

### FEATURES

- High Output Power :  $P_{1dB}=40.5dBm$ (typ.)
- High Gain :  $G_{1dB}=9.0dB$ (typ.)
- High P.A.E.:  $\eta_{add}=38\%$ (typ.)
- Broad Band : 7.1 to 7.9GHz
- Impedance Matched  $Z_{in}/Z_{out} = 50\Omega$
- Hermetically Sealed Package



### DESCRIPTION

The ELM7179-10F 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	$P_T$	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

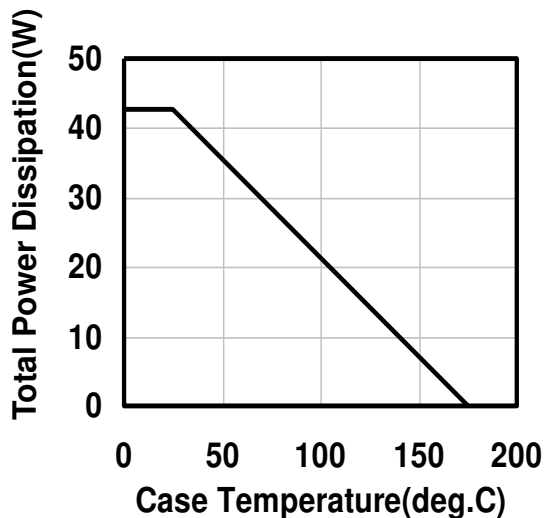
### RECOMMENDED OPERATING CONDITIONS ( Case Temperature $T_c=25$ deg.C )

Item	Symbol	Test Conditions	Limits			Unit
			Min.	Typ.	Max.	
Drain Current	$I_{DSS}$	$V_{DS}=5V, V_{GS}=0V$	-	4000	5600	mA
Transconductance	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	$V_{GSO}$	$I_{GS}=-240\mu A$	-5	-	-	V
Frequency Range	f	$V_{DS}=10V$	7.1	-	7.9	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.	$G_{1dB}$	$Z_s=Z_l=50\Omega$	8.0	9.0	-	dB
Drain Current at 1dB G.C.P.	$I_{dsr}$		-	2600	3000	mA
Power Added Efficiency	$\eta_{add}$		-	38	-	%
Gain Flatness	$\Delta G$		-	-	1.2	dB
3rd Order Inter Modulation Distortion	$IM_3$	f=7.9GHz, $\Delta f=10MHz$ , 2-Tone Test $P_{out}=29.0dBm$ ( S.C.L. )	-44	-46	-	dBc
Thermal Resistance	Rth	Channel to Case	-	3.0	3.5	deg.C/W
Channel Temperature Rise	$\Delta T_{ch}$	$(V_{DS} \times I_{dsr} - P_{OUT} + P_{IN}) \times R_{th}$	-	-	100	deg.C

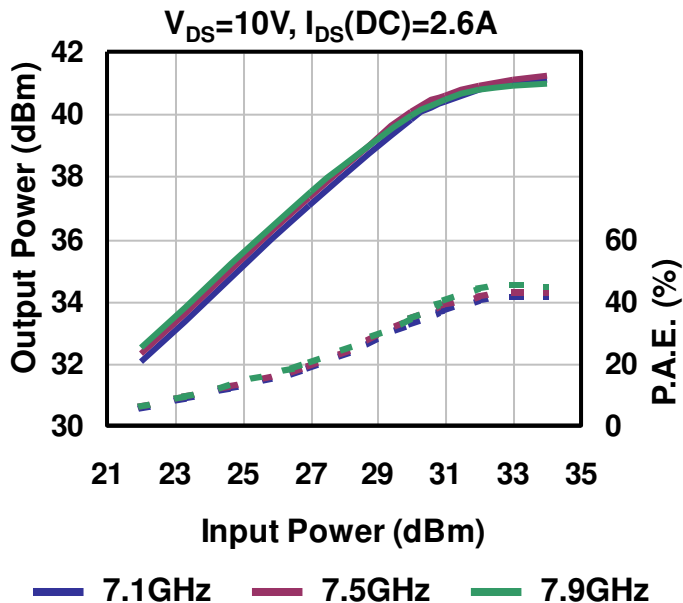
G.C.P. = Gain Compression Point S.C.L. = Single Carrier Level  
Note : RF-Test is measured with  $V_{GS}$ -Constant Circuit

