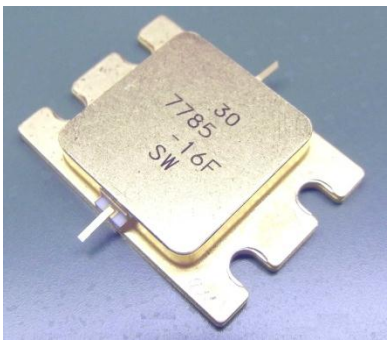
ELM7785-16F

C-band Internally Matched FET

FEATURES

High Output Power : P1dB=42.5dBm(typ.)
High Gain : G1dB=8.0dB(typ.)
High P.A.E. : ηadd=37%(typ.)
Broad Band : 7.7 to 8.5GHz
Impedance Matched Zin/Zout = 50ohm
Hermetically Sealed Package



DESCRIPTION

The ELM7785-16F is a power GaAs FET that is internally matched for standard communication bands to provide optimum power and gain in a 50ohm 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	46.9	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=51ohm	< +43.0	mA
Reverse Gate Current	I_{GR}	R_G=51ohm	> -11.0	mA
Storage Temperature	T_{STG}		-55 to +125	deg.C
Channel Temperature	T_{CH}		+ 155	deg.C

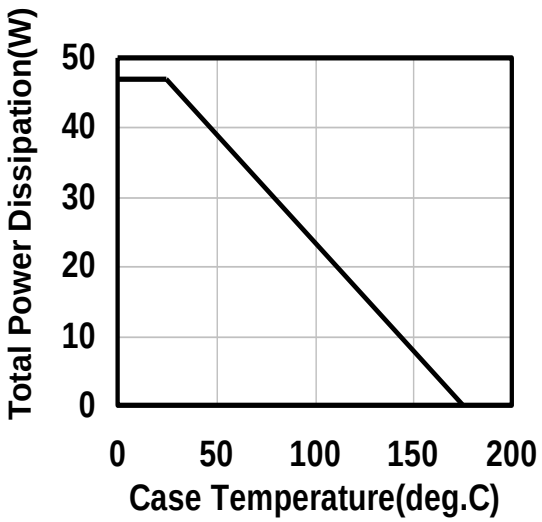
ELECTRICAL CHARACTEEISTICS (Case Temperature Tc=25 deg.C)

Item	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Drain Current	I_{DSS}	V_{DS}=5V, V_{GS}=0V	-	7600	10500	mA
Transconductance	gm	V_{DS}=5V, I_{DS}=4200mA	-	5000	-	mS
Pinch-off Voltage	V_P	V_{DS}=5V, I_{DS}=300mA	-0.5	-1.5	-3.0	V
Gate-Source Breakdown Voltage	V_{GSO}	I_{GS}=-300uA	-5	-	-	V
Frequency Range	f	VDS=10V	7.7	-	8.5	GHz
Output Power at 1dB G.C.P.	P_{1dB}	IDS(DC)=2800mA(typ.)	41.5	42.5	-	dBm
Power Gain at 1dB G.C.P.	G_{1dB}	Zs=Zl=50ohm	7.0	8.0	-	dB
Drain Current at 1dB G.C.P.	Idsr		-	4000	4600	mA
Power Added Efficiency	η_{add}		-	37	-	%
Gain Flatness	ΔG		-	-	1.2	dB
3rd Order Inter Modulation Distortion	IM_3	f=8.5GHz, Δf=10MHz, 2-Tone Test Pout=31.5dBm (S.C.L.)	-40	-43	-	dBc
Thermal Resistance	Rth	Channel to Case	-	2.7	3.2	deg.C/W
Channel Temperature Rise	ΔTch	(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

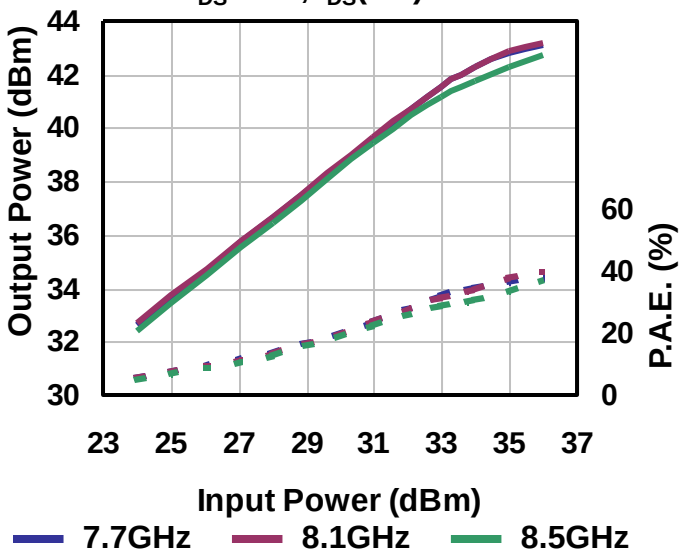
ESD	class 3A	@JEDEC JESD22-A114 (C=100pF, R=1500ohm)
CASE STYLE	IK	
RoHS Compliance	Yes	

