

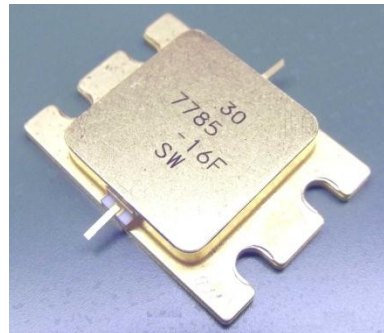
FEATURES

High Output Power : P1dB=42.5dBm(typ.)
 High Gain : G1dB=8.0dB(typ.)
 High P.A.E. : η_{add} =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}	$R_G=51\text{ohm}$	< +43.0	mA
Reverse Gate Current	I_{GR}	$R_G=51\text{ohm}$	> -11.0	mA
Storage Temperature	T_{STG}		-55 to +125	deg.C
Channel Temperature	T_{CH}		+ 155	deg.C

ELECTRICAL CHARACTERISTICS (Case Temperature $T_c=25\text{ deg.C}$)

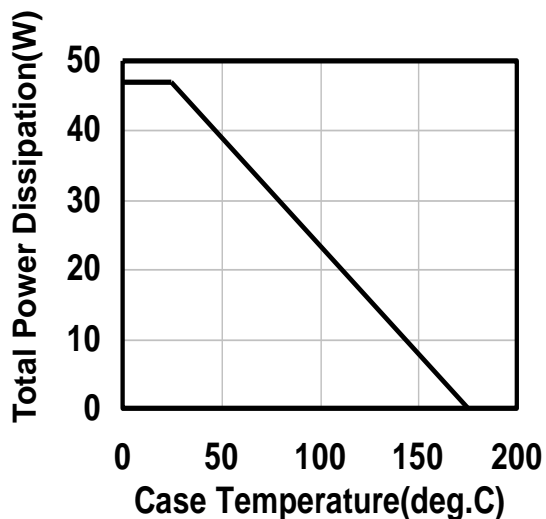
Item	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Drain Current	I_{DSS}	$V_{DS}=5V, V_{GS}=0V$	-	7600	10500	mA
Transconductance	gm	$V_{DS}=5V, I_{DS}=4200\text{mA}$	-	5000	-	mS
Pinch-off Voltage	V_P	$V_{DS}=5V, I_{DS}=300\text{mA}$	-0.5	-1.5	-3.0	V
Gate-Source Breakdown Voltage	V_{GSO}	$I_{GS}=-300\mu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

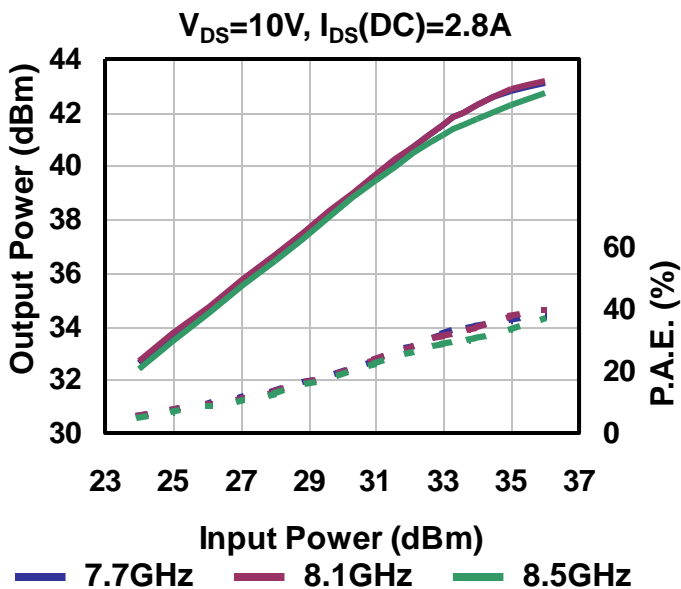
Note : RF-Test is measured with V_{gs} -Constant Circuit