ESD	Class 3A	Based on JEDEC JESD22-A114 (C=100pF, R=1.5kohm)
CASE STYLE	IK	
RoHS Compliance	Yes	

### Power Derating Curve

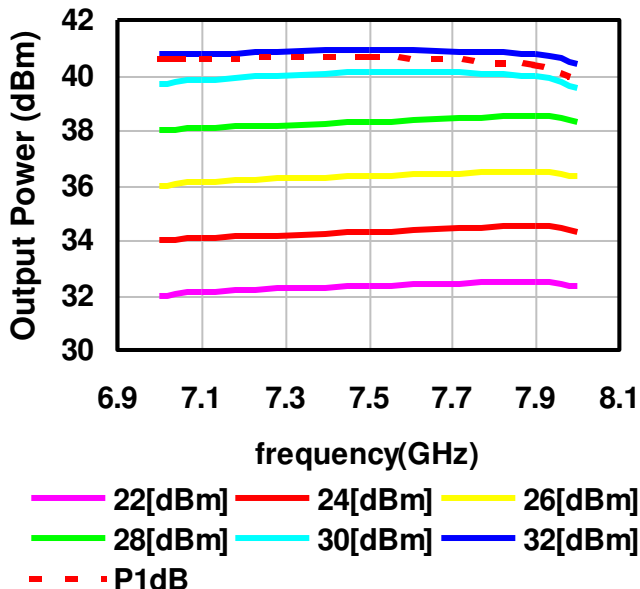


### Output Power & P.A.E. vs. Input Power



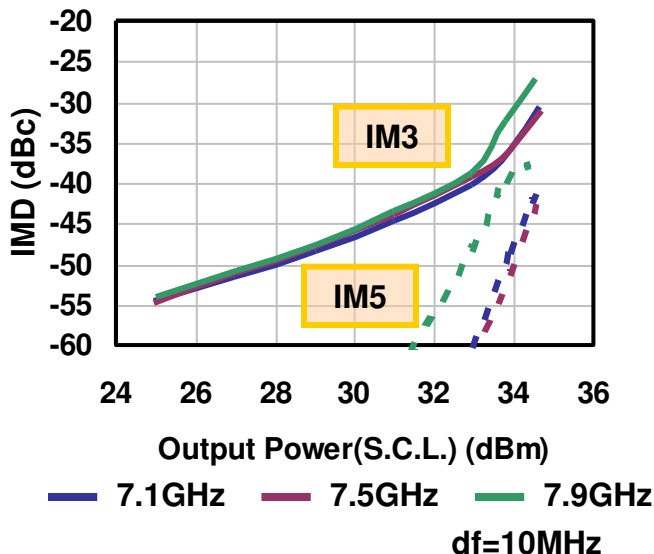
### Output Power vs. Frequency

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



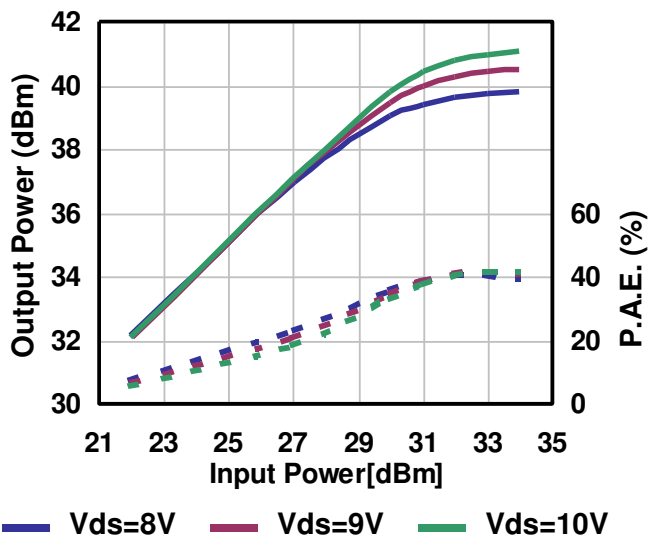
### IMD vs. Output Power

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



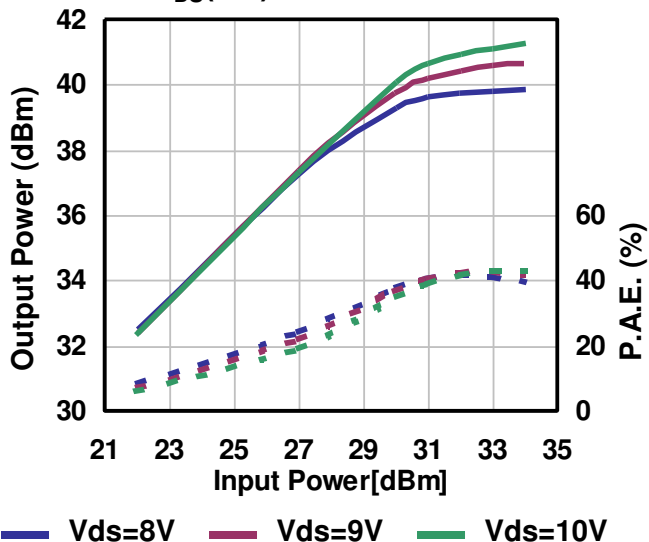
