

Advance Information

The RF Small Signal Line

Silicon Lateral FET

N-Channel Enhancement-Mode MOSFET

Designed for use in low voltage, moderate power amplifiers such as portable analog and digital cellular radios and PC RF modems.

- Performance Specifications at 5.8 V, 900 MHz:
Output Power = 30 dBm Min
Power Gain = 10 dB Typ
Efficiency = 50% Min
- Guaranteed Ruggedness at Load VSWR = 20:1
- New Plastic Surface Mount Package
- Available in Tape and Reel Packaging.
T1 Suffix = 1,000 Units per 8 mm, 7 inch Reel
- Device Marking = 9745

MRF9745T1

30 dBm, 900 MHz
HIGH FREQUENCY
POWER TRANSISTOR
LDMOS FET



CASE 449-02, STYLE 1
(PLD-1)

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	35	Vdc
Drain-Gate Voltage ($R_{GS} = 1 \text{ M}\Omega$)	V_{DGO}	25	Vdc
Gate-Source Voltage	V_{GS}	± 10	Vdc
Drain Current – Continuous	I_D	2	Adc
Total Device Dissipation @ $T_C = 50^\circ\text{C}$ Derate above 50°C	P_D	10 100	W mW/ $^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 65 to +150	$^\circ\text{C}$
Operating Temperature Range	T_J	150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	10	$^\circ\text{C/W}$

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-Source Leakage Current ($V_{DS} = 35 \text{ V}$, $V_{GS} = 0$)	I_{DSS}	–	–	10	μAdc
Gate-Source Leakage Current ($V_{GS} = 5 \text{ V}$, $V_{DS} = 0$)	I_{GSS}	–	–	1	μAdc

NOTE – **CAUTION** – MOS devices are susceptible to damage from electrostatic charge. Reasonable precautions in handling and packaging MOS devices should be observed.



ELECTRICAL CHARACTERISTICS – continued ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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ON CHARACTERISTICS

Gate Threshold Voltage ($V_{DS} = 6\text{ V}$, $I_D = 25\text{ }\mu\text{A}$)	$V_{GS(th)}$	1	2	3	Vdc
Forward Transconductance ($V_{DS} = 6\text{ V}$, $I_D = 200\text{ mA}$)	g_{fs}	–	550	–	mmhos
Resistance Drain–Source ($V_{GS} = 4\text{ V}$, $I_D = 100\text{ mA}$)	$R_{DS(on)}$	–	1	2.5	Ω

DYNAMIC CHARACTERISTICS

Input Capacitance ($V_{DS} = 6\text{ V}$, $V_{GS} = 0$, $f = 1\text{ MHz}$)	C_{iss}	–	14	–	pF
Output Capacitance ($V_{DS} = 6\text{ V}$, $V_{GS} = 0$, $f = 1\text{ MHz}$)	C_{oss}	–	11	–	pF
Feedback Capacitance ($V_{DS} = 6\text{ V}$, $V_{GS} = 0$, $f = 1\text{ MHz}$)	C_{rss}	–	1.8	–	pF

FUNCTIONAL CHARACTERISTICS

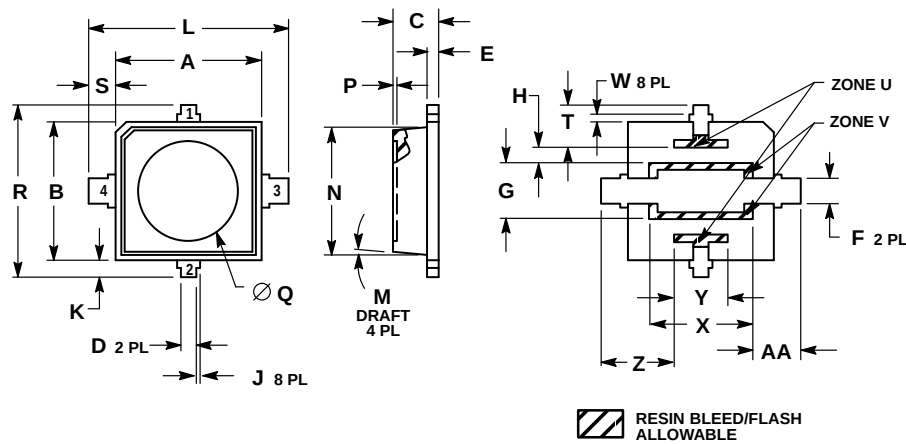
Power Gain ($V_{DD} = 5.8\text{ Vdc}$, $P_{in} = 20\text{ dBm}$, $I_{DQ} = 150\text{ mA}$, $f = 900\text{ MHz}$)	G_{ps}	9.5	10	–	dB
Drain Efficiency ($V_{DD} = 5.8\text{ Vdc}$, $P_{in} = 20\text{ dBm}$, $I_{DQ} = 150\text{ mA}$, $f = 900\text{ MHz}$)	η_D	50	55	–	%
Ruggedness Test ($V_{DD} = 5.8\text{ Vdc}$, $P_{in} = 20\text{ dBm}$, $I_{DQ} = 150\text{ mA}$, $f = 900\text{ MHz}$, Load VSWR = 20:1, All Phase Angles at Frequency Test)	Ψ	No Degradation in Output Power after Test			

Table 1. Large Signal Impedance
 $V_{DD} = 5.8\text{ V}$, $P_{in} = 20\text{ dBm}$, $I_{DQ} = 150\text{ mA}$

f MHz	Z_{in} Ohms	Z_{OL}^* Ohms
850	$7.0 - j6.4$	$6.1 - j5.1$
900	$5.2 - j6.5$	$5.9 - j4.6$
950	$5.2 - j6.0$	$6.1 - j4.7$

Z_{OL}^* is the conjugate of the optimum load impedance into which the device output operates at a given output power, voltage and frequency.

PACKAGE DIMENSIONS



- NOTES:
- 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 - 2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.185	0.195	4.70	4.95
B	0.175	0.185	4.44	4.70
C	0.058	0.064	1.47	1.63
D	0.017	0.023	0.43	0.58
E	0.014	0.017	0.36	0.43
F	0.027	0.033	0.69	0.84
G	0.071	0.077	1.80	1.96
H	0.017	0.023	0.43	0.58
J	0.000	0.007	0.00	0.18
K	0.018	0.026	0.46	0.66
L	0.253	0.263	6.43	6.68
M	5°REF		5°REF	
N	1.75 REF		4.44 REF	
P	0.000	0.006	0.00	0.15
Q	0.120	0.130	3.05	3.30
R	0.220	0.230	5.59	5.84
S	0.030	0.038	0.76	0.97
T	0.050	0.060	1.27	1.52
U	0.000	0.018	0.00	0.46
V	0.000	0.014	0.00	0.36
W	0.004	0.016	0.10	0.41
X	0.131	0.141	3.33	3.58
Y	0.065	0.075	1.65	1.90
Z	0.089	0.099	2.26	2.51
AA	0.056	0.066	1.42	1.67

CASE 449-02
ISSUE A

- STYLE 1:
- PIN 1. DRAIN
 - 2. GATE
 - 3. SOURCE
 - 4. SOURCE

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