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

Power Derating Curve

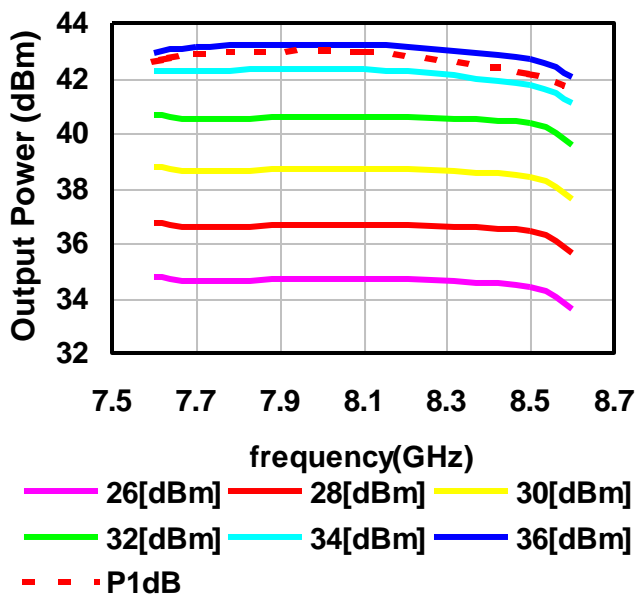


Output Power & P.A.E. v.s. Input Power



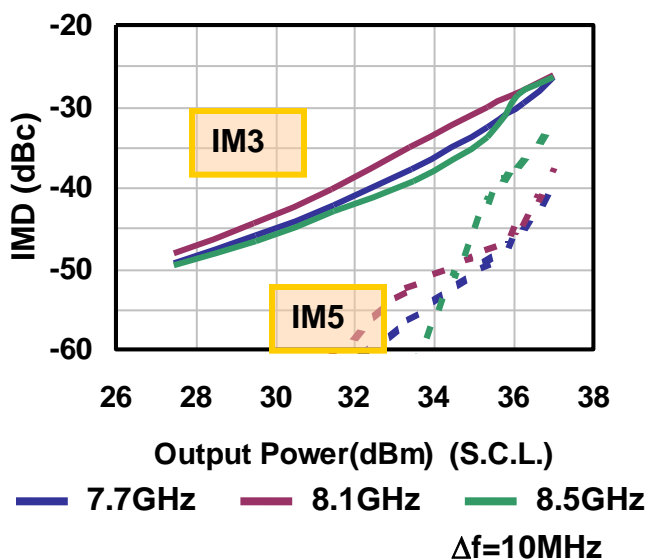
Output Power v.s. Frequency

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



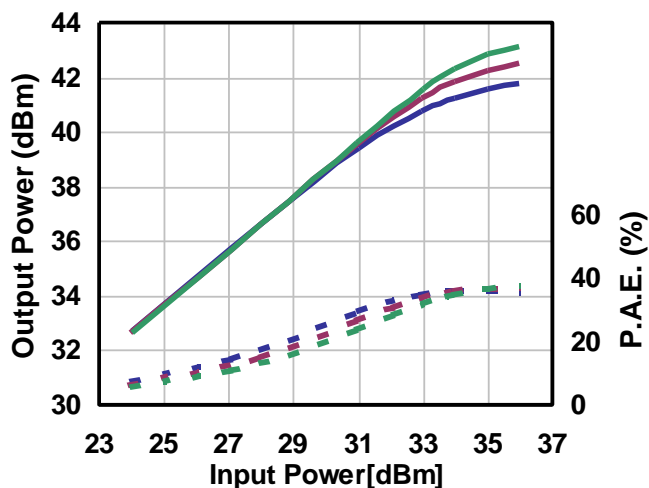
IMD v.s. Output Power

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



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

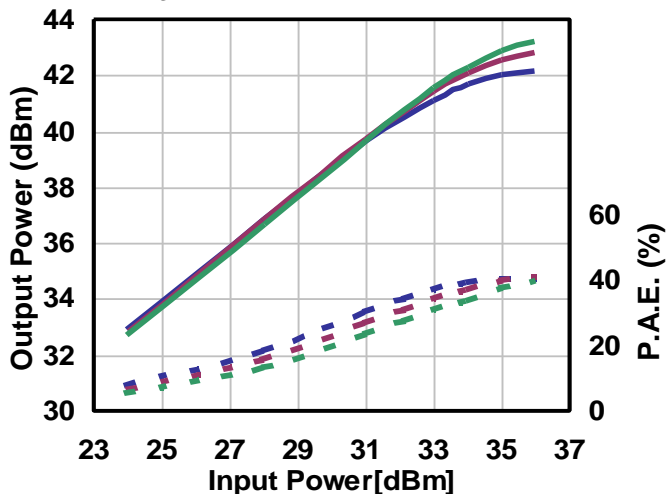
$I_{DS}(DC)=2.8A@7.7GHz$