**Output Power & P.A.E.  
vs. Input Power by Drain Voltage**

$I_{DS}(DC)=2.6A@7.1GHz$



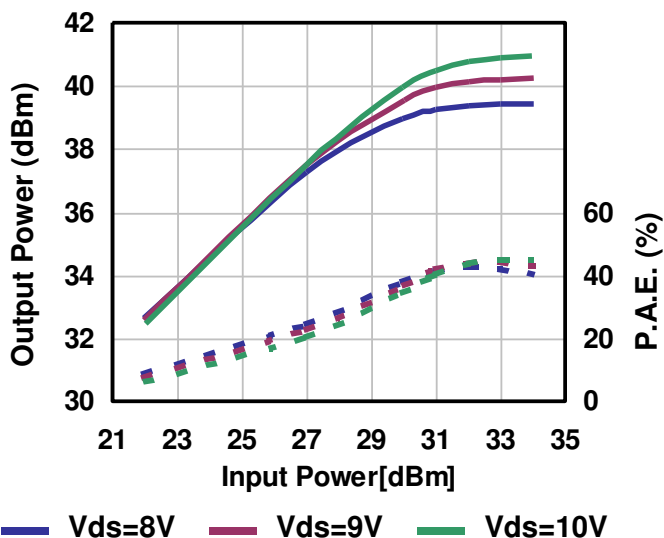
**Output Power & P.A.E.  
vs. Input Power by Drain Voltage**

$I_{DS}(DC)=2.6A@7.5GHz$

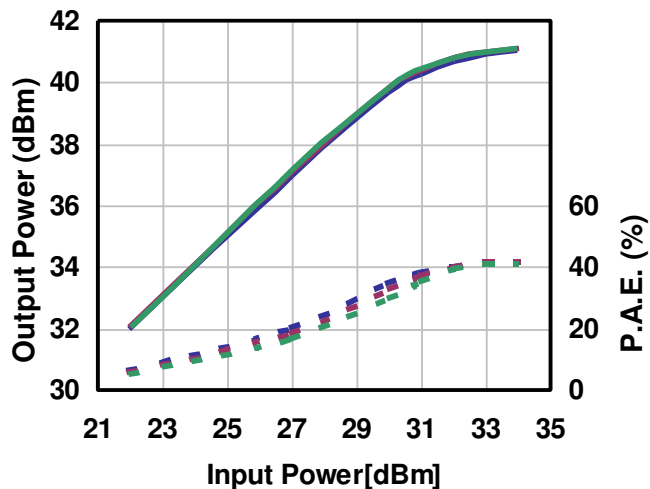


**Output Power & P.A.E.  
vs. Input Power by Drain Voltage**

$I_{DS}(DC)=2.6A@7.9GHz$

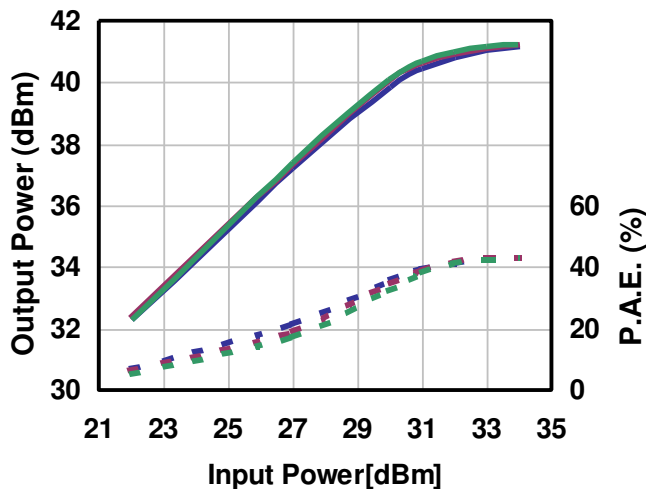


Output Power & P.A.E. vs. Input Power  
by Quiescent Drain Current  
 $V_{DS}(DC)=10V@7.1GHz$



