

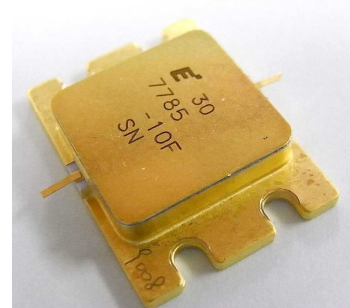
### FEATURES

- High Output Power : P1dB=40.5dBm(typ.)
- High Gain : G1dB=8.5dB(typ.)
- High P.A.E. :  $\eta_{add}$ =37%(typ.)
- Broad Band : 7.7 - 8.5GHz
- Impedance Matched Zin/Zout = 50  $\Omega$
- 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 50  $\Omega$  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
Gate-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	$I_{GF}$	$R_G=51 \Omega$	< +27.0	mA
Reverse Gate Current	$I_{GR}$	$R_G=51 \Omega$	< -5.8	mA
Storage Temperature	$T_{STG}$		-55 to +125	deg-C
Channel Temperature	$T_{CH}$		+ 155	deg-C

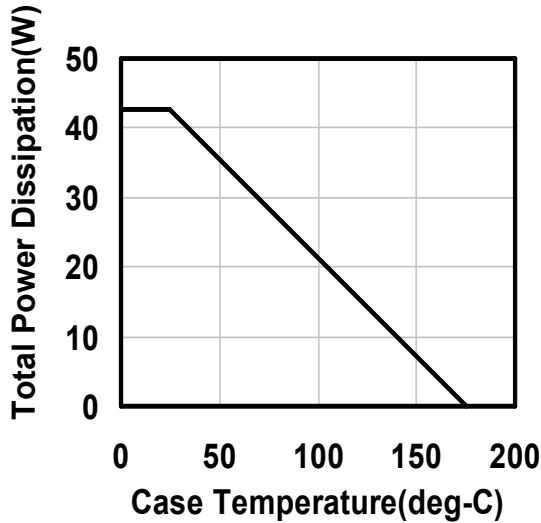
### RECOMMENDED OPERATING CONDITIONS ( Case Temperature $T_c=25$ deg-C )

Item	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Drain Current	$I_{DSS}$	$V_{DS}=5V, V_{GS}=0V$	—	4000	5600	mA
Transconductance	$g_m$	$V_{DS}=5V, I_{DS}=2400mA$	—	4000	—	mS
Pinch-off Voltage	$V_P$	$V_{DS}=5V, I_{DS}=240mA$	-0.5	-1.5	-3.0	V
Gate-Source Breakdown Voltage	$V_{GSO}$	$I_{GS}=-240\mu A$	-5	—	—	V
Frequency Range	$f$	$V_{DS}=10V$	7.7	—	8.5	GHz
Output Power at 1dB G.C.P.	$P_{1dB}$	$I_{DS}(DC)=2600mA$ (typ.)	39.5	40.5	—	dBm
Power Gain at 1dB G.C.P.	$G_{1dB}$	$Z_S=Z_L=50 \Omega$	7.5	8.5	—	dB
Drain Current at 1dB G.C.P.	$I_{dsr}$		—	2600	3000	mA
Power Added Efficiency	$\eta_{add}$		—	37	—	%
Gain Flatness	dG		—	—	1.2	dB
3 <sup>rd</sup> Order Inter Modulation Distortion	$IM_3$	$f=8.5GHz, df=10MHz, 2-Tone Test$ $P_{out}=29.0dBm$ ( S.C.L. )	-44	-46	—	dBc
Thermal Resistance	$R_{th}$	Channel to Case	—	3.0	3.5	deg-C/W
Channel Temperature Rise	$d-T_{ch}$	$(V_{DS} \times I_{dsr} - P_{OUT} + P_{IN}) \times R_{th}$	—	—	100	deg-C

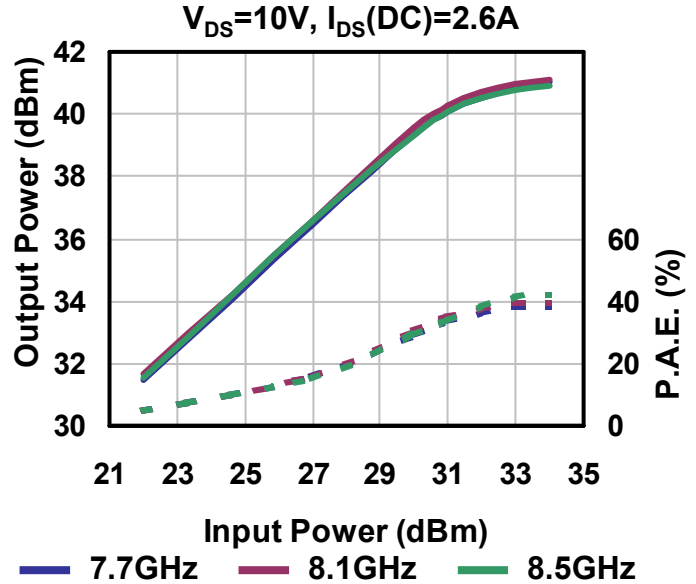
G.C.P. = Gain Compression Point      S.C.L. = Single Carrier Level  
Note : RF-Test is measured with Vgs-Constant Circuit