— Vds=8V — Vds=9V — Vds=10V

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

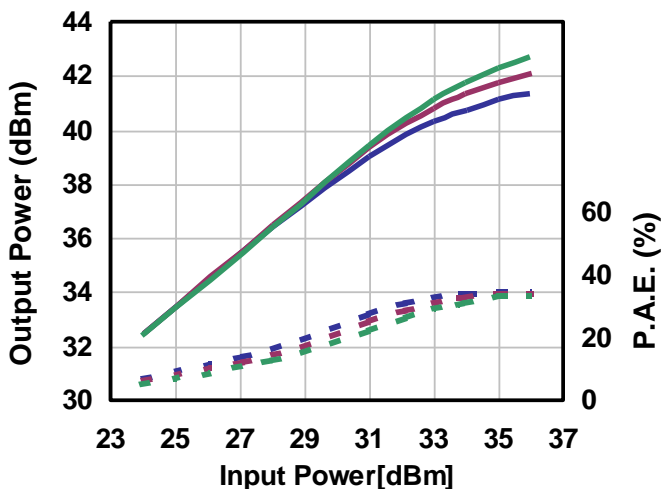
$I_{DS}(DC)=2.8A@8.1GHz$



— Vds=8V — Vds=9V — Vds=10V

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

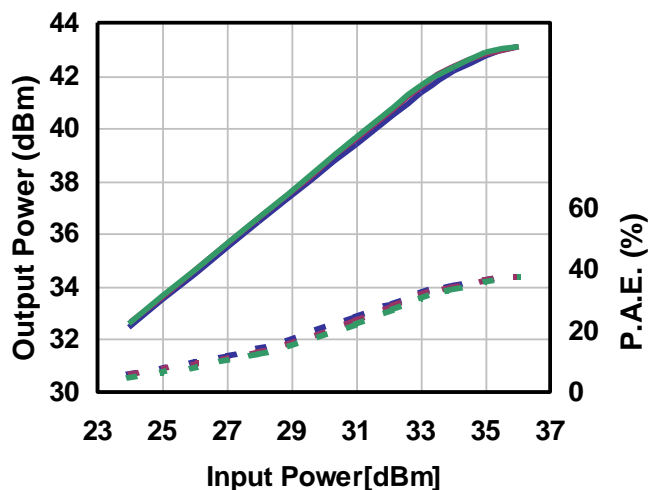
$I_{DS}(DC)=2.8A@8.5GHz$



— Vds=8V — Vds=9V — Vds=10V

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

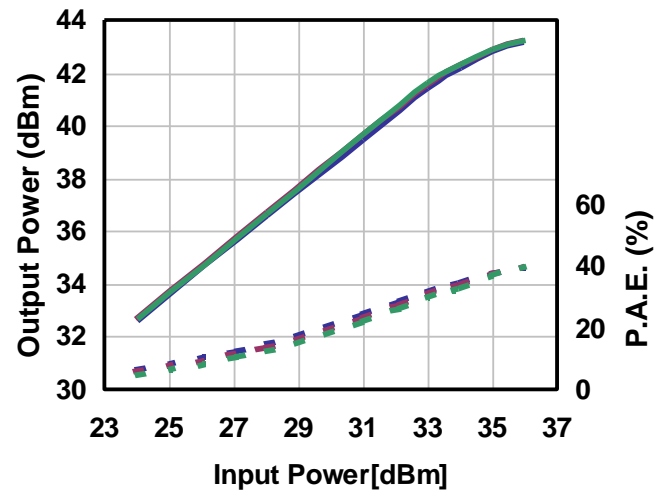
$V_{DS}(DC)=10V@7.7GHz$



— $I_{ds}=2.4A$ — $I_{ds}=2.8A$ — $I_{ds}=3.2A$

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