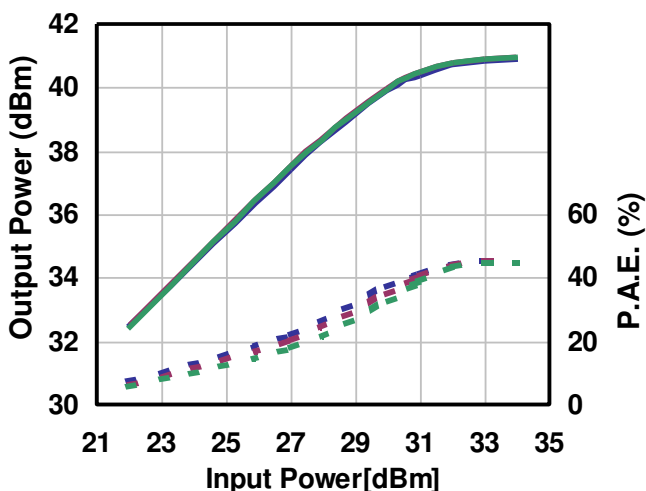
—  $I_{ds}=2.2A$  —  $I_{ds}=2.6A$  —  $I_{ds}=3.0A$

Output Power & P.A.E. vs. Input Power  
by Quiescent Drain Current  
 $V_{DS}(DC)=10V@7.5GHz$



—  $I_{ds}=2.2A$  —  $I_{ds}=2.6A$  —  $I_{ds}=3.0A$

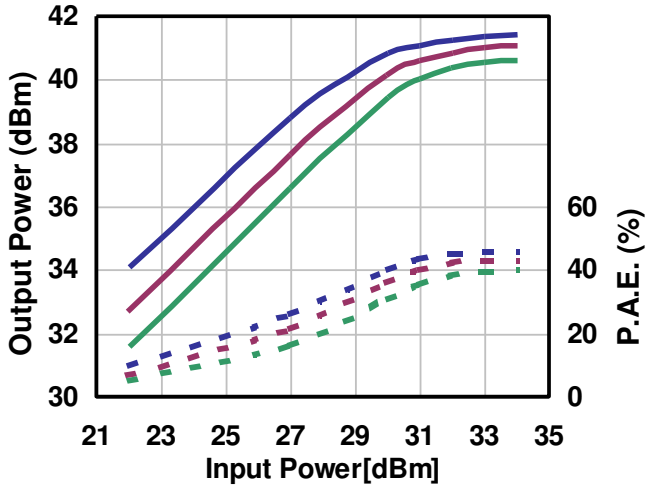
Output Power & P.A.E. vs. Input Power  
by Quiescent Drain Current  
 $V_{DS}(DC)=10V@7.9GHz$



—  $I_{ds}=2.2A$  —  $I_{ds}=2.6A$  —  $I_{ds}=3.0A$

Output Power & P.A.E. vs. Input Power  
by Temperature

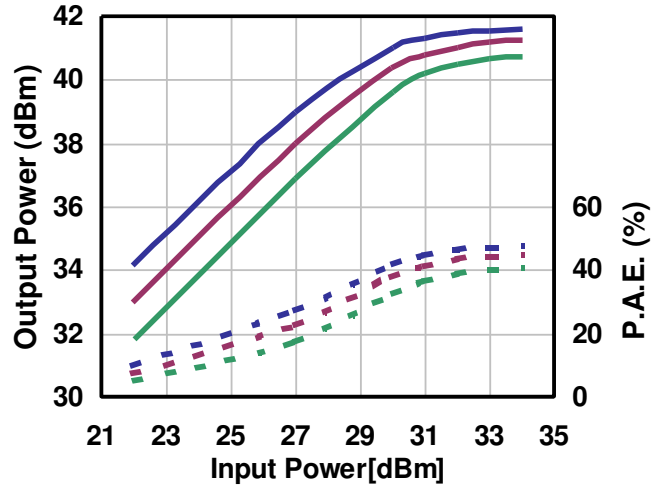
$V_{DS}(DC)=10V, I_{DS}(DC)=2.6A@7.1GHz$