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

**Power Derating Curve**

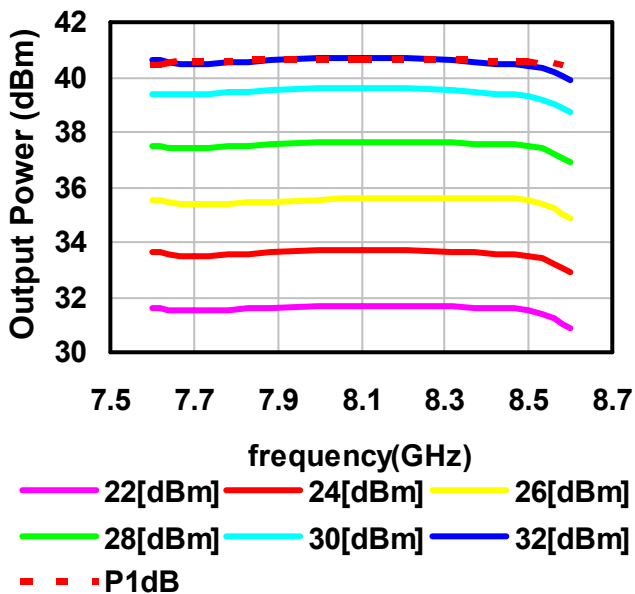


**Output Power & P.A.E. v.s. Input Power**



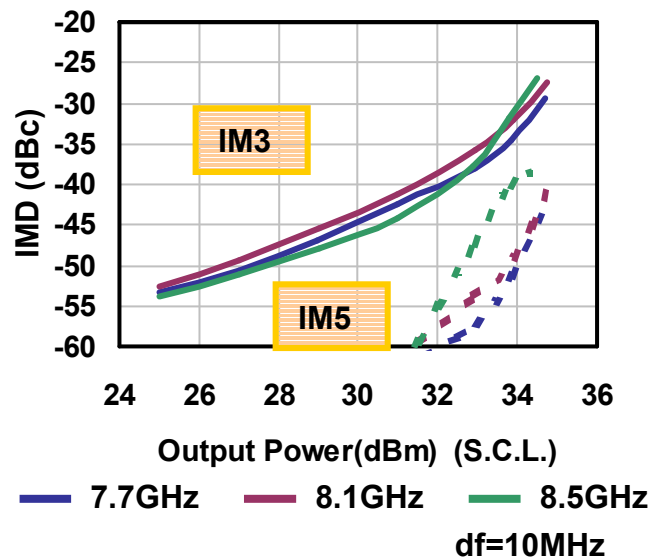
**Output Power v.s. Frequency**

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



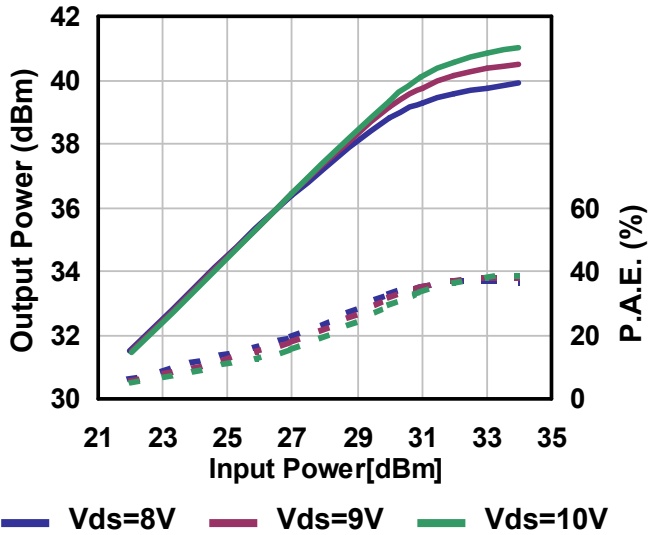
**IMD v.s. Output Power**

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



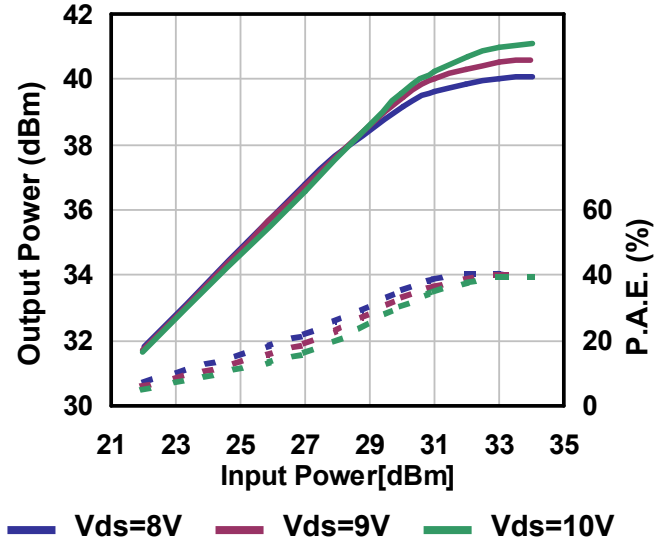
Output Power & P.A.E.  
v.s. Input Power by Drain Voltage