Power Derating Curve



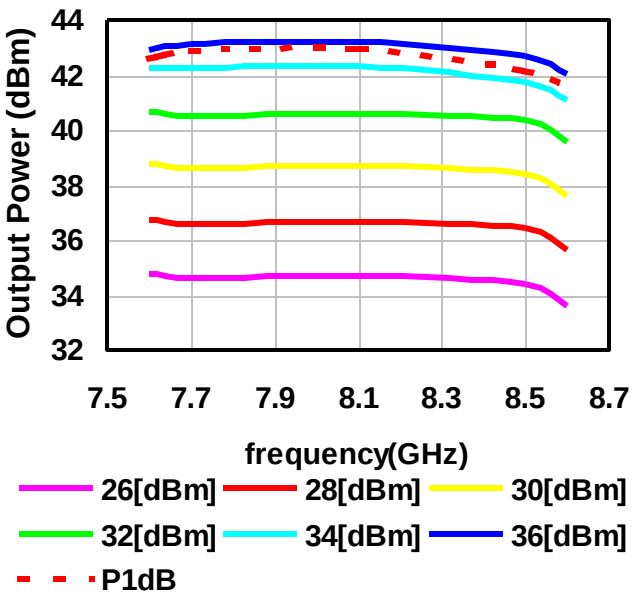
Output Power & P.A.E. v.s. Input Power

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



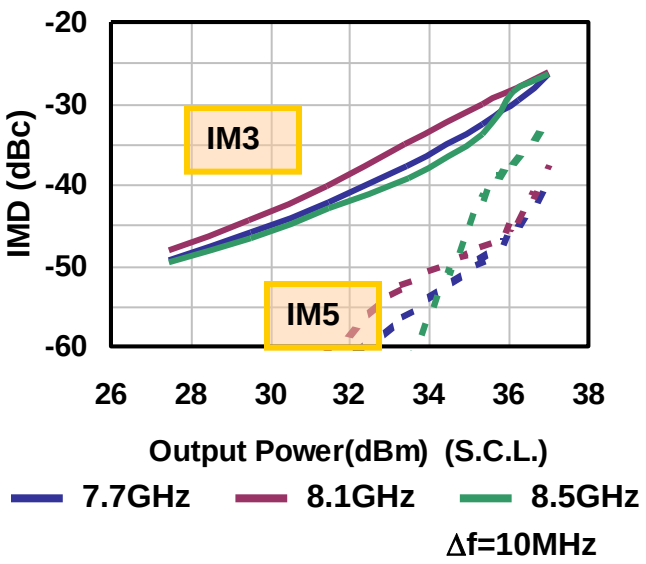
Output Power v.s. Frequency

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



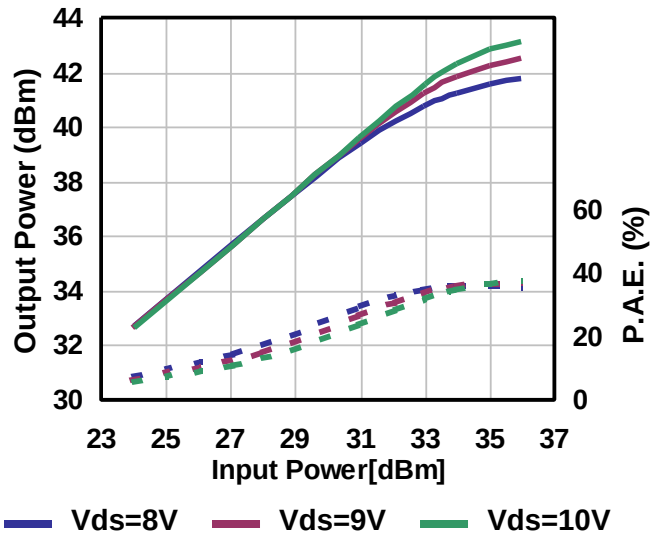
IMD v.s. Output Power

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



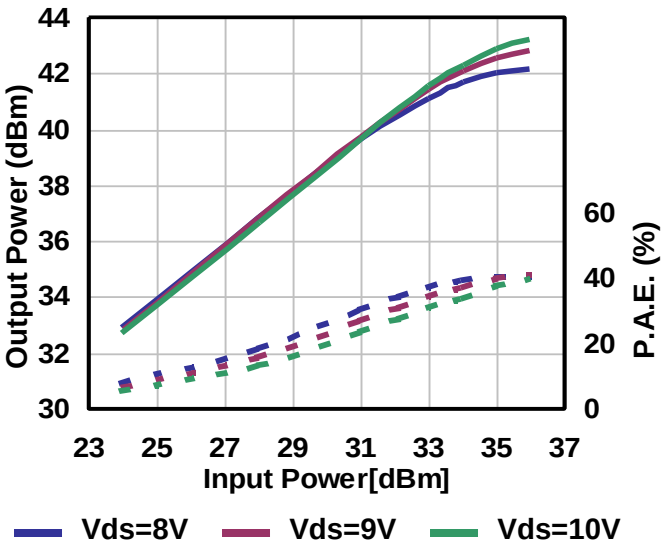
Output Power & P.A.E.
v.s. Input Power by Drain Voltage