— Tc = -40deg.C    — Tc = 20deg.C  
— Tc = 80deg.C

Output Power & P.A.E. vs. Input Power  
by Temperature

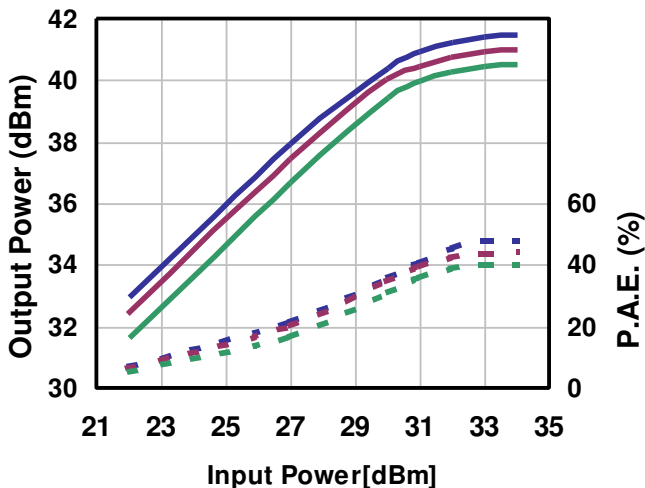
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Output Power & P.A.E. vs. Input Power  
by Temperature

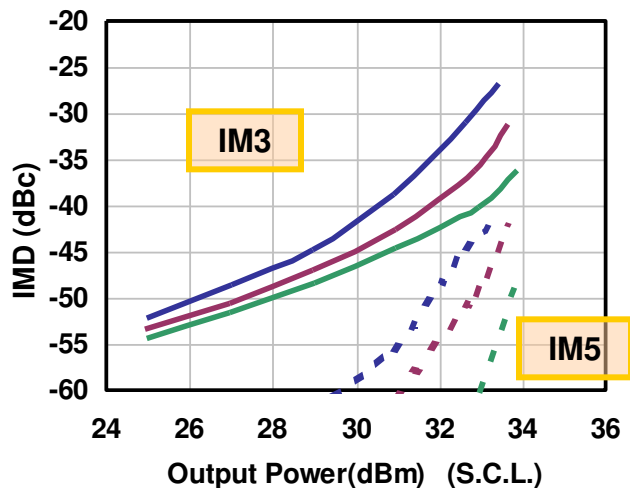
$V_{DS}(DC)=10V, I_{DS}(DC)=2.6A@7.9GHz$



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IMD vs. Output Power by Drain Voltage