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



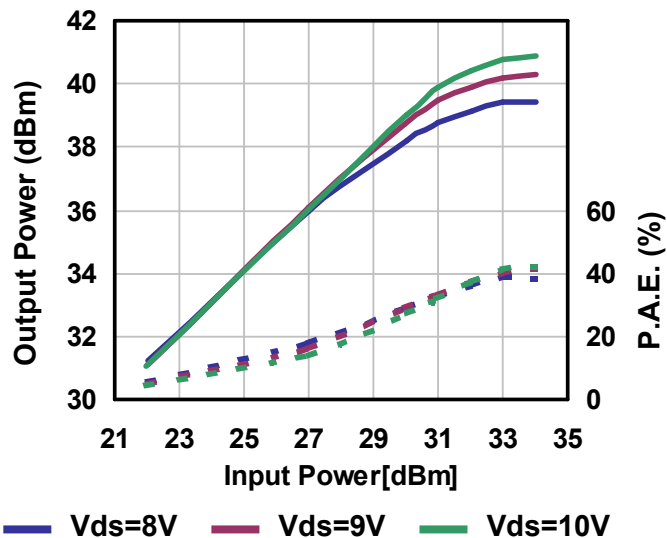
Output Power & P.A.E.  
v.s. Input Power by Drain Voltage

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

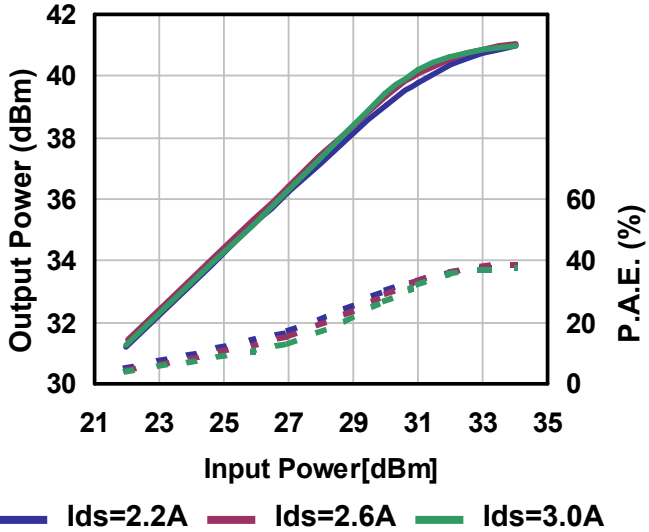


Output Power & P.A.E.  
v.s. Input Power by Drain Voltage

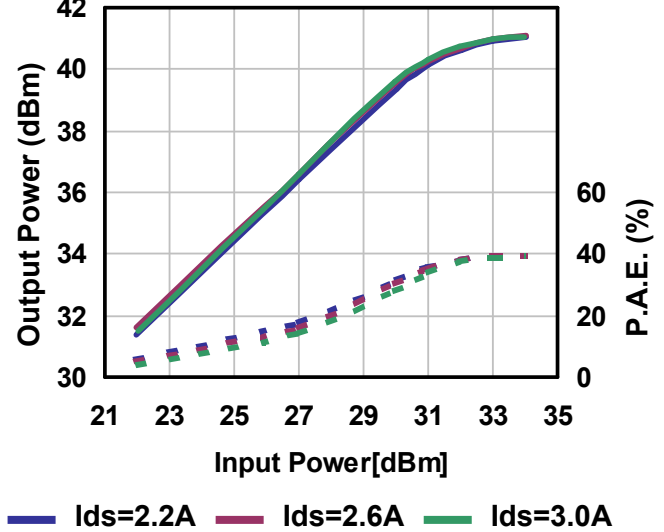
$I_{DS}(DC)=2.6A@8.5GHz$



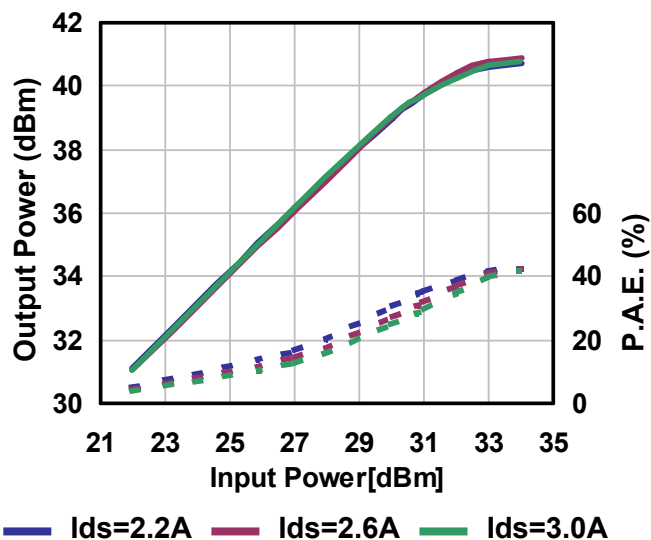
Output Power & P.A.E. v.s. Input Power  
by Quiescent Drain Current  
 $V_{DS}(DC)=10V@7.7GHz$