I_{DS}(DC)=2.8A@7.7GHz



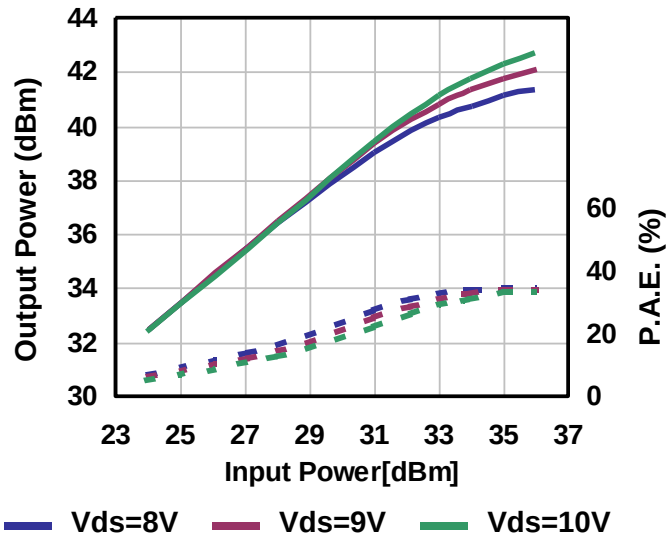
Output Power & P.A.E.
v.s. Input Power by Drain Voltage

I_{DS}(DC)=2.8A@8.1GHz

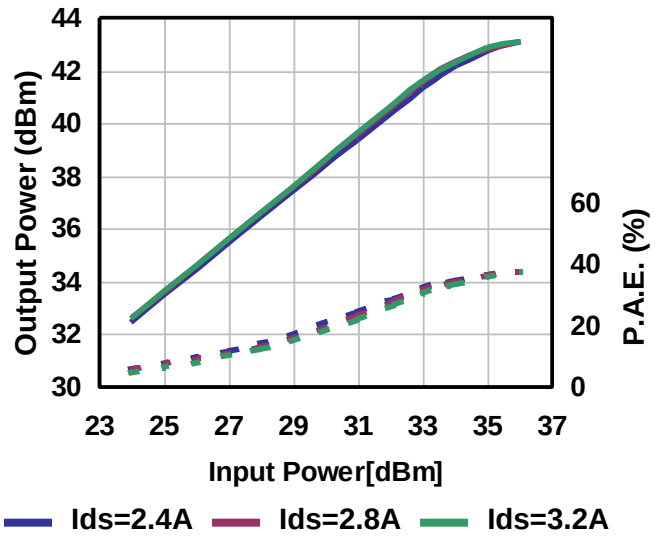


Output Power & P.A.E.
v.s. Input Power by Drain Voltage

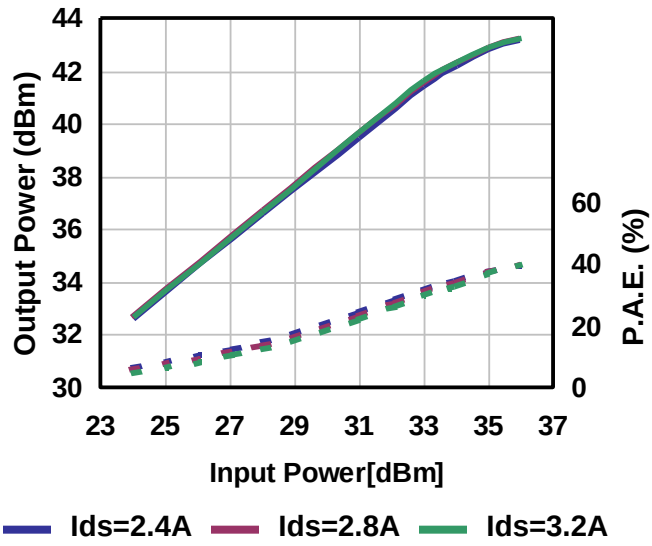
I_{DS}(DC)=2.8A@8.5GHz



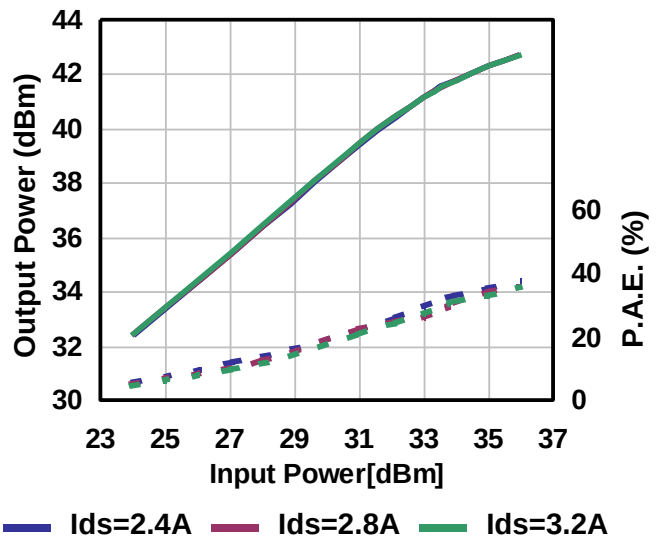
Output Power & P.A.E. v.s. Input Power by Quiescent Drain Current
V_{DS}(DC)=10V@7.7GHz