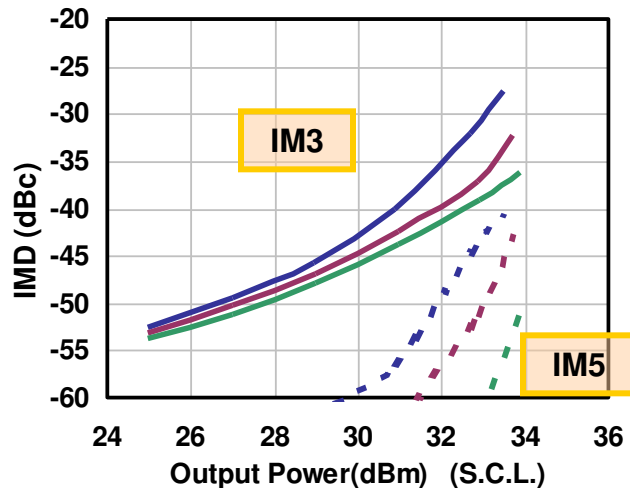
$I_{DS}(DC)=2.6A@7.1GHz$



— Vds=8V — Vds=9V — Vds=10V

IMD vs. Output Power by Drain Voltage

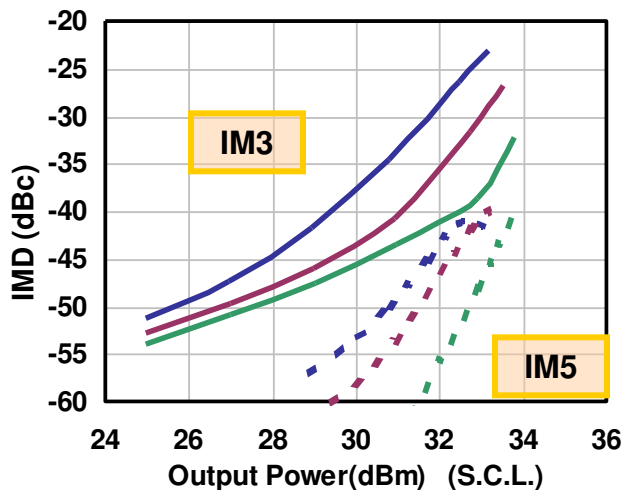
$I_{DS}(DC)=2.6A@7.5GHz$



— Vds=8V — Vds=9V — Vds=10V

IMD vs. Output Power by Drain Voltage

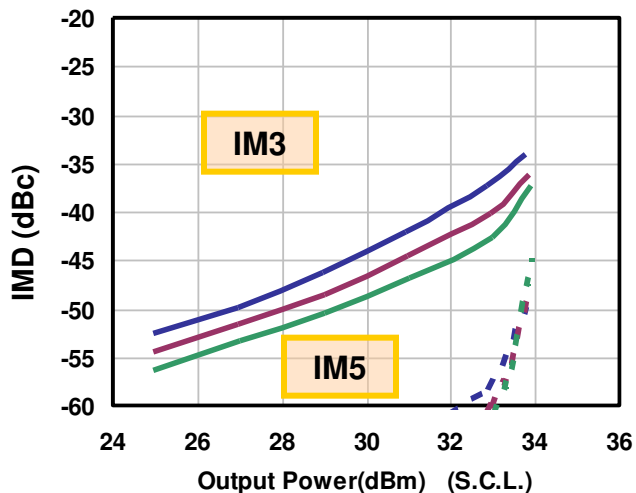
$I_{DS}(DC)=2.6A@7.9GHz$



— Vds=8V — Vds=9V — Vds=10V

**IMD vs. Output Power  
by Quiescent Drain Current**

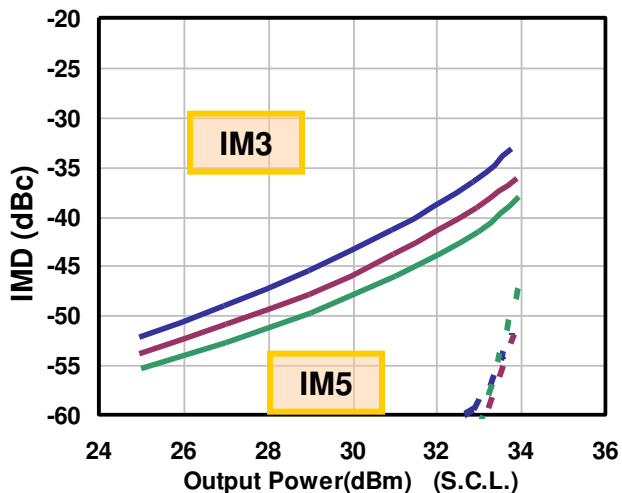
$V_{DS}(DC)=10V@7.1GHz$



—  $I_{ds}=2.2A$  —  $I_{ds}=2.6A$  —  $I_{ds}=3.0A$

**IMD vs. Output Power  
by Quiescent Drain Current**