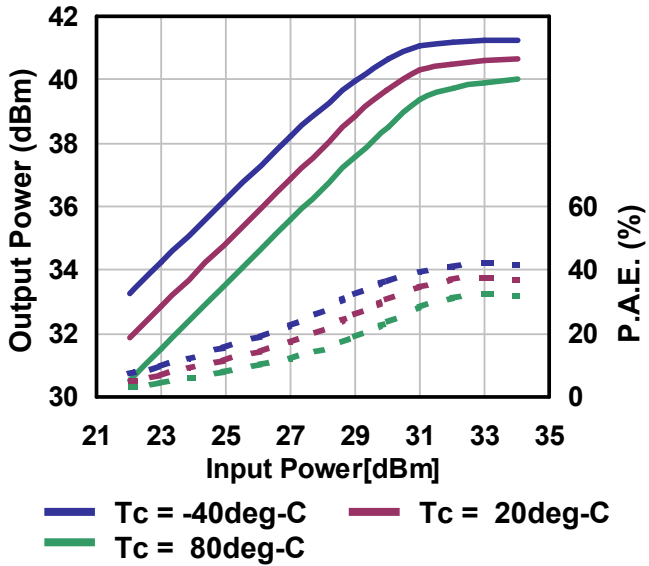
Output Power & P.A.E. v.s. Input Power  
by Quiescent Drain Current  
 $V_{DS}(DC)=10V@8.1GHz$



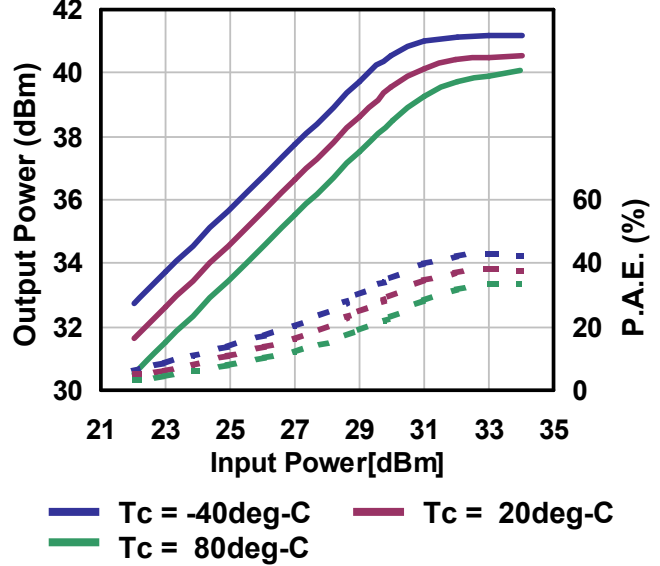
Output Power & P.A.E. v.s. Input Power  
by Quiescent Drain Current  
 $V_{DS}(DC)=10V@8.5GHz$



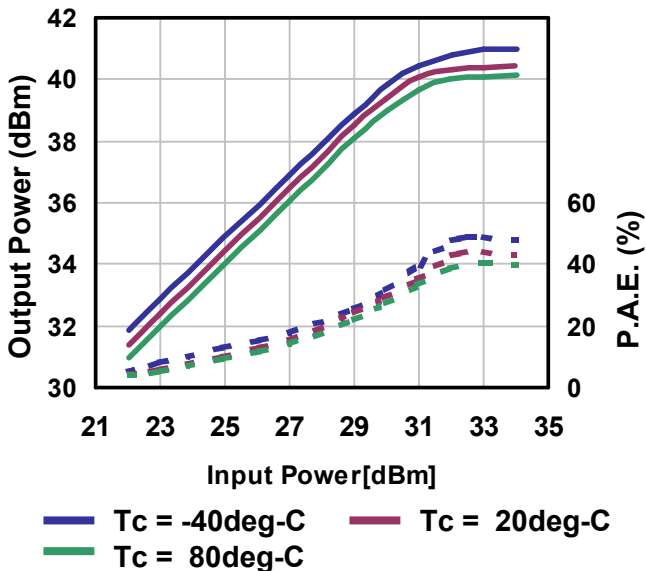
Output Power & P.A.E. v.s. Input Power by Temperature  
 $V_{DS}(DC)=10V, I_{DS}(DC)=2.6A@7.7GHz$



