

FEATURES

- ☐ Originative New Design
- ☐ 100% EAS Test
- ☐ Rugged Gate Oxide Technology
- ☐ Extremely Low Intrinsic Capacitances
- ☐ Remarkable Switching Characteristics
- ☐ Unequalled Gate Charge : 17 nC (Typ.)
- ☐ Extended Safe Operating Area
- ☐ Lower $R_{DS(ON)}$: 6.2 Ω (Typ.) @ $V_{GS}=10V$
- ☐ Halogen Free

APPLICATION

- ☐ Low power battery chargers
- ☐ Switch mode power supply (SMPS)
- ☐ AC adaptors

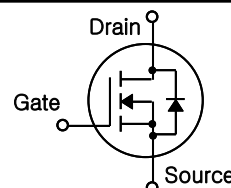
PFU2N100G

1000V N-Channel MOSFET

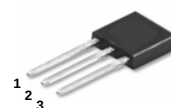
$BV_{DSS} = 1000 V$

$R_{DS(on)} = 6.2 \Omega$

$I_D = 1.9 A$



I-PAK(TO-251)



1.Gate 2. Drain 3. Source

Absolute Maximum Ratings $T_C=25^\circ C$ unless otherwise specified

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source Voltage	1000	V
I_D	Drain Current – Continuous ($T_C = 25^\circ C$)	1.9	A
	Drain Current – Continuous ($T_C = 100^\circ C$)	1.2	A
I_{DM}	Drain Current – Pulsed (Note 1)	7.5	A
V_{GS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	35	mJ
I_{AR}	Avalanche Current (Note 1)	1.9	A
E_{AR}	Repetitive Avalanche Energy (Note 1)	6.25	mJ
dv/dt	Peak Diode Recovery dv/dt (Note 3)	4.5	V/ns
P_D	Total Power Dissipation ($T_A=25^\circ C$) *	2.0	W
	Power Dissipation ($T_C = 25^\circ C$)	62.5	W
	– Derate above $25^\circ C$	0.5	W/ $^\circ C$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ C$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	$^\circ C$

Thermal Resistance Characteristics

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	2.0	$^\circ C / W$
$R_{\theta JA}$	Junction-to-Ambient*	--	62	
$R_{\theta JA}$	Junction-to-Ambient	--	110	

* When mounted on the minimum pad size recommended (PCB Mount)

Electrical Characteristics $T_C=25\text{ }^{\circ}\text{C}$ unless otherwise specified

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
On Characteristics						
V_{GS}	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	3.0	--	5.0	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}$, $I_D = 1.0\text{ A}$	--	6.2	7.5	Ω

Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	1000	--	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C	--	0.9	--	$\text{V}/^{\circ}\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 1000\text{ V}$, $V_{GS} = 0\text{ V}$	--	--	10	μA
		$V_{DS} = 800\text{ V}$, $T_C = 125^{\circ}\text{C}$	--	--	100	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 30\text{ V}$, $V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -30\text{ V}$, $V_{DS} = 0\text{ V}$	--	--	-100	nA

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 25\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$	--	720	1000	pF
C_{oss}	Output Capacitance		--	55	80	pF
C_{rss}	Reverse Transfer Capacitance		--	6	9	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Time	$V_{DS} = 500\text{ V}$, $I_D = 2.0\text{ A}$, $R_G = 25\text{ }\Omega$ (Note 4,5)	--	20	40	ns
t_r	Turn-On Rise Time		--	50	100	ns
$t_{d(off)}$	Turn-Off Delay Time		--	40	80	ns
t_f	Turn-Off Fall Time		--	20	40	ns
Q_g	Total Gate Charge	$V_{DS} = 800\text{ V}$, $I_D = 2.0\text{ A}$, $V_{GS} = 10\text{ V}$ (Note 4,5)	--	17	25	nC
Q_{gs}	Gate-Source Charge		--	4.7	--	nC
Q_{gd}	Gate-Drain Charge		--	7.8	--	nC