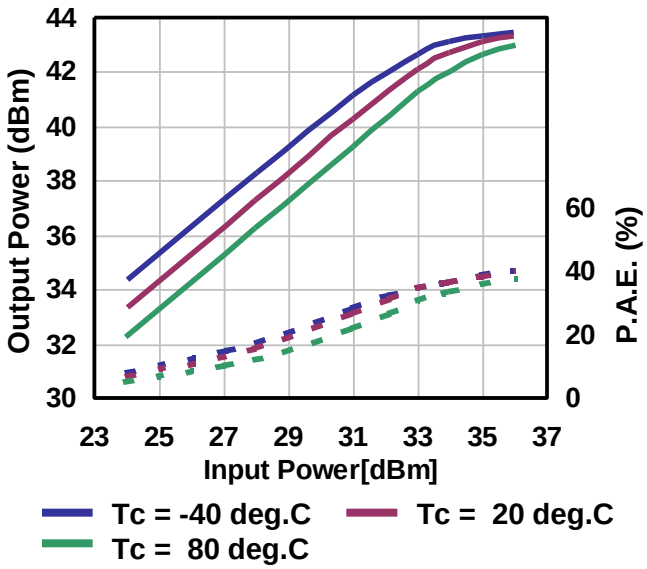
Output Power & P.A.E. v.s. Input Power by Quiescent Drain Current
V_{DS}(DC)=10V@8.1GHz



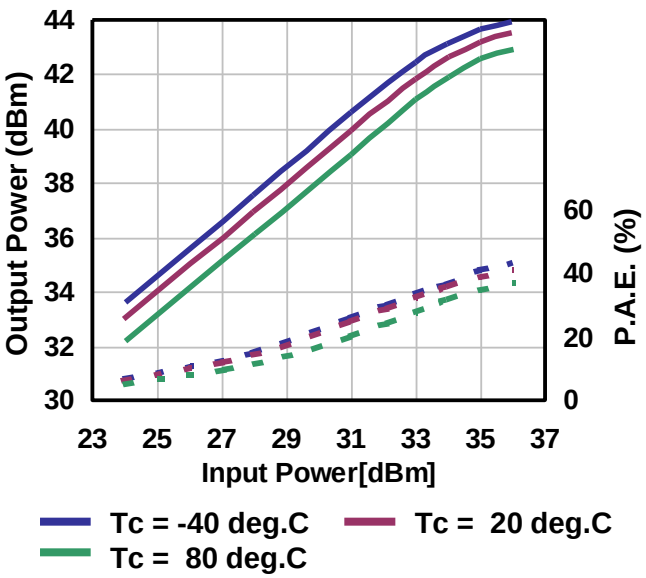
Output Power & P.A.E. v.s. Input Power by Quiescent Drain Current
V_{DS}(DC)=10V@8.5GHz



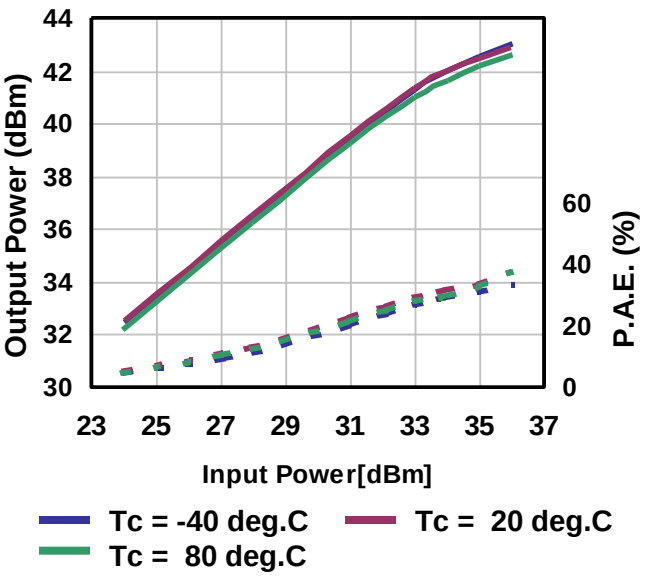
Output Power & P.A.E. v.s. Input Power by Temperature
V_{DS}(DC)=10V, IDS(DC)=2.8A@7.7GHz



