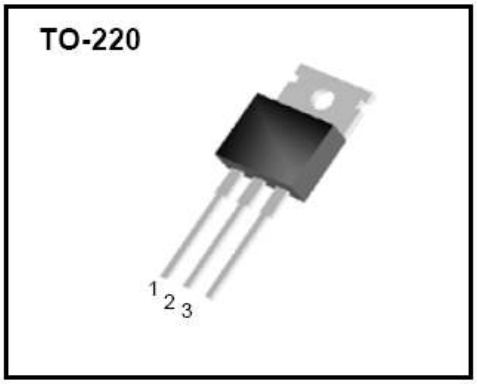
N-Channel MOSFET

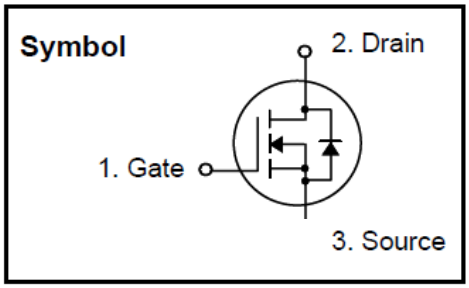
Features

- $R_{DS(ON)}$ Max 0.55 ohm at V_{GS} = 10V
- Gate Charge (Typical 46nC)
- Improve dv/dt capability, Fast switching
- 100% avalanche Tested



General Description

This MOSFET is produced using advanced planar strip DMOS technology. This latest technology has been especially designed to minimize on-state resistance have a high rugged avalanche characteristics. These device are well suited for half bridge and full bridge resonant topology like to electronic lamp ballast.



Absolute Maximum Ratings (T_J = 25℃ **unless otherwise specified)**

Symbol	Parameter		Ratings	Units
V_{DSS}	Drain-Source Voltage		400	V
I_D	Drain Current T_C=25℃		10	A
	T_C=100℃		6.3	
V_{GSS}	Gate-Source Voltage		± 30	V
I_{DM}	Drain Current pulse	(Note 1)	40	A
E_{AS}	Single Pulse Avalanche Energy	(Note 2)	680	mJ
E_{AR}	Repetitive Avalanche Energy	(Note 1)	12.5	mJ
dv/dt	Peak diode Recovery dv/dt	(Note 3)	5.0	V/ns
P_D	Power Dissipation T_C=25℃		125	W
T_j, T_{STG}	Operation and Storage Temperature range		-45 ~ 150	℃

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{\Theta JC}$	Thermal Resistance Junction to Case	1.0	℃/W
$R_{\Theta CS}$	Thermal Resistance Case to Sink Typ.	0.5	℃/W
$R_{\Theta JA}$	Thermal Resistance Junction to Ambient	62.0	℃/W

Electrical Characteristics (TC = 25℃ Unless otherwise noted)

Symbol	Items	Conditions	Ratings			Unit
			Min	Typ.	Max	
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_D = 250uA	400			V
ΔBV_{DSS} /ΔT_J	Breakdown Voltage Temperature coefficient	I_D =250uA, Reference to 25℃		0.5		V/℃
I_{DSS}	Zero gate voltage Drain Current	V_{DS} = 400V, V_{GS} = 0V V_{DS} = 320V, T_S = 125℃			1 10	uA
I_{GSSF}	Gate body leakage current Forward	V_{GS} = 30V, V_{DS} = 0V			100	nA
I_{GSSR}	Gate body leakage current Reverse	V_{GS} = -30V, V_{DS} = 0V			-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 250uA	2.0		4.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS} = 10V, I_D = 5.0A			0.55	Ω

Dynamic Characteristics

C_{iss}	Input Capacitance	V_{DS} = 25 V, V_{GS} = 0V f = 1.0MHz		1470		pF
C_{oss}	output Capacitance			170		pF
C_{rss}	Reverse Transfer Capacitance			40		pF

Switching Characteristics

Symbol	Items	Conditions	Min	Typ.	Max	Units
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 200V, I_D = 10.0A R_G = 25 Ω (note 4,5)			50	ns
t_r	Turn-on Rise Time				50	ns
$t_{d(off)}$	Turn-off Delay Time				270	ns
t_f	Turn-off Fall Time				80	ns
Q_g	Total Gate Charge	V_{DS} = 320V, I_D = 10.0A V_{GS} = 10V (note 4,5)		48		nC
Q_{gs}	Gate-Source Charge			8.0		nC
Q_{gd}	Gate-Drain Charge			19.0		nC

Drain-Source Diode Characteristics

I_S	Maximum Continuous Drain-Source diode Forward Current				10	A
I_{SM}	Maximum Pulse Drain-Source diode Forward Current				40.0	A
V_{SD}	Drain-Source diode Forward voltage	V_{GS} = 0V, I_s = 10.0A			2.0	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V, I_s = 10.0A dI_F/dt =100 A/us (note 4)		280		nS
Q_{rr}	Reverse Recovery Charge			2.7		uC

