

Advance Information
**The RF Small Signal Line
Silicon Lateral FET
N-Channel Enhancement-Mode MOSFET**

MRF9745T1

**30 dBm, 900 MHz
HIGH FREQUENCY
POWER TRANSISTOR
LD MOS 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 ($R_{GS} = 1 M\Omega$)	V_{DGO}	25	Vdc
Gate-Source Voltage	V_{GS}	± 10	Vdc
Drain Current - Continuous	I_D	2	Adc
Total Device Dissipation @ $T_C = 50^\circ C$ Derate above $50^\circ C$	P_D	10 100	W mW/ $^\circ C$
Storage Temperature Range	T_{stg}	- 65 to +150	$^\circ C$
Operating Temperature Range	T_J	150	$^\circ C$

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS ($T_C = 25^\circ C$ 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	μA_{dc}
Gate-Source Leakage Current ($V_{GS} = 5 V, V_{DS} = 0$)	I_{GSS}	-	-	1	μA_{dc}

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
ON CHARACTERISTICS					
Gate Threshold Voltage ($V_{DS} = 6\text{ V}$, $I_D = 25\ \mu\text{A}$)	$V_{GS(th)}$	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

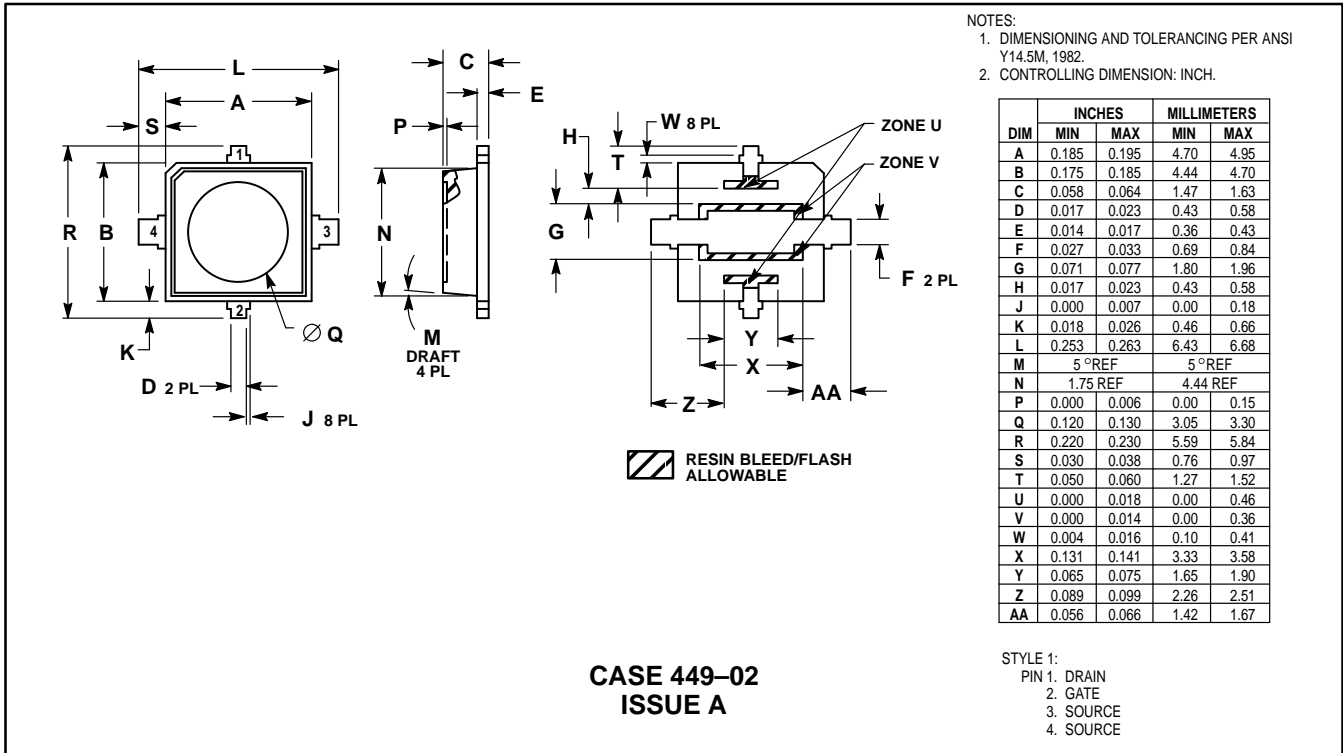
Power Gain ($V_{DD} = 5.8\text{ Vdc}$, $P_{in} = 20\text{ dBm}$, $I_{DQ} = 150\text{ mA}$, $f = 900\text{ MHz}$)	G_{ps}	9.5	10	–	dB
Drain Efficiency ($V_{DD} = 5.8\text{ Vdc}$, $P_{in} = 20\text{ dBm}$, $I_{DQ} = 150\text{ mA}$, $f = 900\text{ MHz}$)	η_D	50	55	–	%
Ruggedness Test ($V_{DD} = 5.8\text{ Vdc}$, $P_{in} = 20\text{ dBm}$, $I_{DQ} = 150\text{ mA}$, $f = 900\text{ MHz}$, 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



Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

Mfax is a trademark of Motorola, Inc.

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

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

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

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



MRF9745T1/D