

MICRO

T-39-11

IRF630
IRF631
IRF632
IRF633

HIGH POWER MOSFETs

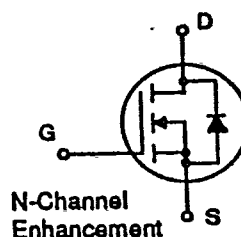
APPLICATIONS

- SWITCHING REGULATORS
- MOTOR DRIVERS
- CONVERTERS

Part Number	V _{DS}	R _{DS(on)}	I _D
IRF630	200V	0.4Ω	9.0A
IRF631	150V	0.4Ω	9.0A
IRF632	200V	0.6Ω	8.0A
IRF633	150V	0.6Ω	8.0A

FEATURES

- DIRECTLY COMPATIBLE WITH IRF STANDARD PRODUCTS
- FAST SWITCHING TIMES
- LOW R_{DS} AT HIGH VOLTAGE
- LOW DRIVE REQUIREMENTS
- COMPATIBLE WITH INDUCTIVE LOADS

N-Channel
Enhancement

CASE TO-220B



MAXIMUM RATINGS

Rating		Symbol	Value				Unit
			630	631	632	633	
Drain-Source Voltage ①		V _{DSS}	200	150	100	150	V
Drain-Gate Voltage R _{GS} = 1 MΩ		V _{DGR}	200	150	100	150	V
Gate-Source Voltage		V _{GS}	±20	±20	±20	±20	V
Drain Current	T _C = 25°C	I _D	9.0	9.0	8.0	8.0	A
	Continuous	T _C = 100°C	I _D	6.0	6.0	5.0	A
	Pulsed ②	T _C = 25°C	I _{DM}	36	36	32	A
Total Power Dissipation @ T _C = 25°C Derate above 25°C		P _D	75	75	75	75	W
Operating and Storage Temperature Range		T _J , T _{stg}	-55/ 150	-55/ 150	-55/ 150	-55/ 150	°C
Maximum Lead Temp. for Soldering (1/16" from case for 10 seconds)		T _L	300	300	300	300	°C

THERMAL RESISTANCE

		Min	Typ	Max	
Junction-to-case	R _{θJC}	All	-	-	1.67 °C/W
Junction-to-ambient To-220 Free Air Operation	R _{θJA}	All	-	-	80 °C/W

① T_J = 25°C to 150°C

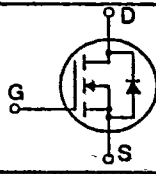
MICRO ELECTRONICS LTD.

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KWUN TONG P. O. BOX 69477 CABLE ADDRESS "MICROTRON"
TEL. 3-430181-5 FAX. NO. 3-410321

ELECTRICAL CHARACTERISTICS @ $T_C = 25^\circ\text{C}$ unless otherwise specified

Parameter	Type	Min	Typ.	Max.	Units	Test Conditions
BV _{DSS} Drain-Source Breakdown Voltage	IRF630 IRF632	200	-	-	V	V _{GS} = 0V I _D = 250 μ A
	IRF631 IRF633	150	-	-	V	
V _{GS(th)} Gate Threshold Voltage	ALL	2.0	-	4.0	V	V _{DS} = V _{GS} , I _D = 250 μ A
I _{GSS} Gate-Source Leakage Forward	ALL	-	-	500	nA	V _{GS} = 20V
I _{GSS} Gate-Source Leakage Reverse	ALL	-	-	-500	nA	V _{GS} = 20V
I _{DSS} Zero Gate Voltage Drain Current	ALL	-	-	250	μ A	V _{DS} = Max. Rating, V _{GS} = 0V
		-	-	1000	μ A	V _{DS} = Max. Rating $\times$ 0.8, V _{GS} = 0V, TC = 125 $^\circ$ C
R _{DS(on)} Static Drain-Source On-State Resistance ②	IRF630 IRF631	-	0.25	0.4	Ω	V _{GS} = 10V, I _D = 2.5A
	IRF632 IRF633	-	0.4	0.6	Ω	
I _{D(on)} On-State Drain Current ②	IRF630 IRF631	9.0	-	-	A	V _{DS} $\geq$ V _{DS(ON)} , V _{GS} = 10V
	IRF632 IRF633	8.0	-	-	A	
g _{fs} Forward Transconductance ②	ALL	3.0	4.8	-	Ω	V _{DS} $\geq$ V _{DS(ON)} , I _D = 2.5A
C _{iss} Input Capacitance	ALL	-	600	800	pF	V _{GS} = 0V, V _{DS} = 25V, f = 1.0 MHz
C _{oss} Output Capacitance	ALL	-	250	450	pF	
C _{rss} Reverse Transfer Capacitance	ALL	-	80	150	pF	
t _{d(on)} Turn-On Delay Time	ALL	-	-	30	nS	V _{DD} = 0.5 BV _{DSS} , I _D = 5.0A, Z ₀ = 15 Ω
t _r Rise Time	ALL	-	-	50	nS	
t _{d(off)} Turn-Off Delay Time	ALL	-	-	50	nS	
t _f Fall Time	ALL	-	-	40	nS	
Q _g Total Gate Charge (Gate-Source Plus Gate-Drain)	ALL	-	18	30	nC	V _{GS} = 10V, I _D = 12.0A, V _{DS} = 0.8 Max. Rating.
Q _{gs} Gate-Source Charge	ALL	-	10	-	nC	
Q _{gd} Gate-Drain ("Miller") Charge	ALL	-	9.0	-	nC	