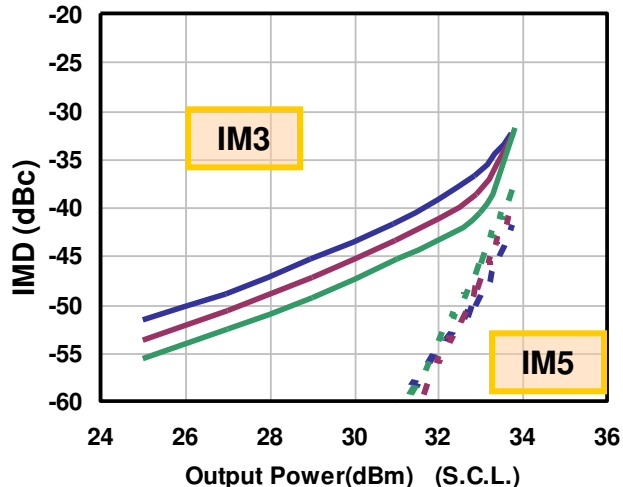
$V_{DS}(DC)=10V@7.5GHz$



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**IMD vs. Output Power  
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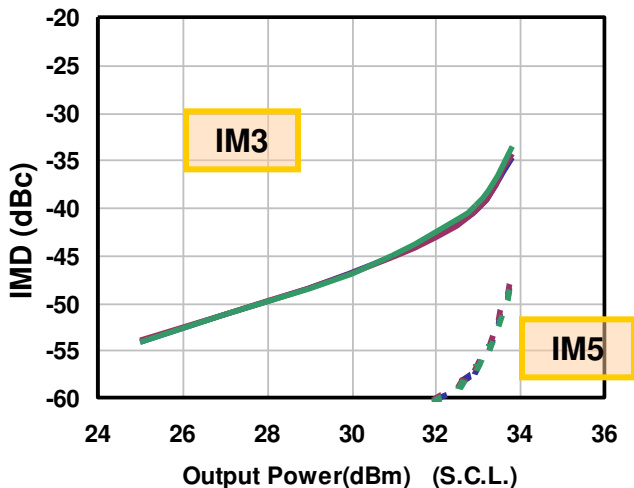
$V_{DS}(DC)=10V@7.9GHz$



—  $I_{ds}=2.2A$  —  $I_{ds}=2.6A$  —  $I_{ds}=3.0A$

IMD vs. Output Power by Temperature

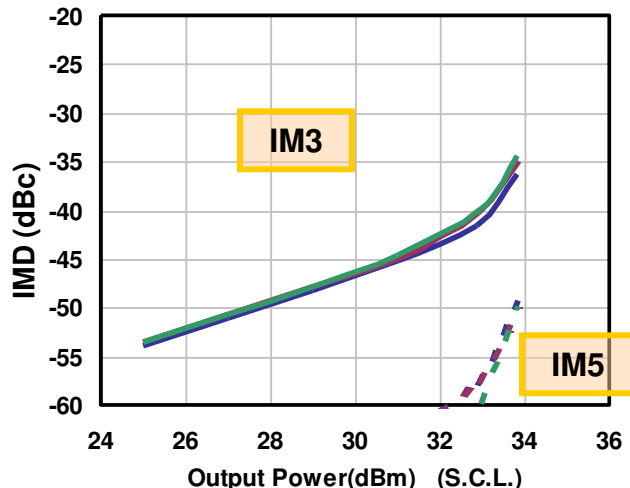
$V_{DS}(DC)=10V, I_{DS}(DC)=2.6A @ 7.1GHz$



— Tc = -40deg.C    — Tc = 20deg.C  
— Tc = 80deg.C

IMD vs. Output Power by Temperature

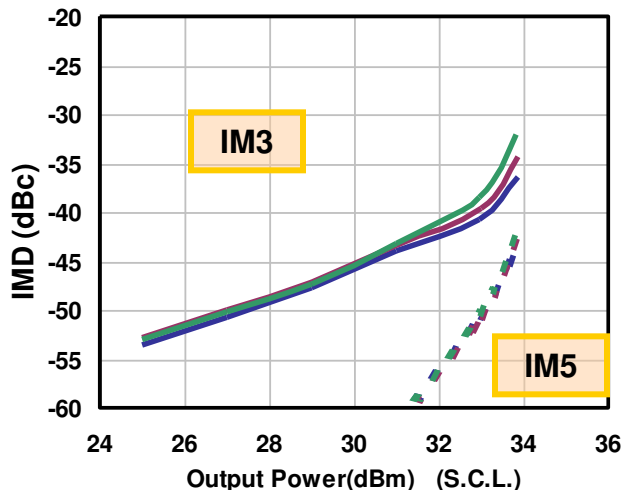
$V_{DS}(DC)=10V, I_{DS}(DC)=2.6A @ 7.5GHz$