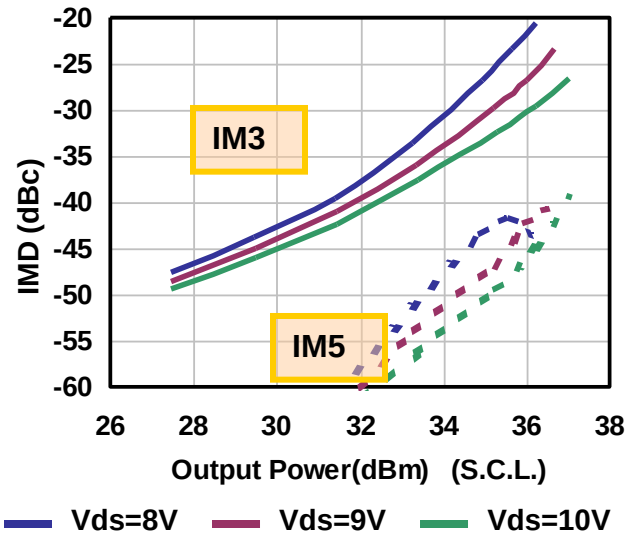
Output Power & P.A.E. v.s. Input Power by Temperature
V_{DS}(DC)=10V, IDS(DC)=2.8A@8.1GHz



Output Power & P.A.E. v.s. Input Power by Temperature
V_{DS}(DC)=10V, IDS(DC)=2.8A@8.5GHz



IMD v.s. Output Power by Drain Voltage
I_{DS}(DC)=2.8A@7.7GHz



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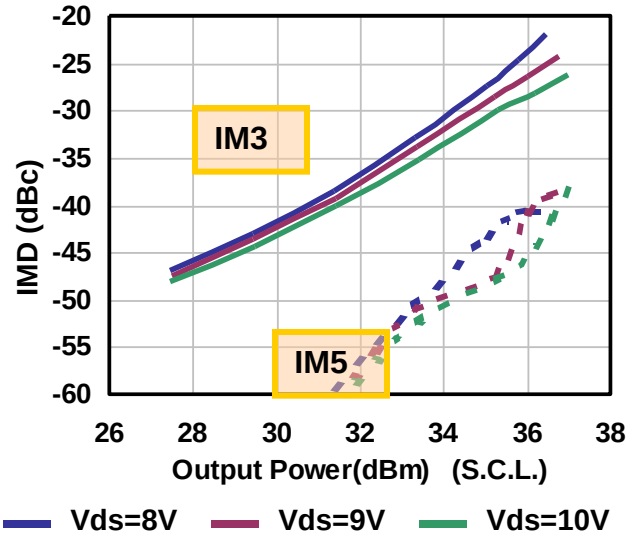

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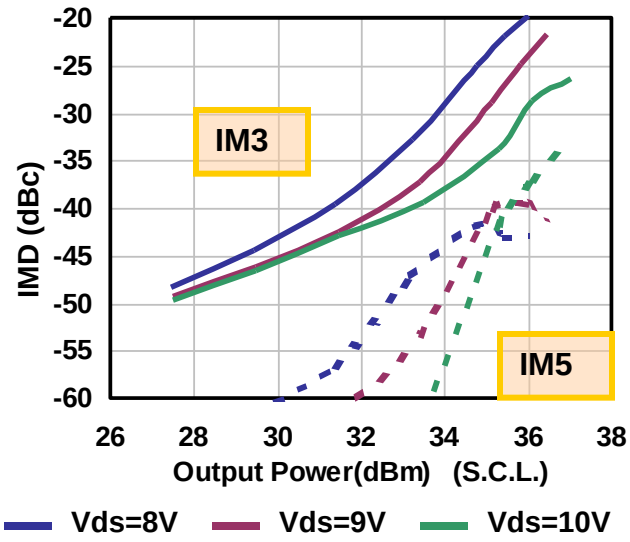
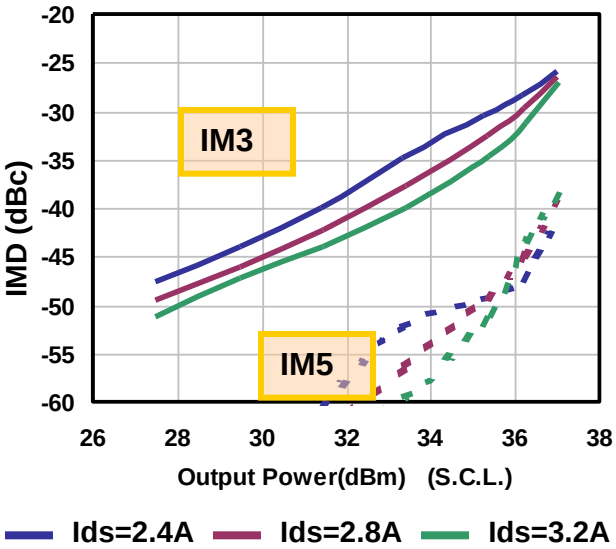
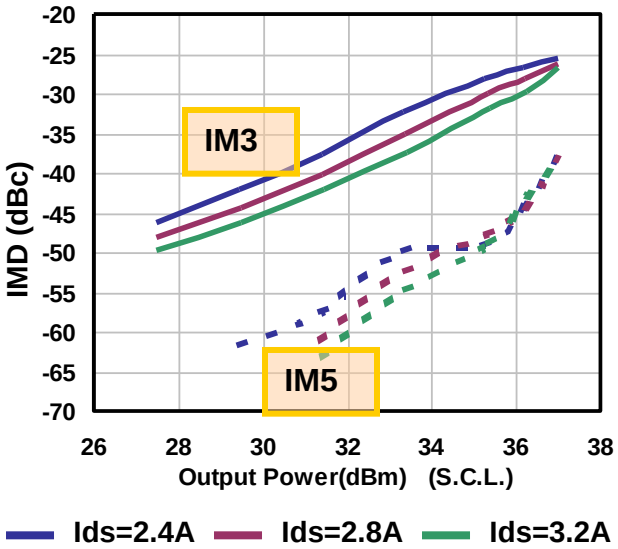