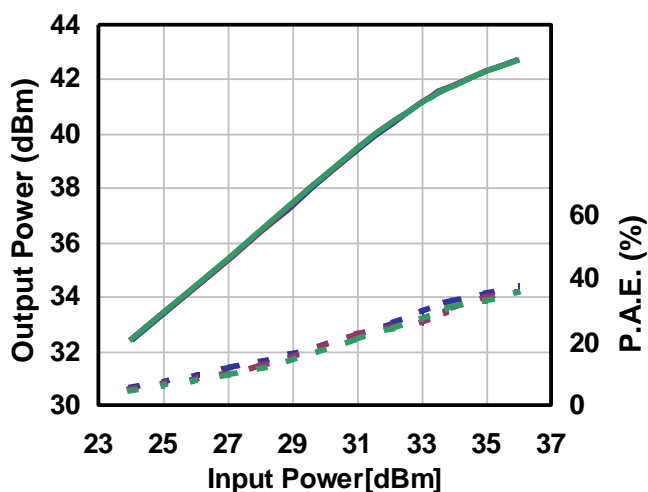
$V_{DS}(DC)=10V@8.1GHz$



— $I_{ds}=2.4A$ — $I_{ds}=2.8A$ — $I_{ds}=3.2A$

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

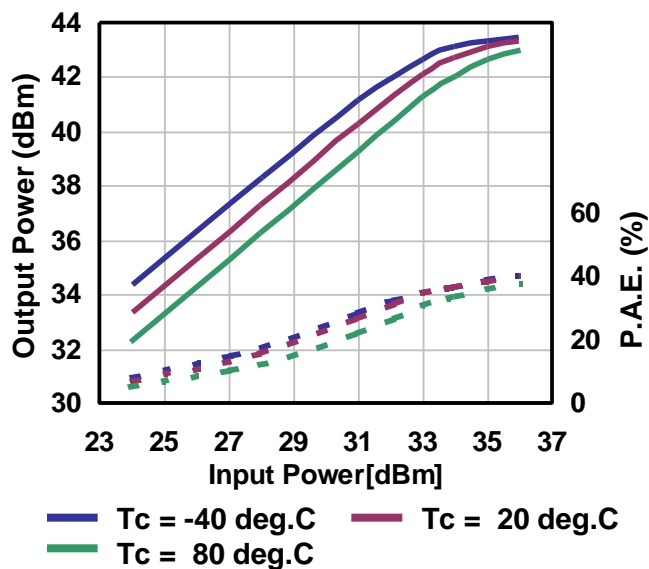
$V_{DS}(DC)=10V@8.5GHz$



— $I_{ds}=2.4A$ — $I_{ds}=2.8A$ — $I_{ds}=3.2A$

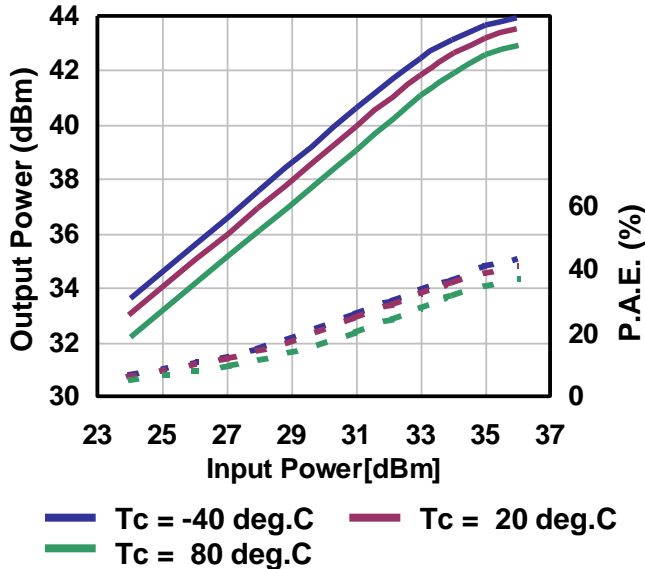
Output Power & P.A.E. v.s. Input Power by Temperature

$V_{DS}(DC)=10V$, $I_{DS}(DC)=2.8A@7.7GHz$



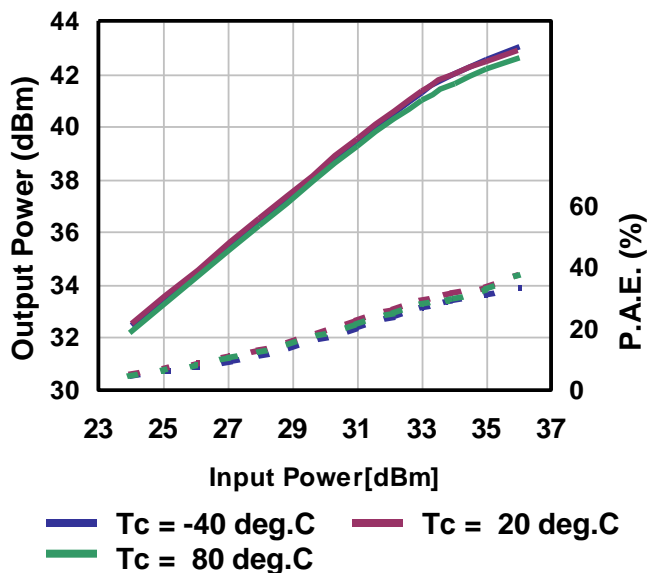
Output Power & P.A.E. v.s. Input Power by Temperature

