Advance Information

The RF Small Signal Line

Silicon Lateral FET

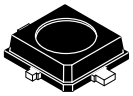
N–Channel Enhancement–Mode MOSFET

MRF9745T1

30 dBm, 900 MHz
HIGH FREQUENCY
POWER TRANSISTOR
LDMOS FET

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



CASE 449–02, STYLE 1
(PLD–1)

MAXIMUM RATINGS

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

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Drain–Source Leakage Current (V_{DS} = 35 V, V_{GS} = 0)	I_{DSS}	–	–	10	μAdc
Gate–Source Leakage Current (V_{GS} = 5 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°C unless otherwise noted)

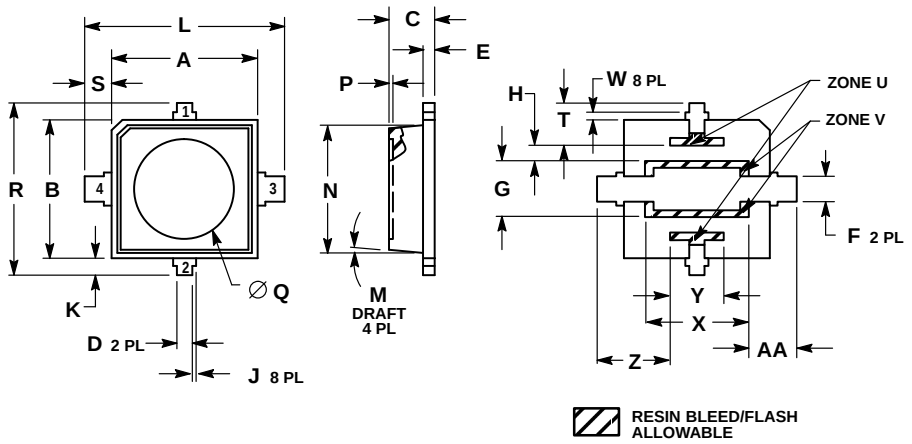
Characteristic	Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS					
Gate Threshold Voltage (V_{DS} = 6 V, I_D = 25 μA)	$V_{GS(th)}$	1	2	3	Vdc
Forward Transconductance (V_{DS} = 6 V, I_D = 200 mA)	g_{fs}	–	550	–	mmhos
Resistance Drain–Source (V_{GS} = 4 V, I_D = 100 mA)	$R_{DS(on)}$	–	1	2.5	Ω
DYNAMIC CHARACTERISTICS					
Input Capacitance (V_{DS} = 6 V, V_{GS} = 0, f = 1 MHz)	C_{iss}	–	14	–	pF
Output Capacitance (V_{DS} = 6 V, V_{GS} = 0, f = 1 MHz)	C_{oss}	–	11	–	pF
Feedback Capacitance (V_{DS} = 6 V, V_{GS} = 0, f = 1 MHz)	C_{rss}	–	1.8	–	pF
FUNCTIONAL CHARACTERISTICS					
Power Gain (V_{DD} = 5.8 Vdc, P_{in} = 20 dBm, I_{DQ} = 150 mA, f = 900 MHz)	G_{ps}	9.5	10	–	dB
Drain Efficiency (V_{DD} = 5.8 Vdc, P_{in} = 20 dBm, I_{DQ} = 150 mA, f = 900 MHz)	η_D	50	55	–	%
Ruggedness Test (V_{DD} = 5.8 Vdc, P_{in} = 20 dBm, I_{DQ} = 150 mA, f = 900 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 V, P_{in} = 20 dBm, I_{DQ} = 150 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.

	INCHES		MILLIMETERS	
DIM	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

How to reach us:
USA / EUROPE / Locations Not Listed: Motorola Literature Distribution;
P.O. Box 5405, Denver, Colorado 80217. 303–675–2140 or 1–800–441–2447

Mfax™: RMFAX0@email.sps.mot.com – TOUCHTONE 602–244–6609
INTERNET: http://www.mot.com/sps/

JAPAN: Nippon Motorola Ltd.; Tatsumi–SPD–JLDC, 6F Seibu–Butsuryu–Center,
3–14–2 Tatsumi Koto–Ku, Tokyo 135, Japan. 81–3–3521–8315

ASIA / PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852–26629298