2
8.3	0.226	83.5	2.933	149.7	0.061	133.2	0.408	74.3
8.4	0.307	103.6	2.866	130.6	0.064	114.5	0.293	64.2
8.5	0.443	105.0	2.686	111.4	0.062	91.8	0.173	61.3
8.6	0.544	101.0	2.492	95.6	0.058	73.7	0.076	76.7
8.7	0.644	93.9	2.229	78.2	0.053	54.7	0.081	166.2

Package Out Line
Package Style:IK





PIN ASSIGNMENT
1:Gate
2:Source (Flange)
3:Drain
4:Source (Flange)

For further information please contact :

Sumitomo Electric Device Innovations, U.S.A., Inc.
2355 Zanker Rd.
San Jose, CA 95131-1138, U.S.A.
TEL: +1 408 232-9500
FAX: +1 408 428-9111

Sumitomo Electric Europe Ltd.
220 Centennial Park
Elstree WD6 3SL United Kingdom
TEL: +44 (0)20 8953-8118
FAX: +44 (0)20 8953-8228

Sumitomo Electric Europe Ltd. (Italy Branch)
Piazza Don E. Maoelli, 60 - 20099
Sesto San Giovanni, Milano, Italy
TEL: +39-02-496386-01
FAX: +39-02-496386-25

Sumitomo Electric Asia, Ltd.
Room 2624-2637, 26/F.,
Sun Hung Kai Centre,
30 Harbour Road, Wanchai, Hong Kong
TEL: +852-2576-0080
FAX: +852-2576-6412

Sumitomo Electric Device Innovations, Inc.
1000 Kamisukiahara, showa-cho
Nakakomagun, Yamanashi
409-3883, Japan
(Kokubo Industrial Park)
TEL +81-55-275-4411
FAX +81-55-275-9461

Sumitomo Electric Industries, Ltd.
Head Office (Tokyo)
3-9-1, Shibaura, Minato-ku, Tokyo 108-8539,
Japan
TEL +81-3-6722-3283
FAX +81-3-6722-3284

CAUTION

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.