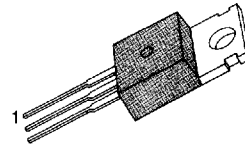


## FEATURES

- Lower  $R_{DS(ON)}$
- Excellent voltage stability
- Fast switching speeds
- Rugged polysilicon gate cell structure
- Lower input capacitance
- Extended safe operating area
- Improved high temperature reliability
- TO-220 Package

TO-220



1. Gate 2. Drain 3. Source

## PRODUCT SUMMARY

Part Number	$V_{DSS}$	$R_{DS(on)}$	$I_D$
IRLZ44	60V	0.04 $\Omega$	35A
IRLZ40	50V	0.04 $\Omega$	35A

## ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	IRLZ34	IRLZ30	Unit
Drain-Source Voltage (1)	$V_{DSS}$	60	50	Vdc
Drain-Gate Voltage ( $R_{GS}=1M\Omega$ )(1)	$V_{DGR}$	60	50	Vdc
Gate-Source Voltage	$V_{GS}$	$\pm 15$		Vdc
Continuous Drain Current $T_c=25^\circ C$	$I_D$	35.0		Adc
Continuous Drain Current $T_c=100^\circ C$	$I_D$	27.0		Adc
Drain Current - Pulsed (3)	$I_{DM}$	140		Adc
Total Power Dissipation @ $T_c=25^\circ C$	$P_D$	150		Watts
Derate Above $25^\circ C$		1.0		W/ $^\circ C$
Operating and Storage Junction Temperature Range	$T_J, T_{STG}$	-55 to +175		$^\circ C$
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	$T_L$	300		$^\circ C$

Notes : (1)  $T_J=25^\circ C$  to  $175^\circ C$

(2) Pulse test : Pulse width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$

(3) Repetitive rating : Pulse width limited by junction temperature

**ELECTRICAL CHARACTERISTICS** (T<sub>C</sub>=25°C unless otherwise specified)

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage					
	IRLZ44	60	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA
	IRLZ40	50	-	-	V	
V <sub>GS(th)</sub>	Gate Threshold Voltage	1.0	-	2.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA
I <sub>GSS</sub>	Gate-Source Leakage Forward	-	-	100	nA	V <sub>GS</sub> =15V
I <sub>GSS</sub>	Gate-Source Leakage Reverse	-	-	-100	nA	V <sub>GS</sub> =-15V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	-	-	250	μA	V <sub>DS</sub> =Max. Rating, V <sub>GS</sub> =0V
		-	-	1000	μA	V <sub>DS</sub> =0.8 Max. Rating, V <sub>GS</sub> =0V, T <sub>C</sub> =125°C
R <sub>DS(on)</sub>	Static Drain-Source On-Resistance(2)	-	-	0.04	Ω	V <sub>GS</sub> =5.0V, I <sub>D</sub> =18.0A
g <sub>fs</sub>	Forward Transconductance (2)	15.0	-	-	Ω	V <sub>DS</sub> ≥ 15V, I <sub>D</sub> =18.0A
C <sub>iss</sub>	Input Capacitance	-	2400	-	pF	V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz
C <sub>oss</sub>	Output Capacitance	-	795	-	pF	
C <sub>rss</sub>	Reverse Transfer Capacitance	-	390	-	pF	
t <sub>d(on)</sub>	Turn-On Delay Time	-	25	40	ns	V <sub>DD</sub> =0.5 BV <sub>DSS</sub> , I <sub>D</sub> =3.5A, Z <sub>θ</sub> =9.1Ω (MOSFET switching times are essentially independent of operating temperature)
t <sub>r</sub>	Rise Time	-	65	85	ns	
t <sub>d(off)</sub>	Turn-Off Delay Time	-	350	400	ns	
t <sub>f</sub>	Fall Time	-	180	200	ns	
Q <sub>g</sub>	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	80	nC	V <sub>GS</sub> =5V, I <sub>D</sub> =35A, V <sub>DS</sub> =0.8 Max. Rating (Gate charge is essentially independent of operating temperature)
Q <sub>gs</sub>	Gate-Source Charge	-	20	-	nC	
Q <sub>gd</sub>	Gate-Drain Charge	-	30	-	nC	