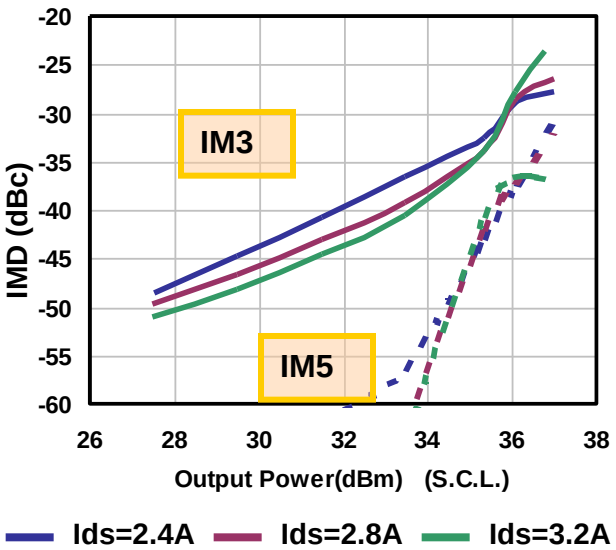
IMD v.s. Output Power
by Quiescent Drain Current
V_{DS}(DC)=10V@7.7GHz



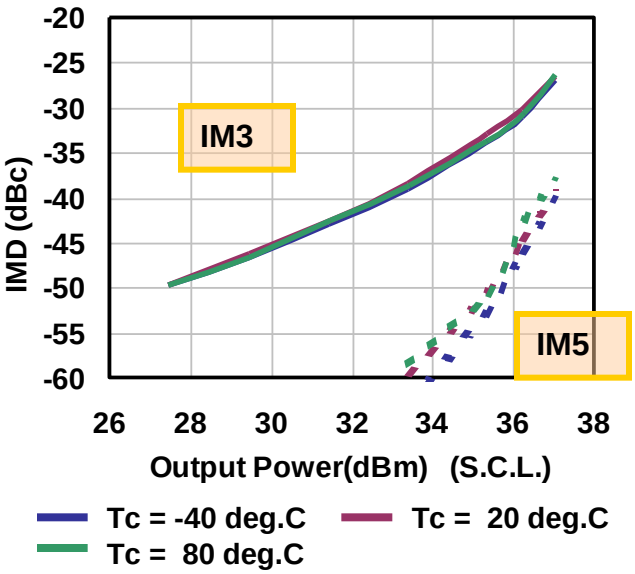
IMD v.s. Output Power
by Quiescent Drain Current
V_{DS}(DC)=10V@8.1GHz



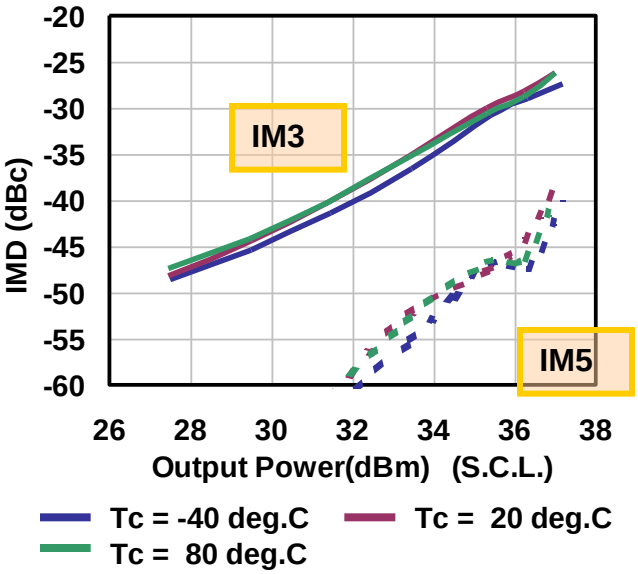
IMD v.s. Output Power
by Quiescent Drain Current
V_{DS}(DC)=10V@8.5GHz