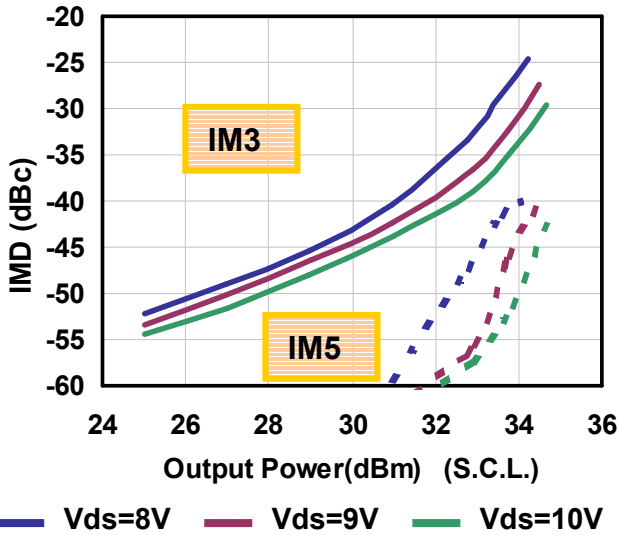
Output Power & P.A.E. v.s. Input Power by Temperature  
 $V_{DS}(DC)=10V, I_{DS}(DC)=2.6A@8.1GHz$



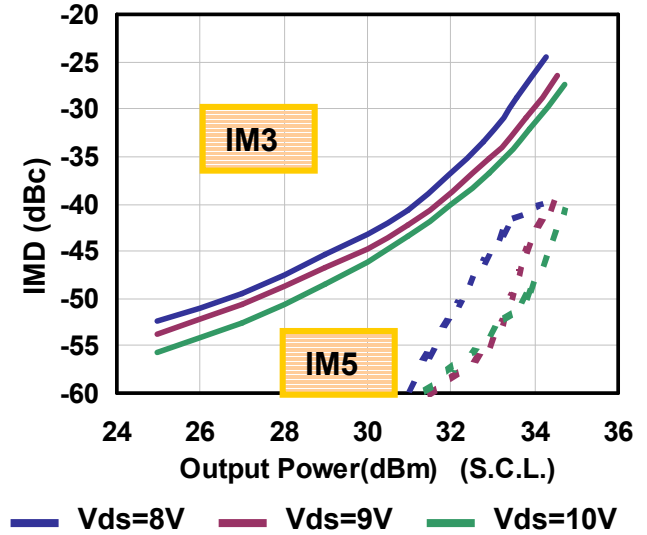
Output Power & P.A.E. v.s. Input Power by Temperature  
 $V_{DS}(DC)=10V, I_{DS}(DC)=2.6A@8.5GHz$



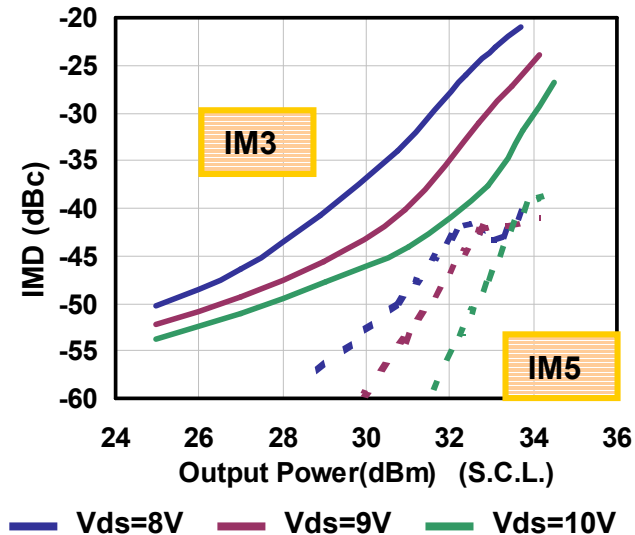
IMD v.s. Output Power by Drain Voltage  
 $I_{DS}(DC)=2.6A@7.7GHz$



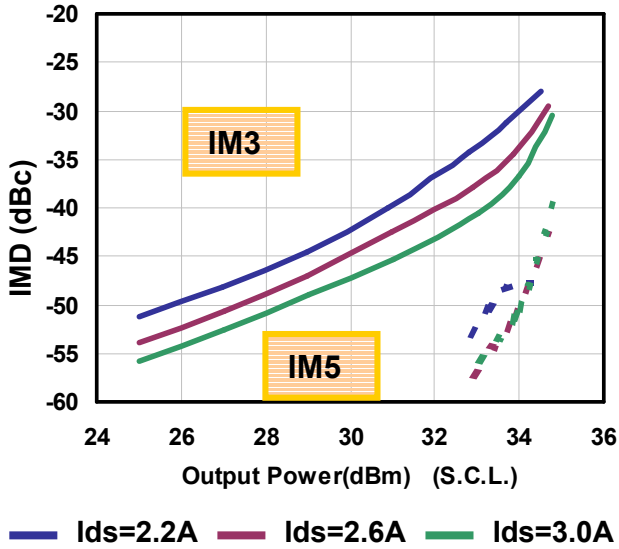
IMD v.s. Output Power by Drain Voltage  
 $I_{DS}(DC)=2.6A@8.1GHz$