Source-Drain Diode Maximum Ratings and Characteristics

I_S	Continuous Source-Drain Diode Forward Current		--	--	1.9	A
I_{SM}	Pulsed Source-Drain Diode Forward Current		--	--	7.5	
V_{SD}	Source-Drain Diode Forward Voltage	$I_S = 2.0\text{ A}, V_{GS} = 0\text{ V}$	--	--	1.5	V

Notes ;

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $I_{AS}=2.0\text{ A}$, $V_{DD}=50\text{ V}$, $R_G=25\text{ }\Omega$, Starting $T_J=25^{\circ}\text{C}$
3. $I_{SD}\leq 2.0\text{ A}$, $di/dt\leq 300\text{ A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$
4. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature

Typical Characteristics

Figure1. On Region Characteristics

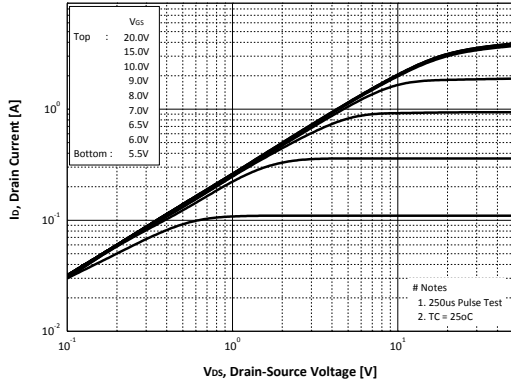


Figure 2. Transfer Characteristics

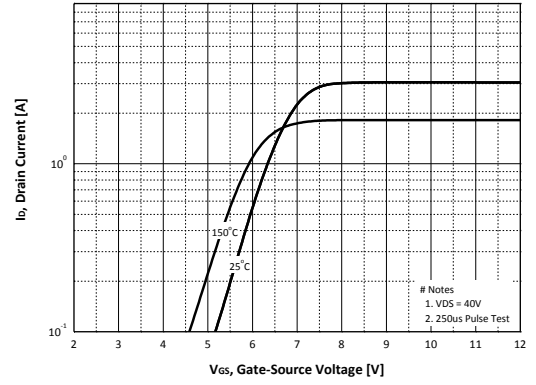