$V_{DS}(DC)=10V$, $I_{DS}(DC)=2.8A@8.1GHz$

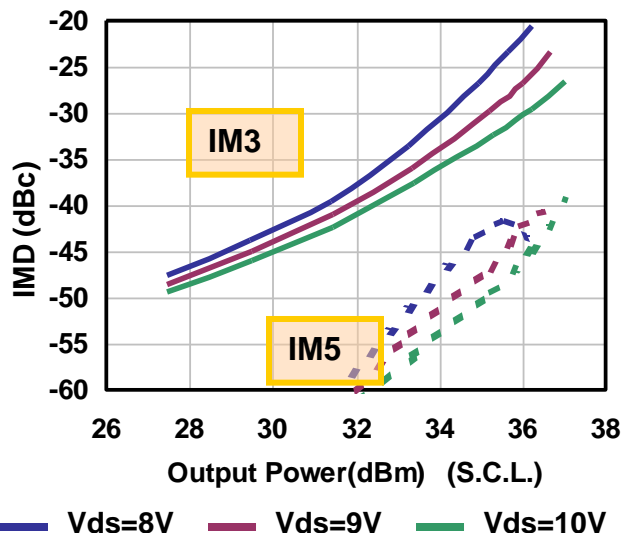


Output Power & P.A.E. v.s. Input Power by Temperature

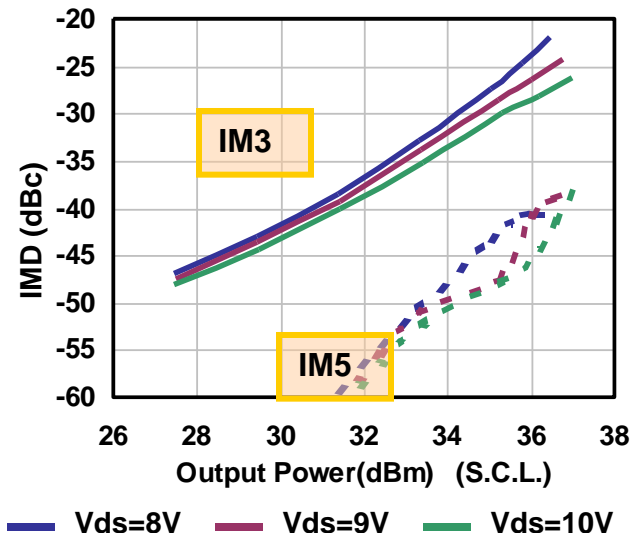
$V_{DS}(DC)=10V$, $I_{DS}(DC)=2.8A@8.5GHz$



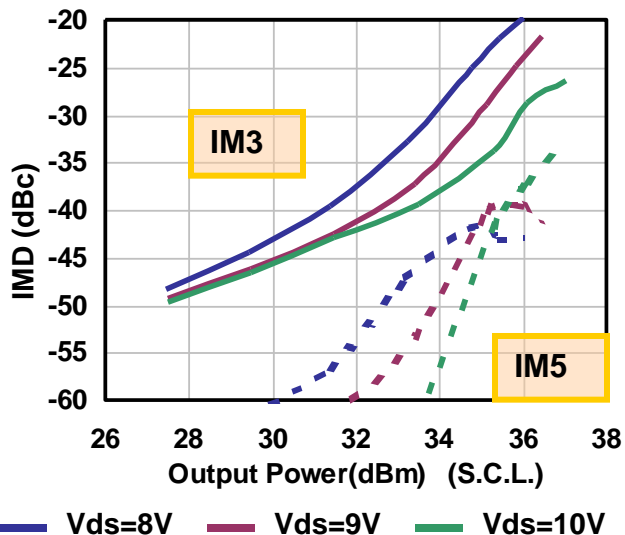
IMD v.s. Output Power by Drain Voltage
 $I_{DS}(DC)=2.8A@7.7GHz$