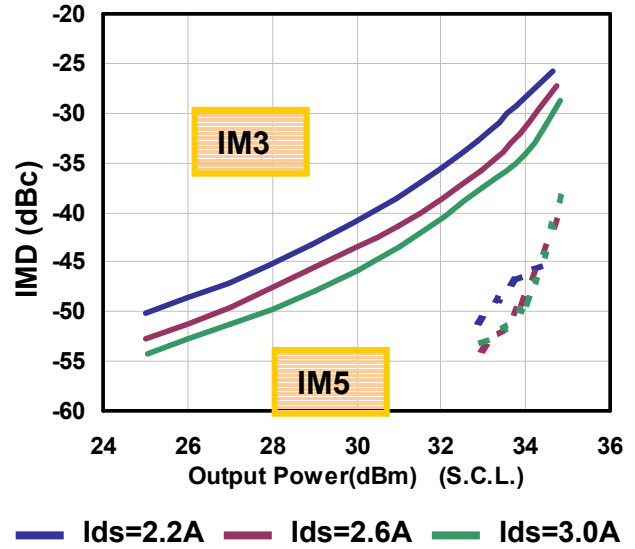
IMD v.s. Output Power by Drain Voltage  
 $I_{DS}(DC)=2.6A@8.5GHz$



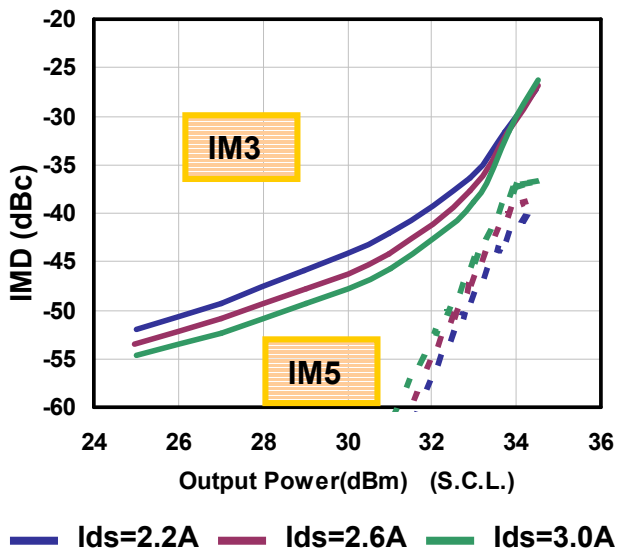
**IMD v.s. Output Power  
by Quiescent Drain Current**  
 $V_{DS}(DC)=10V@7.7GHz$



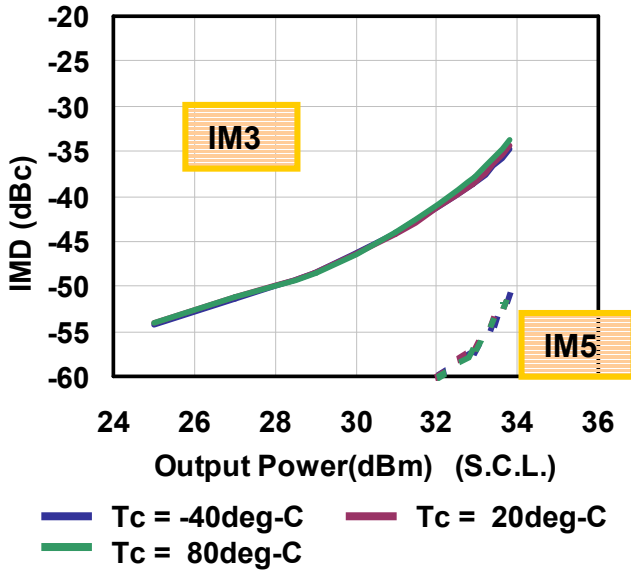
**IMD v.s. Output Power  
by Quiescent Drain Current**  
 $V_{DS}(DC)=10V@8.1GHz$