Figure 3. Static Drain-Source On Resistance

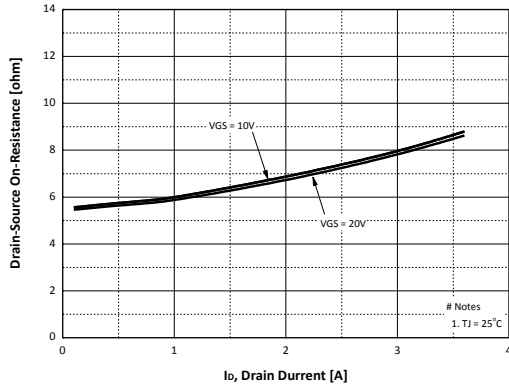


Figure 4. Body Diode Forward Voltage

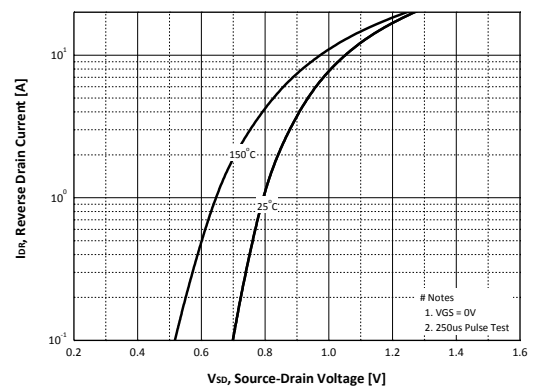


Figure 5. Capacitance Characteristics

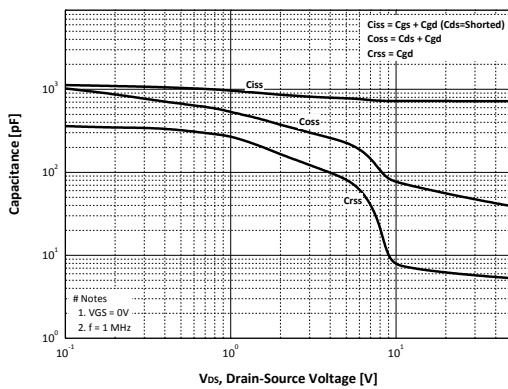
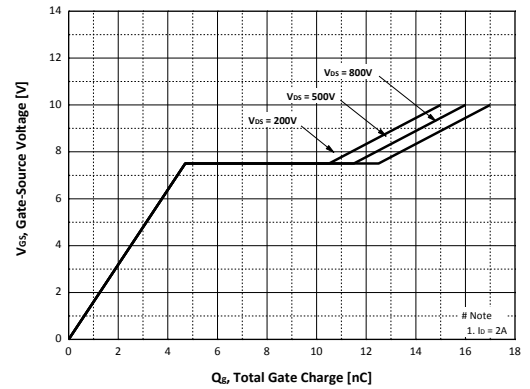


Figure 6. Gate Charge Characteristics



Typical Characteristics

Figure 7. Breakdown Voltage Variation vs. Temperature

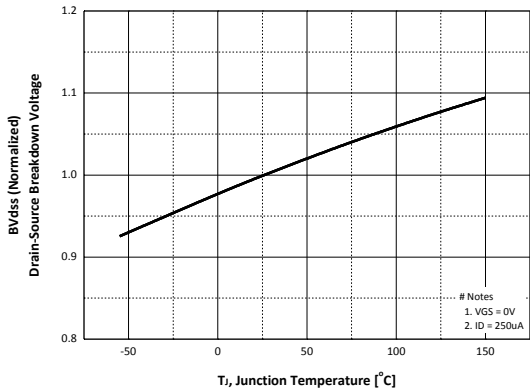


Figure 8. On-Resistance Variation vs. Temperature

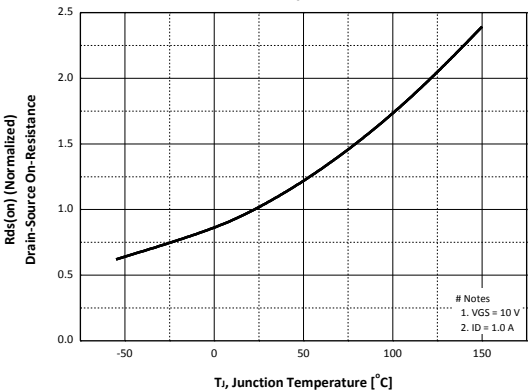


Figure 9. Safe Operation Area

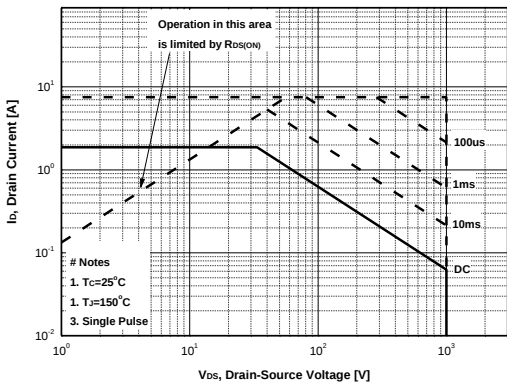


Figure 10. Maximum Drain Current vs. Case Temperature

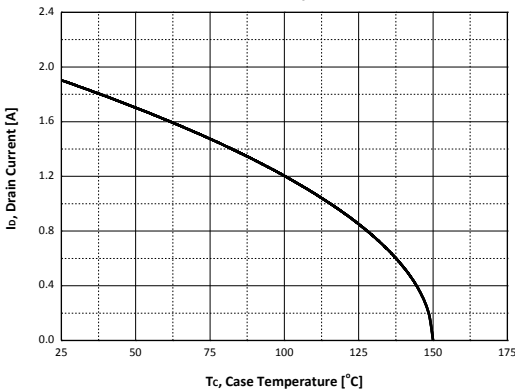
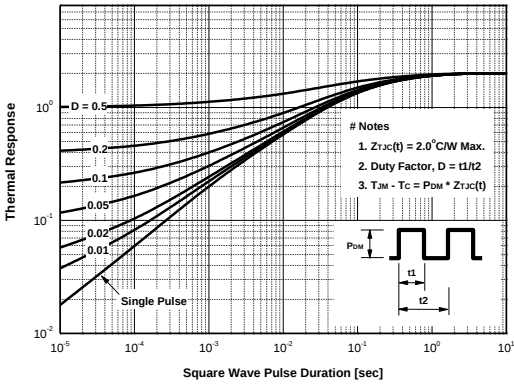