IMD v.s. Output Power by Drain Voltage
 $I_{DS}(DC)=2.8A@8.1GHz$

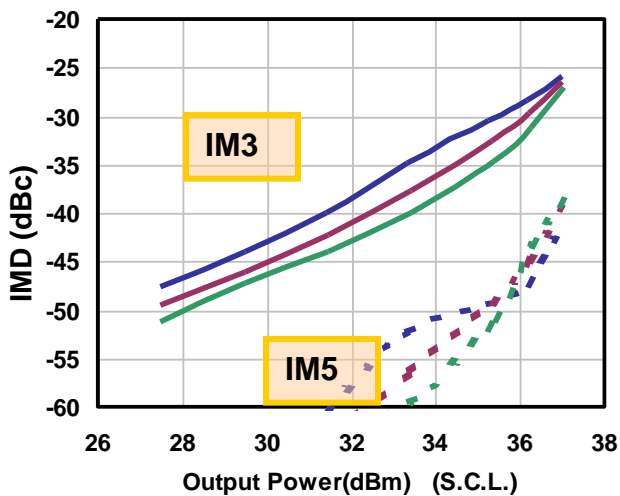


IMD v.s. Output Power by Drain Voltage
 $I_{DS}(DC)=2.8A@8.5GHz$



IMD v.s. Output Power
by Quiescent Drain Current

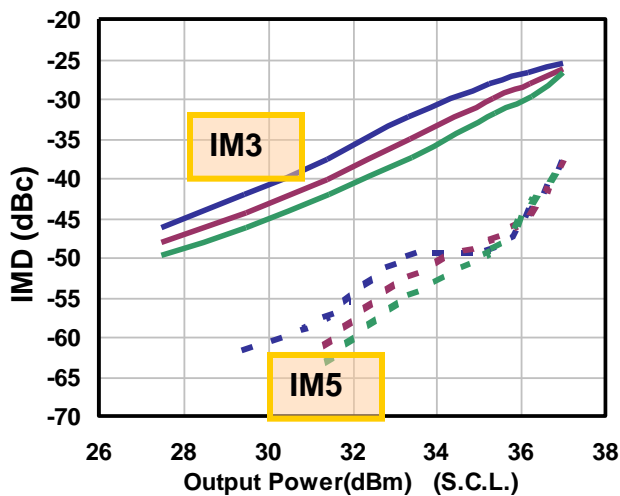
$V_{DS}(DC)=10V@7.7GHz$



— $I_{ds}=2.4A$ — $I_{ds}=2.8A$ — $I_{ds}=3.2A$

IMD v.s. Output Power
by Quiescent Drain Current

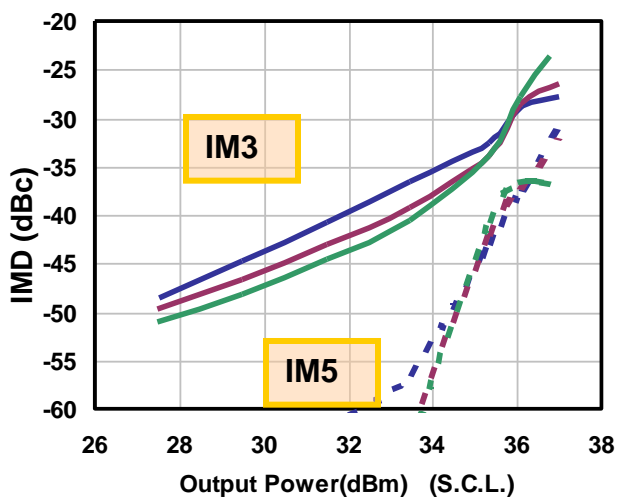
$V_{DS}(DC)=10V@8.1GHz$



— $I_{ds}=2.4A$ — $I_{ds}=2.8A$ — $I_{ds}=3.2A$

IMD v.s. Output Power