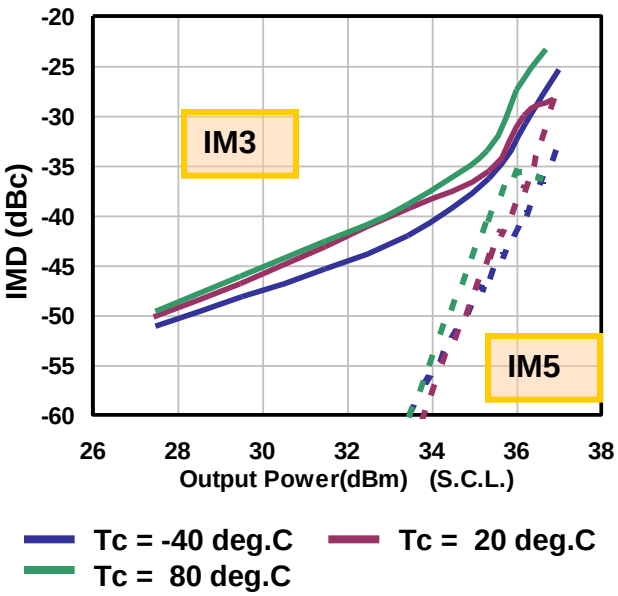
IMD v.s. Output Power by Temperature
V_{DS}(DC)=10V, I_{DS}(DC)=2.8A @ 7.7GHz



IMD v.s. Output Power by Temperature
V_{DS}(DC)=10V, I_{DS}(DC)=2.8A @ 8.1GHz

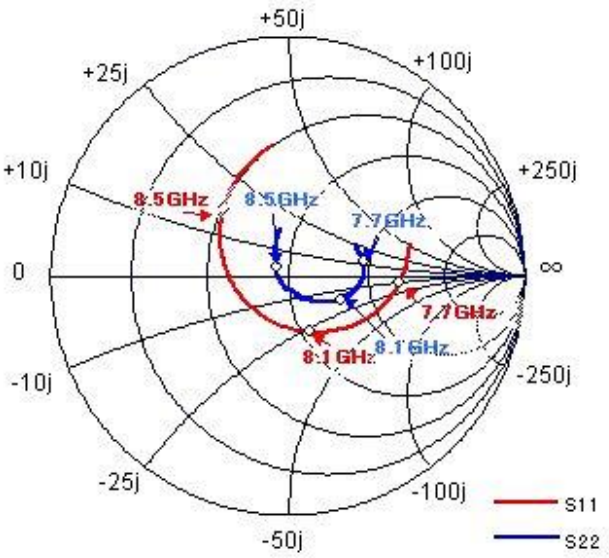


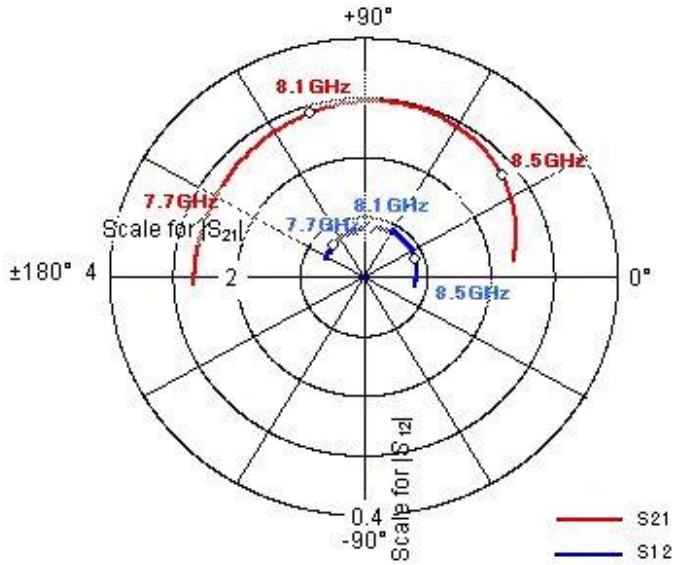
IMD v.s. Output Power by Temperature
V_{DS}(DC)=10V, I_{DS}(DC)=2.8A @ 8.5GHz