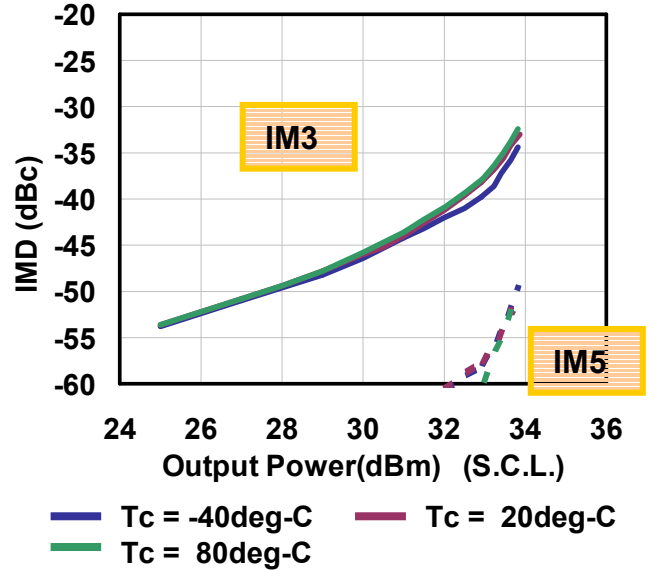
**IMD v.s. Output Power  
by Quiescent Drain Current**  
 $V_{DS}(DC)=10V@8.5GHz$



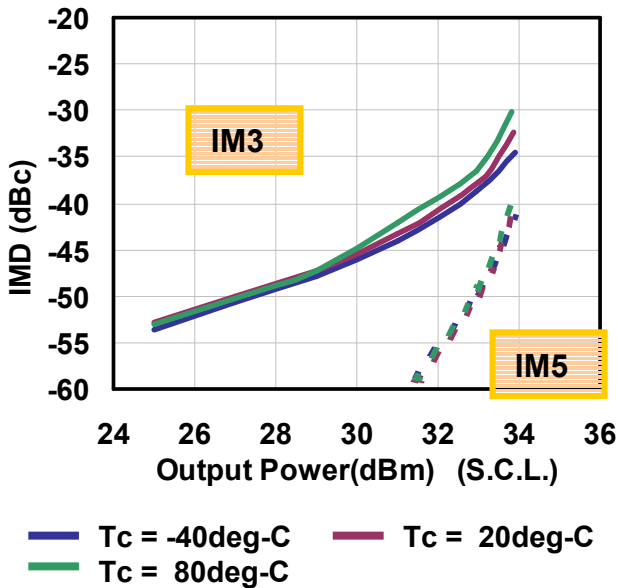
IMD v.s. Output Power by Temperature  
 $V_{DS}(DC)=10V, I_{DS}(DC)=2.6A @ 7.7GHz$



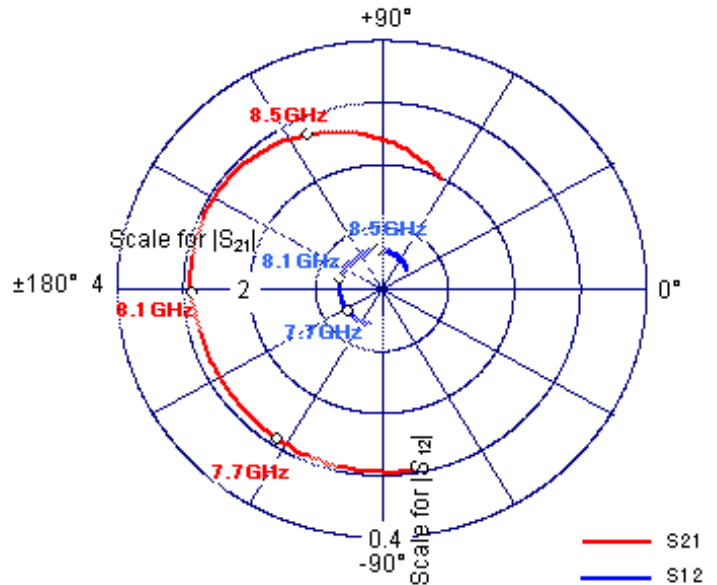
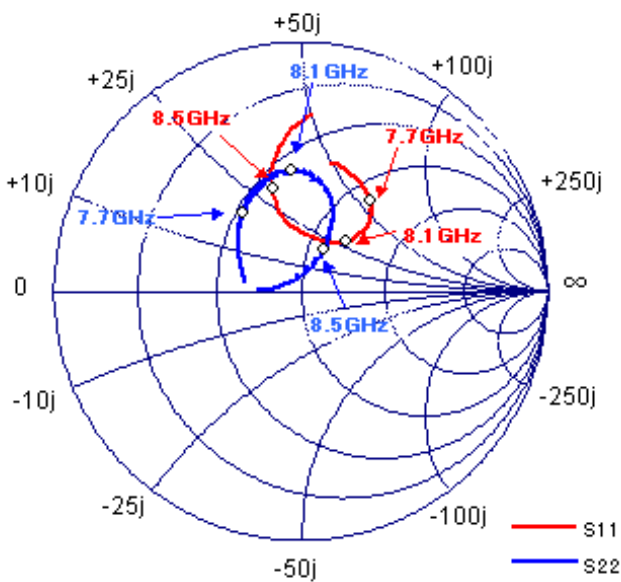
IMD v.s. Output Power by Temperature  
 $V_{DS}(DC)=10V, I_{DS}(DC)=2.6A @ 8.1GHz$