by Quiescent Drain Current

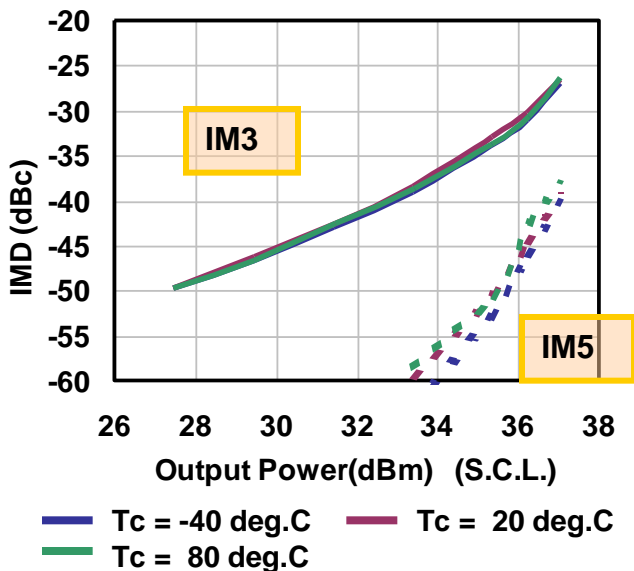
$V_{DS}(DC)=10V@8.5GHz$



— $I_{ds}=2.4A$ — $I_{ds}=2.8A$ — $I_{ds}=3.2A$

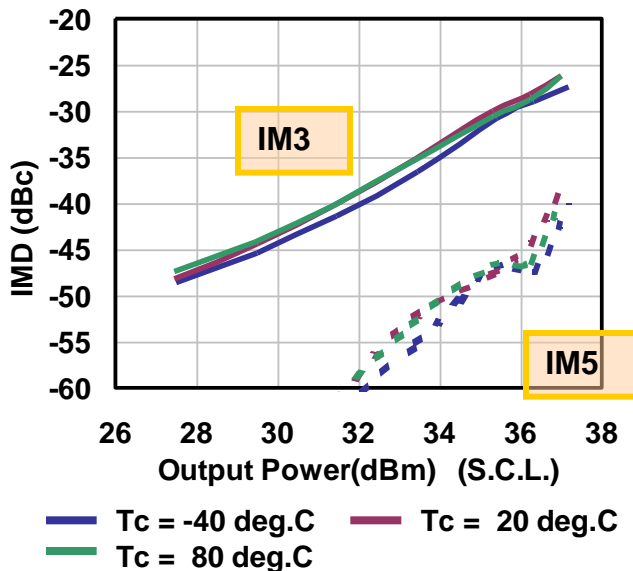
IMD v.s. Output Power by Temperature

$V_{DS}(DC)=10V, I_{DS}(DC)=2.8A @ 7.7GHz$



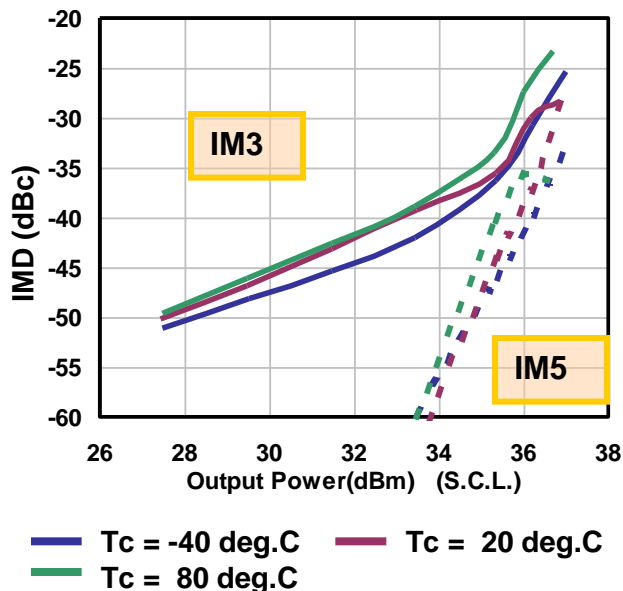
IMD v.s. Output Power by Temperature

$V_{DS}(DC)=10V, I_{DS}(DC)=2.8A @ 8.1GHz$



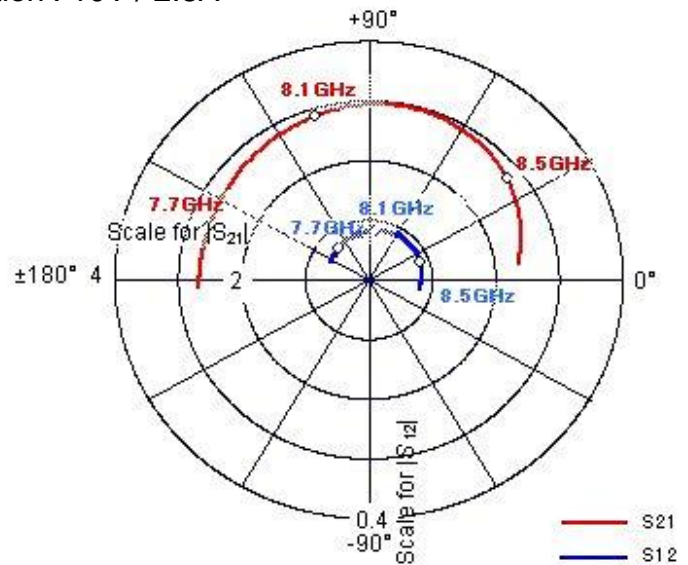
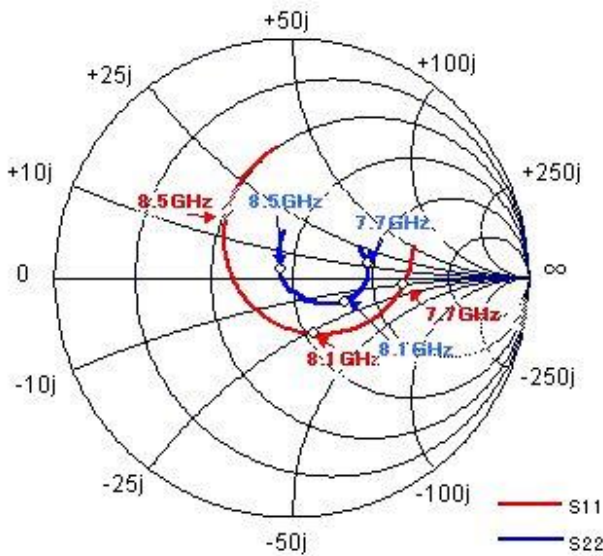
IMD v.s. Output Power by Temperature

