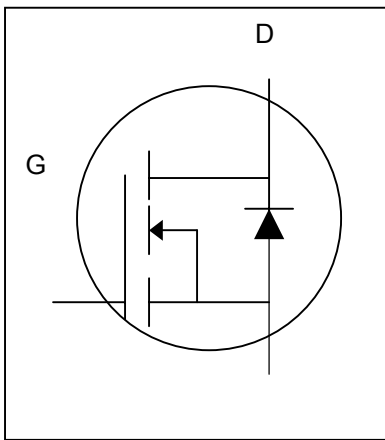


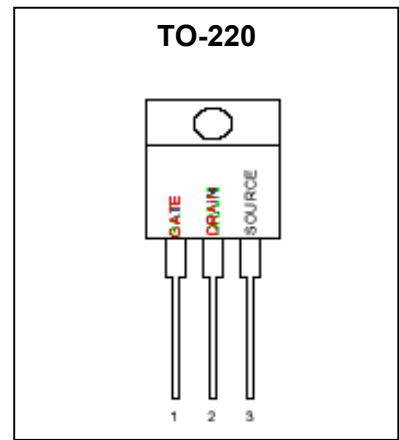
- Advanced Process Technology
- Ultra low On-Resistance Provides Higher Efficiency
- Avalanche Energy Specified
- Source-to-Drain Diode Recovery Time Comparable to a Discrete Fast Recovery Diode
- Diode is Characterized for Use in Bridge Circuits
- IDSS and VDS (on) Specified at Elevated Temperature

DESCRIPTION

This high voltage MOSFET used an advanced termination scheme to provide enhanced voltage-blocking capability without degrading performance over time. In addition, this advanced MOSFET is designed to withstand high energy in avalanche and commutation time. Designed for high voltage, high speed switching application in power supplies, converters and PWM motor controls, these devices are particularly well suited for bridge circuits where diode speed and commutating safe operation areas critical and offer additional and safety margin against unexpected voltage transients.



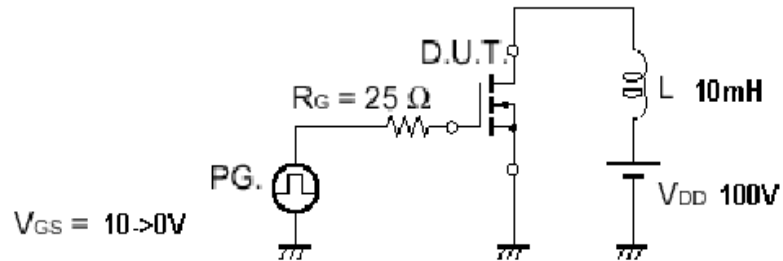
V_{DSS} = 600V
R_{DS (on)} = 1.2 Ω
I_D = 6.0 A



ABSOLUTE MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain to Current – Continuous	I _D	6.0	A
Gate-to-Source Voltage – Continue - Non-repetitive	V _{GS} V _{GSM}	+/- 20 +/- 40	V V
Total Power Dissipation Derate Above 25°C	P _D	125 1.0	W W/°C
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C
Single Pulse Drain-to-Source Avalanche Energy – T _J = 25 °C (V _{DD} = 100V, V _{GS} = 10V, I _L =6A, L = 10mH, R _G =25Ω)	E _{AS}	180	mJ
Thermal Resistance – Junction to Case - Junction to Ambient	θ _{JC} θ _{JA}	1.0 62.5	°C/W
Maximum Led Temperature for Solding Purpose, 1/8" from case for 10 seconds	T _L	260	°C

TEST CIRCUIT



Test Circuit – Avalanche Capability

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, $T_J = 25^\circ\text{C}$.

