PRODUCT NAME : IRF610 3.3A 200V N-C
hannel Power MOSFET

PRICE : Rs 39.00
SKU : RM2122

DESCRIPTION

Features

- Drain-Source Volt (Vds): 200V
- Gate-Source Volt (Vgs): 200V
- Gate-Source Volt (Vgs): 20V
- Drain Current (Id): 3.3A
- Power Dissipation (Ptot): 43W
- Type: N-Channel

intersil

IRF610

Data Sheet | June 1999 | File Number 1576.3

3.3A, 200V, 1.500 Ohm, N-Channel Power MOSFET

This N-Channel enhancement mode silicon gate power field effect transistor is an advanced power MOSFET designed, tested, and guaranteed to withstand a specified level of energy in the breakdown avalanche mode of operation. All of these power MOSFETs are designed for applications such as switching regulators, switching convertors, motor drivers, relay drivers, and drivers for high power bipolar switching transistors requiring high speed and low gate drive power. These types can be operated directly from integrated circuits.

Formerly developmental type TA17442.

Ordering Information

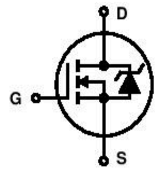
PART NUMBER	PACKAGE	BRAND
IRF610	TO-220AB	IRF610

NOTE: When ordering, use the entire part number.

Features

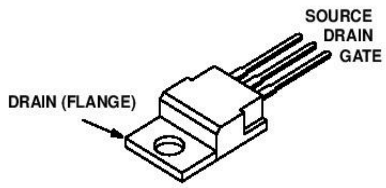
- 3.3A, 200V
- $r_{DS(ON)} = 1.500\Omega$
- Single Pulse Avalanche Energy Rated
- SOA is Power Dissipation Limited
- Nanosecond Switching Speeds
- Linear Transfer Characteristics
- High Input Impedance
- Related Literature
  - TB334 "Guidelines for Soldering Surface Mount Components to PC Boards"

Symbol



Packaging

JEDEC TO-220AB



CAUTION: These devices are sensitive to electrostatic discharge; follow proper ESD Handling Procedures.
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Absolute Maximum Ratings $T_C = 25^oC$, Unless Otherwise Specified

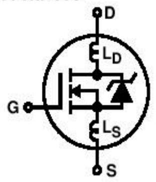
		IRF610	UNITS
Drain to Source Voltage (Note 1)	V_{DS}	200	V
Drain to Gate Voltage ($R_{GS} = 20k\Omega$) (Note 1)	V_{DGR}	200	V
Continuous Drain Current	I_D	3.3	A
$T_C = 100^oC$	I_D	2.1	A
Pulsed Drain Current (Note 2)	I_{DM}	8	A
Gate to Source Voltage	V_{GS}	±20	V
Maximum Power Dissipation	P_D	43	W
Linear Derating Factor		0.34	$W/^oC$
Single Pulse Avalanche Energy Rating (Note 4)	E_{AS}	46	mJ
Operating and Storage Temperature	T_J, T_{STG}	-55 to 150	^oC
Maximum Temperature for Soldering			
Leads at 0.063in (1.6mm) from Case for 10s	T_L	300	^oC
Package Body for 10s, See Techbrief 334	T_{pkg}	260	^oC

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTE:

1. $T_J = 25^oC$ to 125^oC.

Electrical Specifications $T_C = 25^oC$, Unless Otherwise Specified

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Drain to Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V$, $I_D = 250\mu A$ (Figure 10)	200	-	-	V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	2	-	4	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = Max Rating, $V_{GS} = 0V$	-	-	25	µA
		V_{DS} = Max Rating x 0.8, $V_{GS} = 0V$, $T_J = 125^oC$	-	-	250	µA
On-State Drain Current (Note 2)	$I_{D(ON)}$	$V_{DS} > I_{D(ON)} \times r_{DS(ON)MAX}$, $V_{GS} = 10V$ (Figure 7)	3.3	-	-	A
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V$	-	-	±100	nA
Drain to Source On Resistance (Note 2)	$r_{DS(ON)}$	$V_{GS} = 10V$, $I_D = 1.6A$ (Figures 8, 9)	-	1.0	1.5	Ω
Forward Transconductance (Note 2)	g_{fs}	$V_{DS} \geq 50V$, $I_D = 1.6A$ (Figure 12)	0.8	1.3	-	S
Turn-On Delay Time	$t_{d(ON)}$	$V_{DD} = 100V$, $I_D \approx 3.3A$, $R_G = 24\Omega$, $R_L = 30\Omega$ MOSFET Switching Times are Essentially Independent of Operating Temperature	-	8	12	ns
Rise Time	t_r		-	17	26	ns
Turn-Off Delay Time	$t_{d(OFF)}$		-	13	21	ns
Fall Time	t_f		-	9	13	ns
Total Gate Charge (Gate to Source + Gate to Drain)	$Q_{g(TOT)}$	$V_{GS} = 10V$, $I_D = 3.3A$, V_{DS} = 0.8 x Rated BV_{DSS}, $I_{g(REF)} = 1.5mA$ (Figure 14) Gate Charge is Essentially Independent of Operating Temperature	-	5.3	8.2	nC
Gate to Source Charge	Q_{gs}		-	1.2	-	nC
Gate to Drain "Miller" Charge	Q_{gd}		-	3.0	-	nC
Input Capacitance	C_{ISS}	$V_{GS} = 0V$, $V_{DS} = 25V$, f = 1MHz (Figure 11)	-	135	-	pF
Output Capacitance	C_{OSS}		-	60	-	pF
Reverse Transfer Capacitance	C_{RSS}		-	16	-	pF
Internal Drain Inductance	L_D	Measured From the Contact Screw on Tab to Center of Die; Modified MOSFET Symbol Showing the Internal Device Inductances 	-	3.5	-	nH
		Measured From the Drain Lead, 6mm (0.25in) From Package to Center of Die	-	4.5	-	nH
Internal Source Inductance	L_S	Measured From the Source Lead, 6mm (0.25in) from Header to Source Bonding Pad	-	7.5	-	nH
Thermal Resistance Junction to Case	$R_{\theta JC}$		-	-	2.9	$^oC/W$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	Free Air Operation	-	-	80	$^oC/W$