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

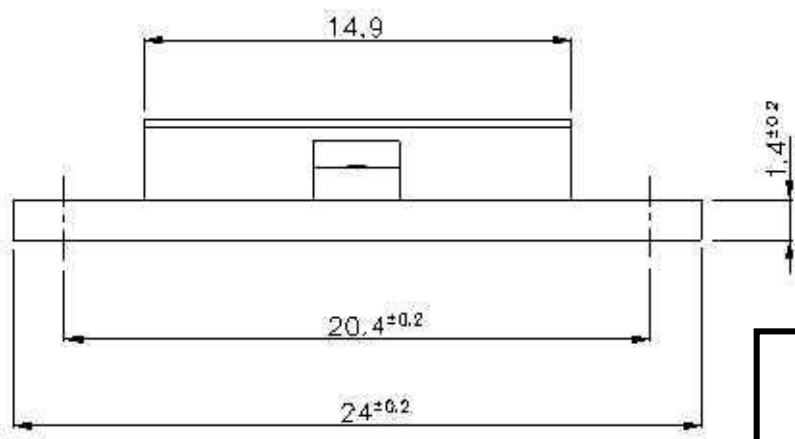
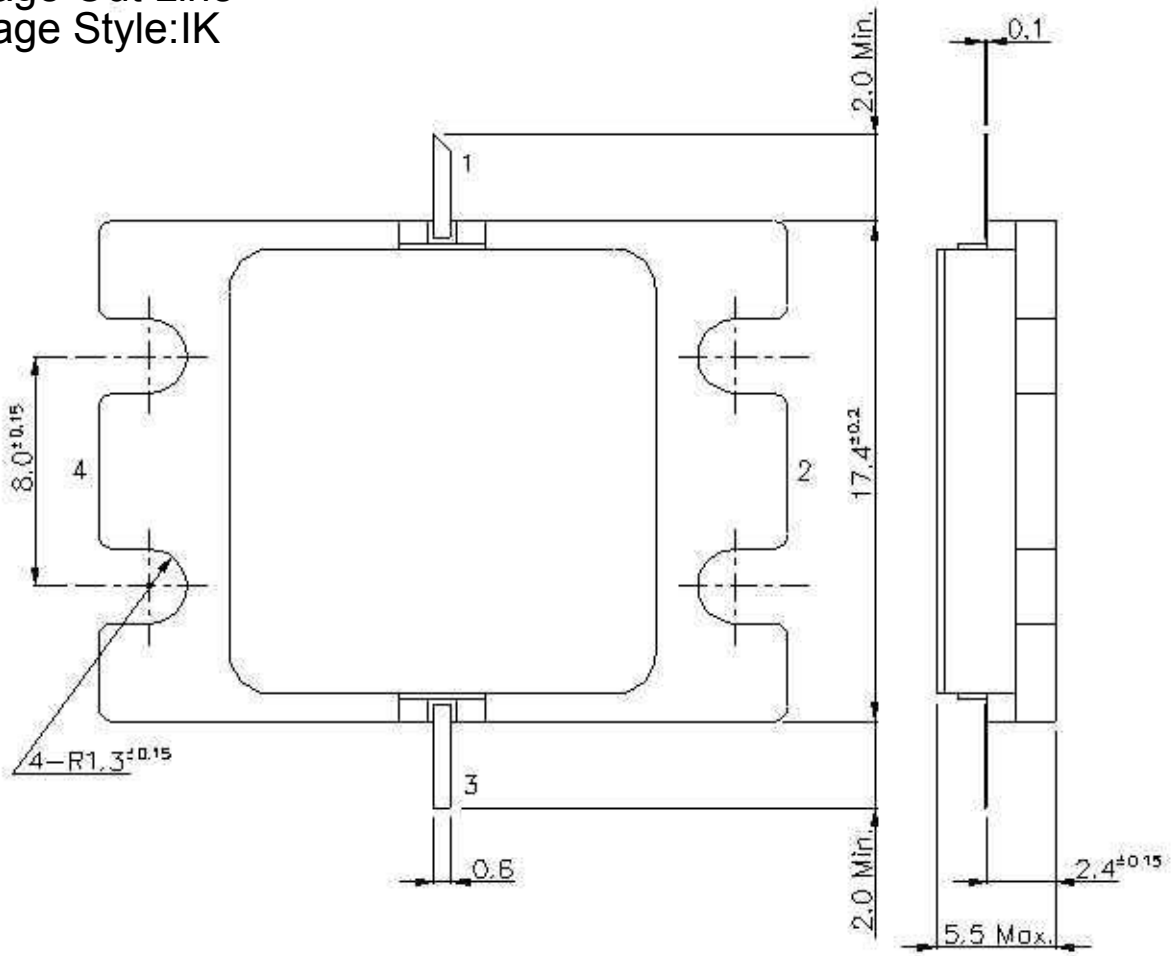


### S-parameter



FREQ. (GHz)	S11		S21		S12		S22	
	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)

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- 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.

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