Characteristic		Symbol	B06N60			Units
			Min	Typ	Max	
Drain-Source Breakdown Voltage ($V_{GS} = 0\text{ V}$, $I_D = 250\ \mu\text{A}$)		$V_{(BR)DSS}$	600			V
Drain-Source Leakage Current ($V_{DS} = 600\text{ V}$, $V_{GS} = 0\text{ V}$) ($V_{DS} = 480\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 125^\circ\text{C}$)		I_{DSS}			100 50	μA
Gate-Source Leakage Current-Forward ($V_{gsf} = 20\text{ V}$, $V_{DS} = 0\text{ V}$)		I_{GSSF}			100	nA
Gate-Source Leakage Current-Reverse ($V_{gsr} = 20\text{ V}$, $V_{DS} = 0\text{ V}$)		I_{GSSR}			100	nA
Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$)		$V_{GS(th)}$	2.0		4.0	V
Static Drain-Source On-Resistance ($V_{GS} = 10\text{ V}$, $I_D = 3.5\text{A}$) *		$R_{DS(on)}$			1.2	Ω
Forward Transconductance ($V_{DS} = 15\text{ V}$, $I_D = 3.0\text{A}$) *		g_{FS}	3.4			mhos
Input Capacitance	$(V_{DS} = 25\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$)	C_{iss}		1498	2100	pF
Output Capacitance		C_{oss}		158	220	pF
Reverse Transfer Capacitance		C_{rss}		29	60	pF
Turn-On Delay Time	$(V_{DD} = 300\text{ V}$, $I_D = 6.0\text{ A}$, $V_{GS} = 10\text{ V}$, $R_G = 9.1\Omega$) *	$t_{d(on)}$		14	30	ns
Rise Time		t_r		19	40	ns
Turn-Off Delay Time		$t_{d(off)}$		40	80	ns
Fall Time		t_f		26	55	ns
Total Gate Charge	$(V_{DS} = 300\text{ V}$, $I_D = 6.0\text{ A}$, $V_{GS} = 10\text{ V}$) *	Q_g		35.5	50	nC
Gate-Source Charge		Q_{gs}		8.1		nC
Gate-Drain Charge		Q_{gd}		14.1		nC
Internal Drain Inductance (Measured from the drain lead 0.25" from package to center of die)		L_D		4.5		nH
Internal Drain Inductance (Measured from the source lead 0.25" from package to source bond pad)		L_S		7.5		nH
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On-Voltage(1)	$(I_S = 6.0\text{ A}$, $dI_S/dt = 100\text{A}/\mu\text{s}$)	V_{SD}		0.83	1.2	V
Forward Turn-On Time		t_{on}		**		ns
Reverse Recovery Time		t_{rr}		266		ns

* Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$

** Negligible, Dominated by circuit inductance

TYPICAL ELECTRICAL CHARACTERISTICS

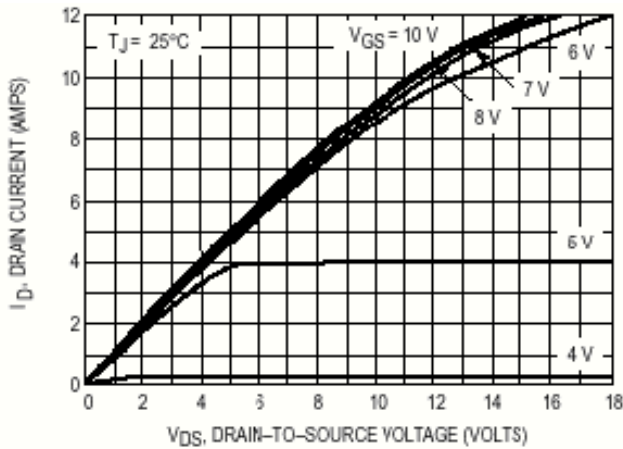


Figure 1. On-Region Characteristics

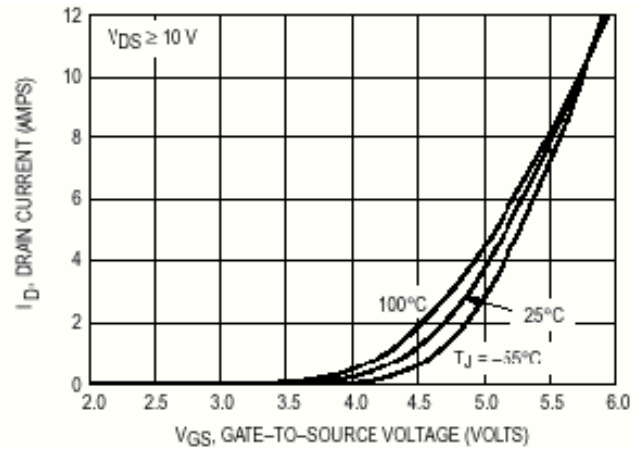


Figure 2. Transfer Characteristics

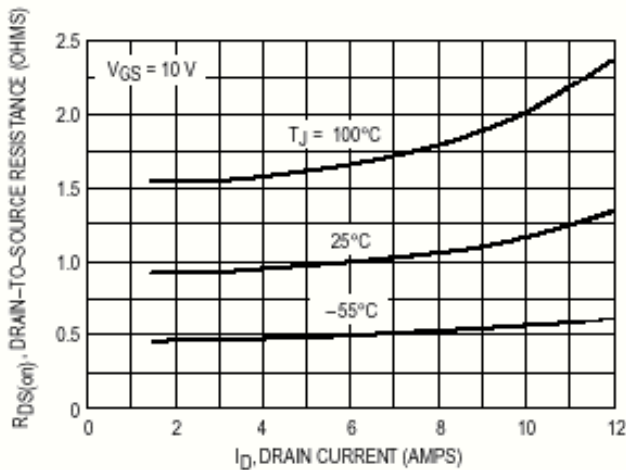


Figure 3. On-Resistance versus Drain Current and Temperature

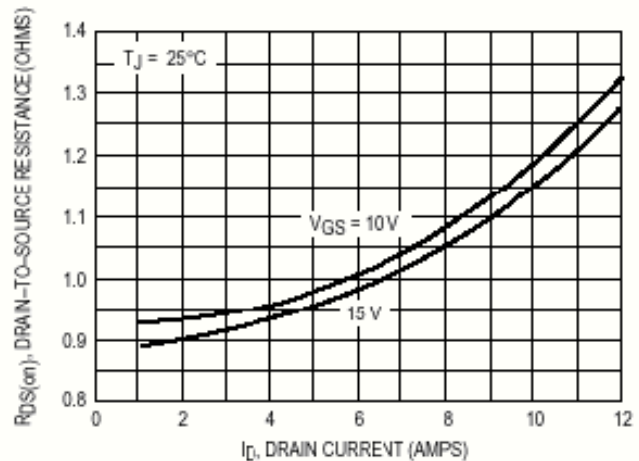


Figure 4. On-Resistance versus Drain Current and Gate Voltage

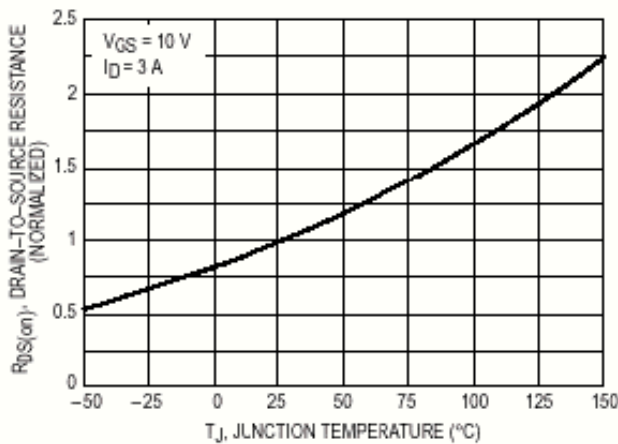


Figure 5. Cn-Resistance Variation with Temperature

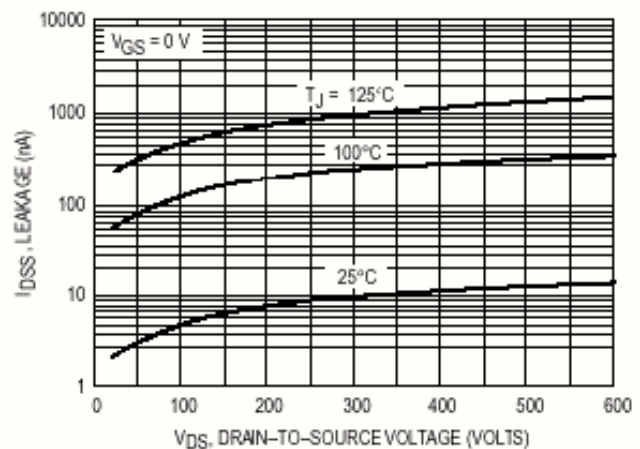
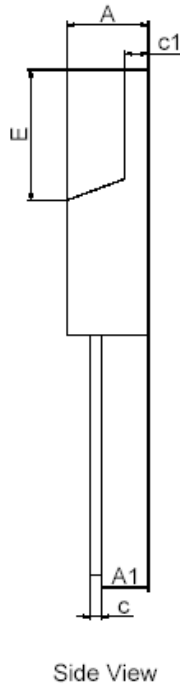
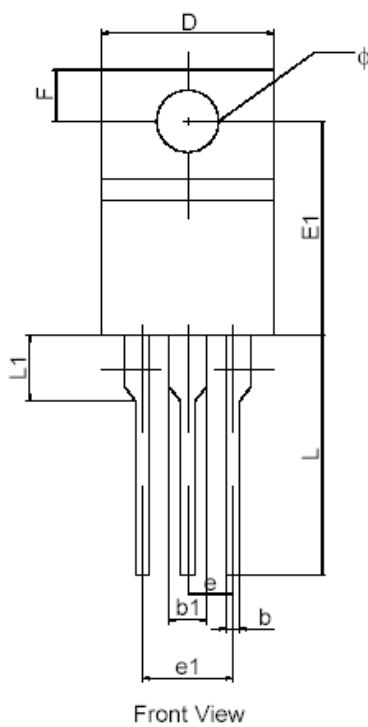