Notes

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. L = 12mH, I_{AS} = 10.0A, V_{DD} = 50V, R_G = 25 Ω, starting T_J = 25℃
3. I_{SD} ≤ 10.0A, di/dt ≤ 300A/us, V_{DD} ≤ BV_{DSS} , starting T_J = 25℃
4. Pulse Test : Pulse width ≤ 300us, Duty cycle ≤ 2%
5. Essentially independent of operation temperature

Fig. 1 On-State Characteristics

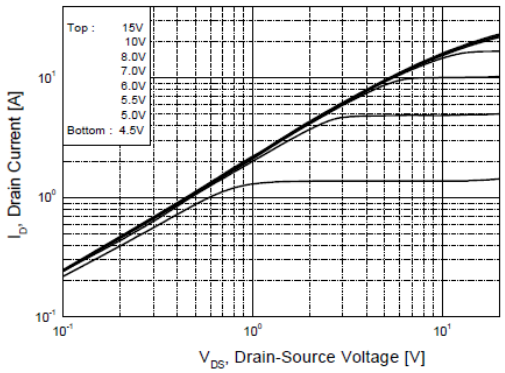


Fig. 2 On-Resistance variation vs Drain Current And gate Voltage

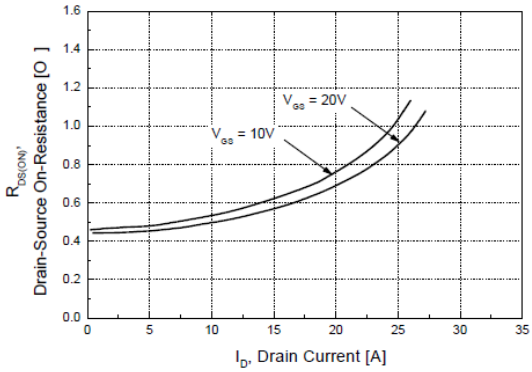


Fig. 3 Breakdown Voltage Variation vs Temperature

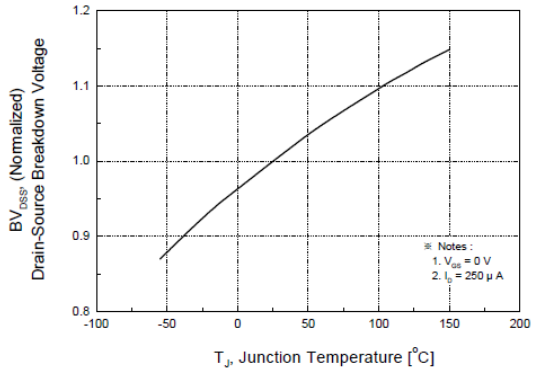


Fig 4. On-Resistance Variation vs Temperature

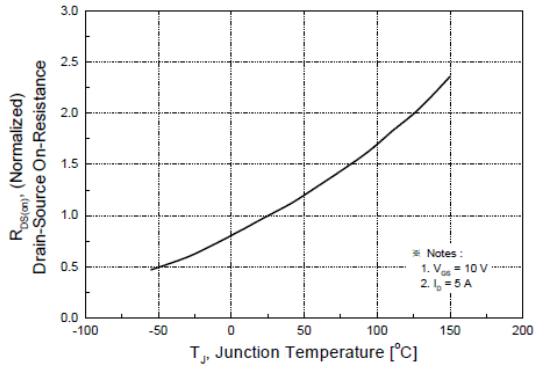
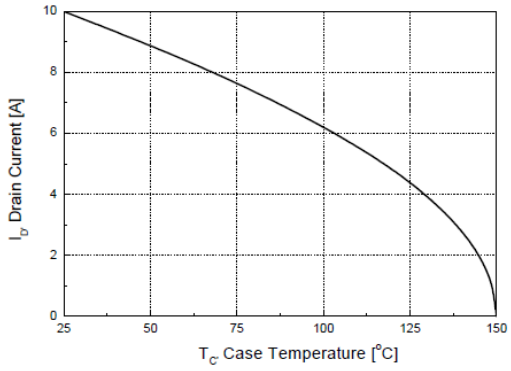


Fig. 5 Maximum Drain Current vs Case Temp.



TO-220 Package Dimension

Dim.	mm			Inch		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.7		10.1	0.382		0.398
B	6.3		6.7	0.248		0.264
C	9.0		9.47	0.354		0.373
D	12.8		13.3	0.504		0.524
E	1.2		1.4	0.047		0.055
F		1.7			0.067	
G		2.5			0.098	
H	3.0		3.4	0.118		0.134
I	1.25		1.4	0.049		0.055
J	2.4		2.7	0.094		0.106
K	5.0		5.15	0.197		0.203
L	2.2		2.6	0.087		0.102
M	1.25		1.55	0.049		0.061
N	0.45		0.6	0.018		0.024
O	0.6		1.0	0.024		0.039
ϕ		3.6			0.142