$V_{DS}(DC)=10V, I_{DS}(DC)=2.8A @ 8.5GHz$

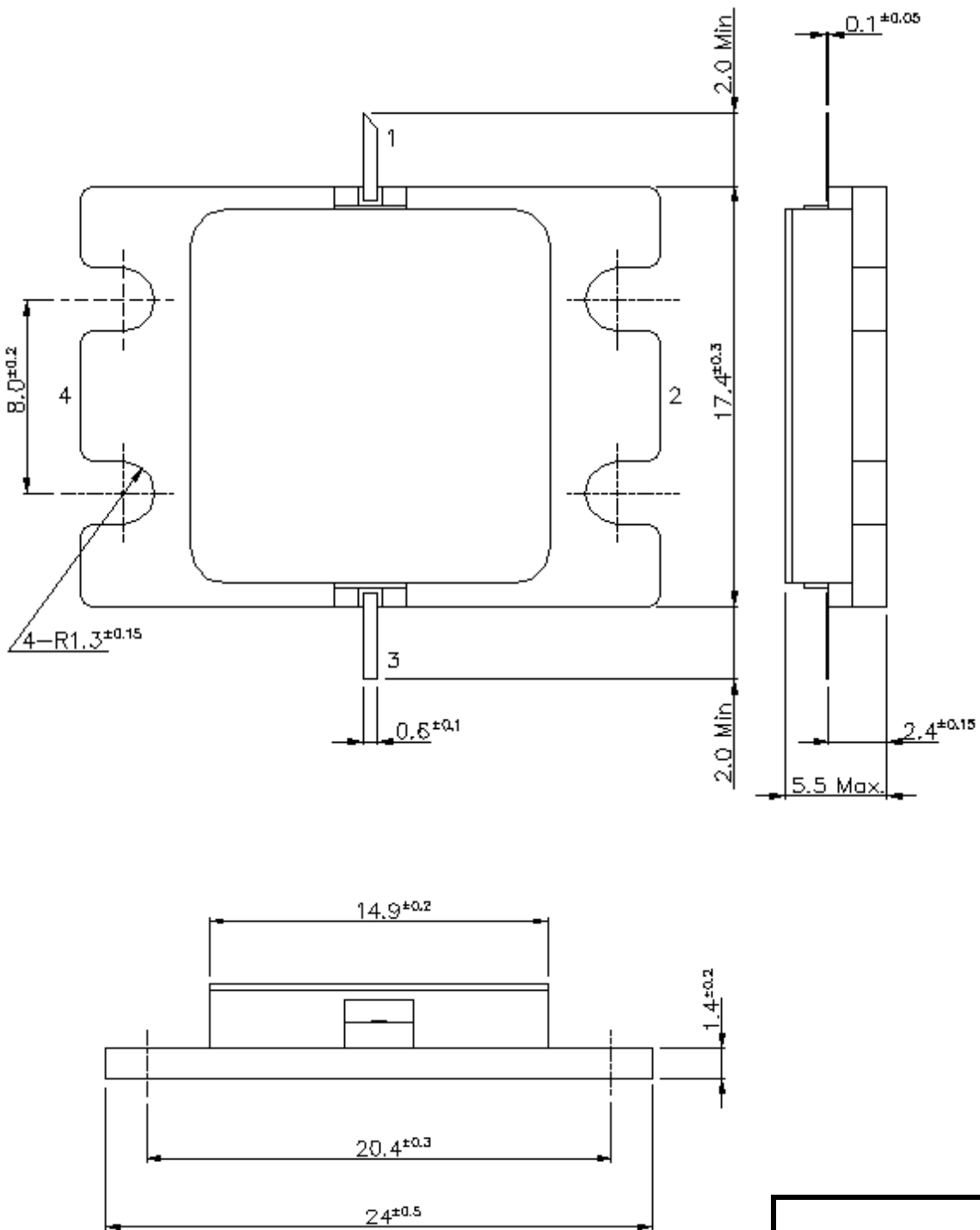


S-parameter

Bias Condition : 10V / 2.8A



FREQUENCY (GHz)	S11		S21		S12		S22	
	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.