Figure 6. Drain-To-Source Leakage Current versus Voltage

PACKAGE DIMENSION

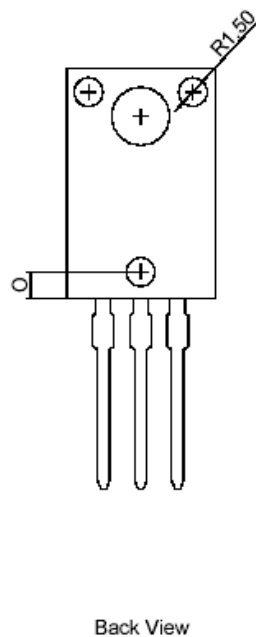
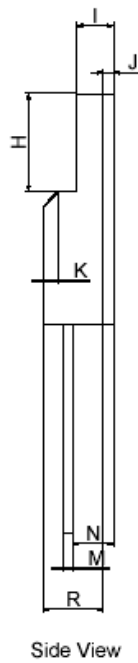
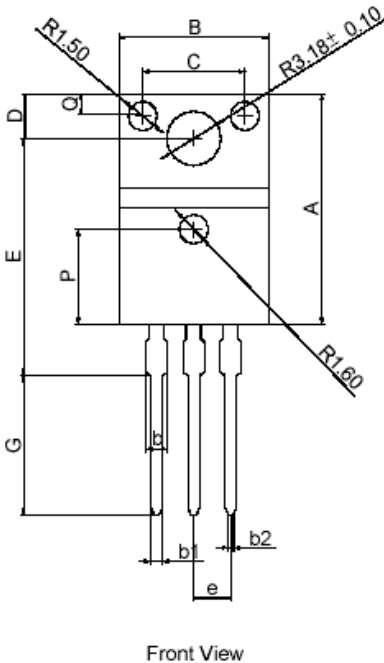
TO-220



PIN 1: GATE
PIN 2: DRAIN
PIN 3: SOURCE

SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	4.47	---	4.67	0.176	---	0.184
A1	8.02	---	8.02	0.069	---	0.311
b	0.71	---	0.81	0.028	---	0.032
b1	1.17	---	1.27	0.046	---	0.051
c	0.31	---	0.53	0.012	---	0.021
c1	1.17	---	1.27	0.046	---	0.051
D	10.01	---	10.31	0.394	---	0.408
E	8.60	---	8.60	0.338	---	0.350
E1	12.06	---	12.46	0.475	---	0.491
e	---	2.54	---	---	0.100	---
e1	4.50	---	5.18	0.198	---	0.204
F	2.60	---	2.80	0.102	---	0.111
L	13.40	---	13.80	0.528	---	0.543
L1	3.68	---	3.88	0.145	---	0.153
φ	3.70	---	3.80	0.146	---	0.150

TO-220FP



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	16.87	---	18.27	0.664	---	0.720
B	9.95	---	10.26	0.392	---	0.408
C	---	7.00	---	---	0.276	---
D	3.80	---	3.40	0.150	---	0.134
E	15.00	---	15.00	0.591	---	0.591
G	9.45	---	10.00	0.372	---	0.394
H	6.45	---	6.51	0.254	---	0.257
I	2.54	---	2.74	0.100	---	0.108
J	---	0.70	---	---	0.028	---
K	---	1.00	---	---	0.039	---
M	0.45	---	0.60	0.018	---	0.024
N	2.60	---	2.60	0.102	---	0.102
O	---	1.80	---	---	0.071	---
P	---	0.50	---	---	0.020	---
Q	---	1.80	---	---	0.071	---
R	4.50	---	4.30	0.177	---	0.169
b	---	1.27	---	---	0.050	---
b1	0.70	---	0.90	0.028	---	0.035
b2	0.25	---	0.45	0.010	---	0.018
e	---	2.54	---	---	0.100	---

How to reach us :
Hong Kong Headquarter :Unit C, 11/F, Wing Hang Insurance Building 11 Wing Kut Street, Central, Hong Kong
Shenzhen Office :Room 4A008, 4/F, Sun Asia Electronic City, Zhonghang Road ,Shenzhen, China.

e-mail: info@funart.com.hk
 Tel: (852) 25950393
 Fax: (852) 25588160
 Tel: (86) 755 6130 6688
 Fax: (86) 755 6130 6667

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