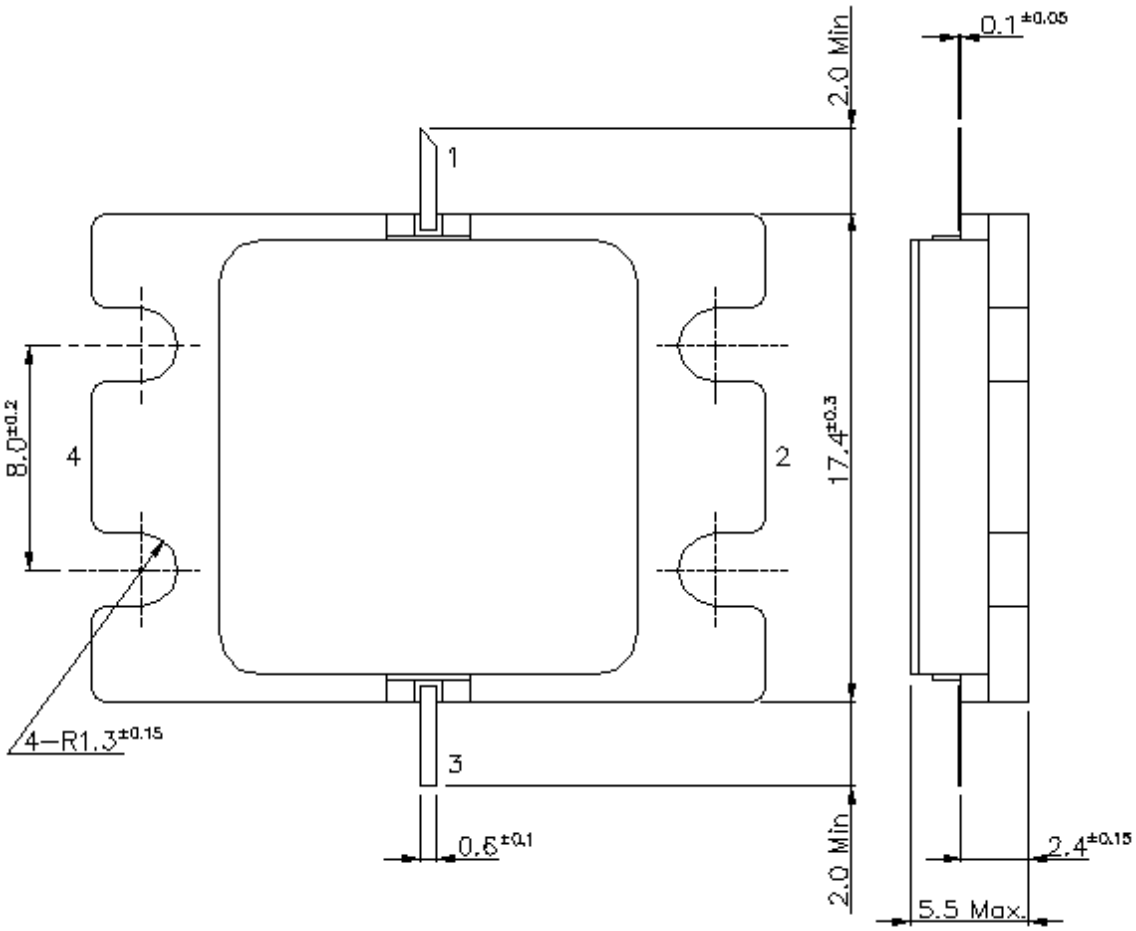
S-parameter

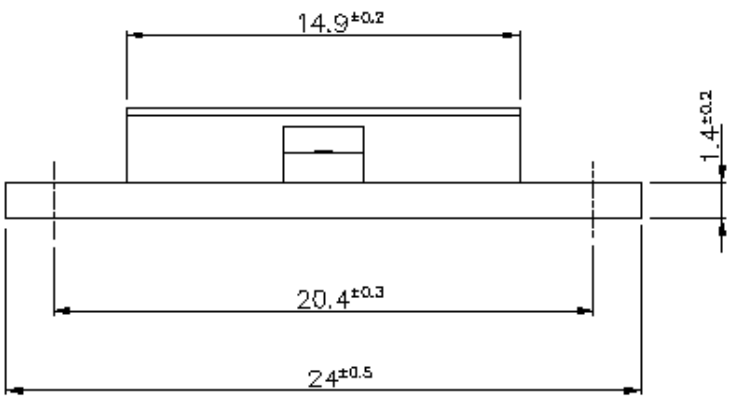
Bias Condition : 10V / 2.8A





FREQUENCY	S11		S21		S12		S22	
(GHz)	MAG	ANG	MAG	ANG	MAG	ANG	MAG	ANG
7.50	0.534	14.5	2.672	-177.4	0.066	152.7	0.308	21.7
7.60	0.510	7.1	2.656	173.0	0.067	143.8	0.319	16.7
7.70	0.475	-3.3	2.665	160.9	0.070	132.5	0.328	10.1
7.80	0.431	-14.7	2.696	148.2	0.072	120.9	0.327	2.9
7.90	0.378	-28.3	2.750	135.0	0.075	109.0	0.314	-4.9
8.00	0.319	-44.4	2.809	121.9	0.078	97.1	0.291	-13.3
8.10	0.252	-68.9	2.877	107.0	0.081	83.5	0.250	-23.8
8.20	0.203	-107.2	2.937	91.1	0.085	68.9	0.193	-36.0
8.30	0.210	-153.8	2.957	74.8	0.087	54.1	0.123	-51.5
8.40	0.285	163.7	2.903	56.7	0.088	37.4	0.047	-100.2
8.50	0.389	133.7	2.767	38.2	0.087	20.1	0.059	143.7
8.60	0.483	112.5	2.572	21.3	0.085	3.8	0.134	111.2
8.70	0.549	96.8	2.370	6.7	0.081	-10.9	0.196	97.9





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

For further information please contact:

http://global-sei.com/Electro-optic/about/office.html

CAUTION

This product contains **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.