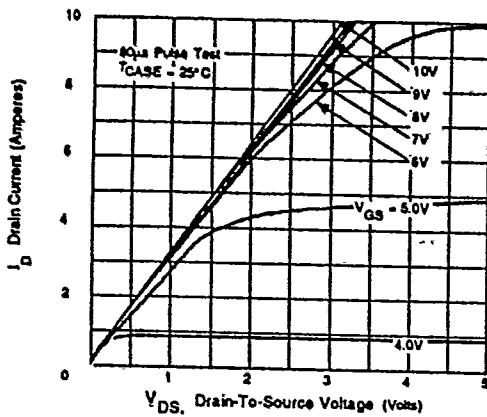
BODY DIODE RATINGS AND CHARACTERISTICS

I _S Continuous Source Current (Body Diode)	IRF630,631	-	9.0	A	P-N diode is connected between D & S.	
	IRF632,633	-	8.0	A		
I _{SM} Pulse Source Current ③ (Body Diode)	IRF630,631	-	36	A		
	IRF632,633	-	32	A		
V _{SD} Diode Forward Voltage ②	IRF630,631	-	2.0	V	T _C = 25 $^\circ$ C, I _S = -4.5A, V _{GS} = 0V	
	IRF632,633	-	1.8	V		
t _{rr} Reverse Recovery Time	ALL	400	-	ns	T _J = 150 $^\circ$ C, I _F = I _S = 4.5A dI _F /ds = 100 A/ μ s	

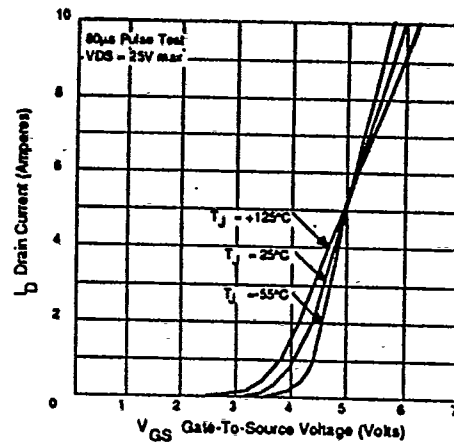
② Pulse Width < 300 μ sec. Duty Cycle < 2%

③ Repetitive Rating: Pulse width limited by maximum junction temperature.

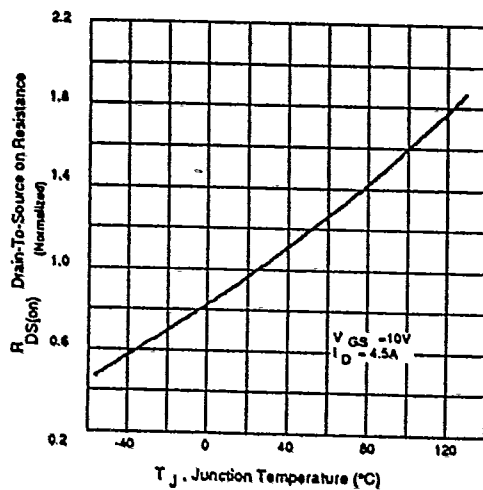
TYPICAL CHARACTERISTICS



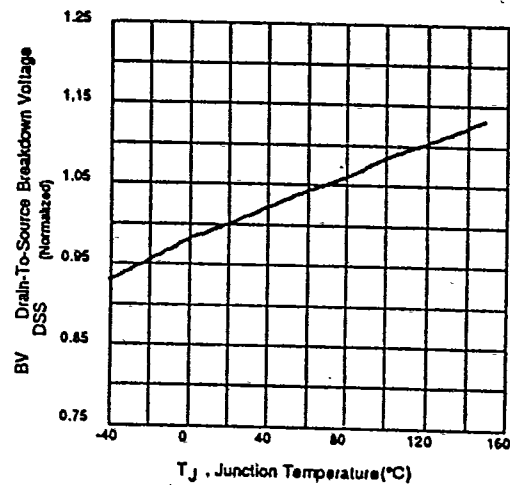
Typical Output Characteristics



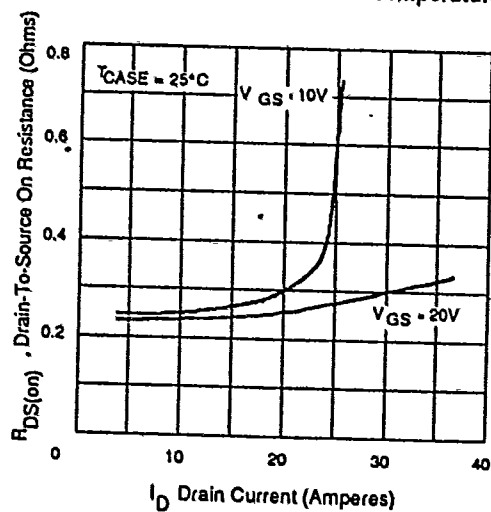
Typical Transfer Characteristics



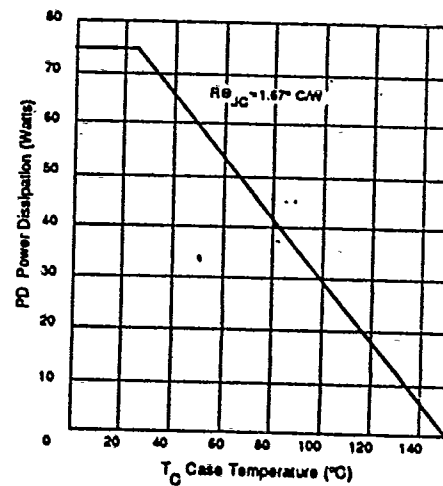
Normalized On-Resistance Vs. Temperature



Breakdown Voltage Vs. Temperature



Typical On-Resistance Vs. Drain Current



Power Vs. Temperature Derating Curve