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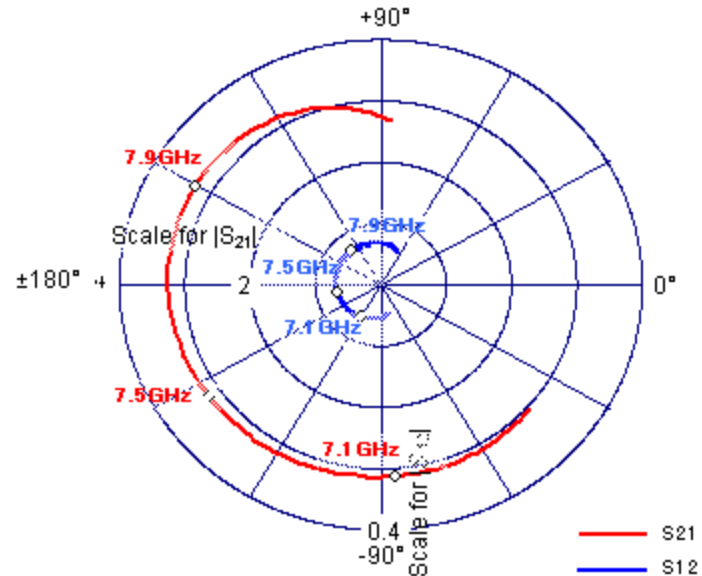
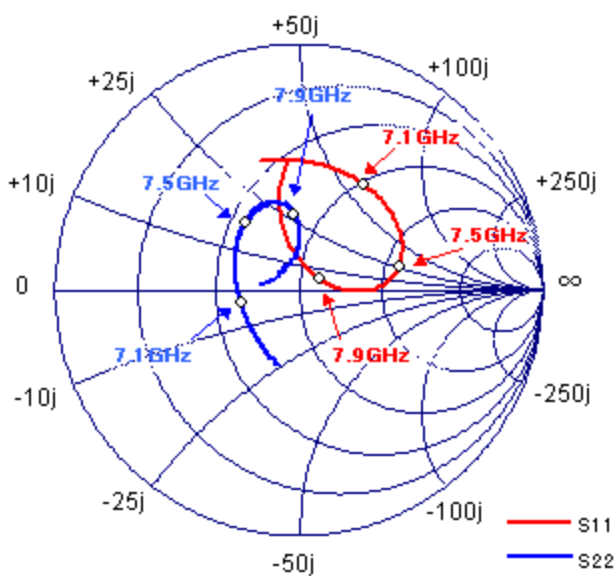
IMD vs. Output Power by Temperature

$V_{DS}(DC)=10V, I_{DS}(DC)=2.6A @ 7.9GHz$



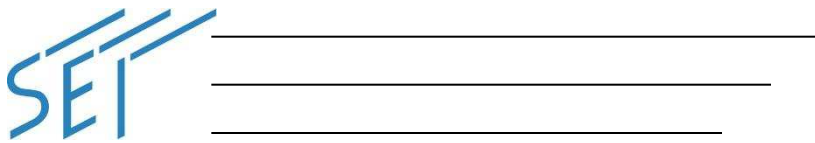
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### S-parameter



FREQ. (GHz)	S11		S21		S12		S22	
	mag	angle	mag	angle	mag	angle	mag	angle
6.9	0.526	88.2	3.092	-57.2	0.055	-90.3	0.274	-124.0
7.0	0.510	70.9	3.113	-72.5	0.059	-105.6	0.246	-146.4
7.1	0.503	57.7	3.136	-85.7	0.061	-117.4	0.242	-166.5
7.2	0.495	43.7	3.142	-100.7	0.063	-131.0	0.260	171.6
7.3	0.482	31.9	3.168	-116.1	0.064	-144.7	0.289	153.8
7.4	0.463	22.6	3.178	-129.3	0.066	-155.9	0.320	141.5
7.5	0.426	13.2	3.207	-145.1	0.067	-170.0	0.350	128.9
7.6	0.368	5.5	3.226	-161.3	0.068	175.8	0.371	118.4
7.7	0.299	-0.3	3.240	-175.4	0.069	162.0	0.374	109.7
7.8	0.193	-0.6	3.253	166.9	0.070	145.4	0.351	100.6
7.9	0.090	36.7	3.262	147.8	0.070	126.6	0.298	92.3
8.0	0.157	97.1	3.216	130.4	0.070	109.2	0.221	87.9
8.1	0.339	103.2	3.036	108.3	0.067	86.5	0.112	109.8





**ELM7179-10F**  
**C-band Internally Matched FET**

**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.