**THERMAL RESISTANCE**

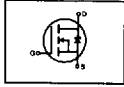
Symbol	Characteristics		All	Units	Remark
R <sub>thJC</sub>	Junction-to-Case	MAX	1.0	K/W	
R <sub>thCS</sub>	Case-to-Sink	TYP	0.5	K/W	Mounting surface flat, smooth, and greased
R <sub>thJA</sub>	Junction-to-Ambient	MAX	62.5	K/W	Free Air Operation

Notes : (1) T<sub>J</sub>=25°C to 175°C

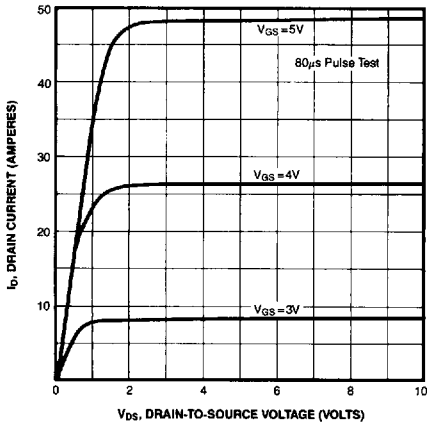
(2) Pulse test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%

(3) Repetitive rating : Pulse width limited by max. junction temperature

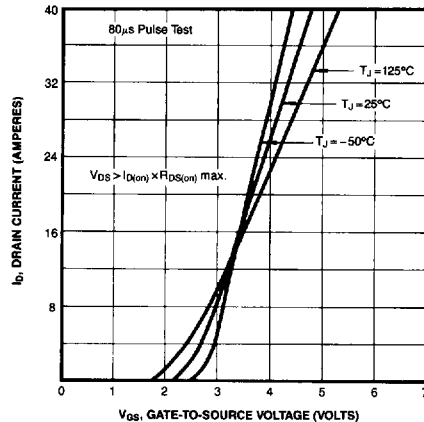
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
$I_S$	Continuous Source Current (Body Diode)	-	-	35.0	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
$I_{SM}$	Pulse Source Current (Body Diode) (3)	-	-	140	A	
$V_{SD}$	Diode Forward Voltage (2)	-	1.3	2.5	V	$T_J=25^\circ\text{C}$ , $I_S=35.0\text{A}$ , $V_{GS}=0\text{V}$
$t_r$	Reverse Recovery Time	-	-	600	ns	$T_J=25^\circ\text{C}$ , $I_F=35.0\text{A}$ , $dI_F/dt=100\text{A}/\mu\text{S}$

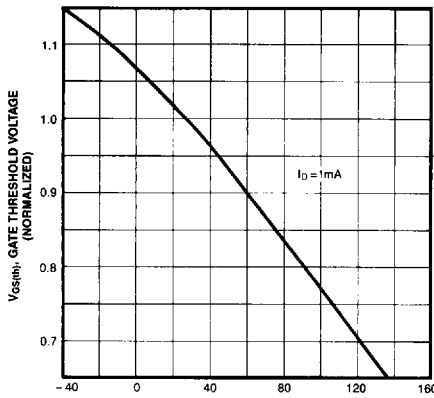
- Notes : (1)  $T_J=25^\circ\text{C}$  to  $175^\circ\text{C}$   
 (2) Pulse test : Pulse width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$   
 (3) Repetitive rating : Pulse width limited by max. junction temperature



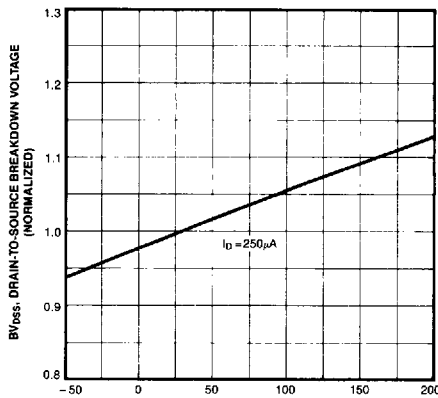
TYPICAL SATURATION CHARACTERISTICS



TYPICAL TRANSFER CHARACTERISTICS



NORMALIZED  $V_{(th)}$  VOLTAGE  $V_S$ . TEMPERATURE



BREAKDOWN VOLTAGE  $V_S$ . TEMPERATURE