Figure 11. Transient Thermal Response Curve



Characteristics Test Circuit & Waveform

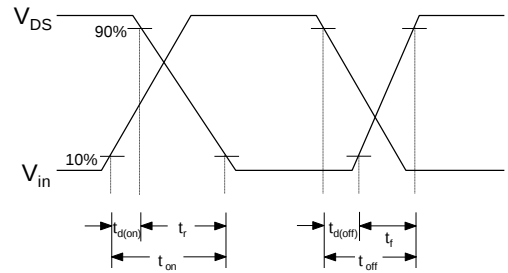
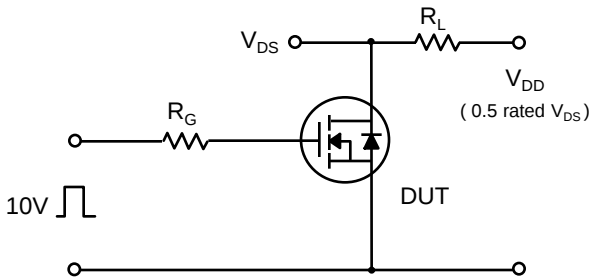


Fig 14. Resistive Switching Test Circuit & Waveforms

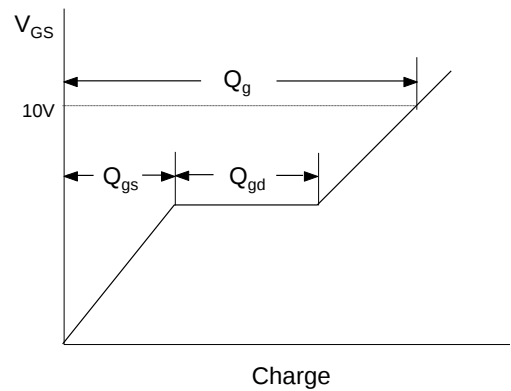
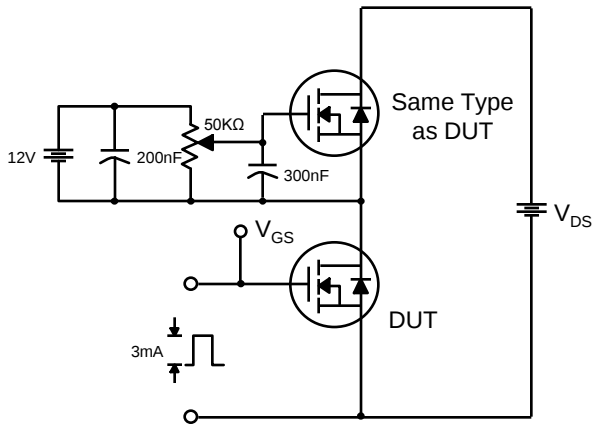


Fig 15. Gate Charge Test Circuit & Waveform

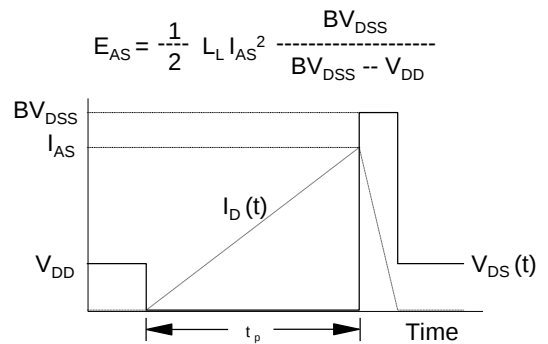
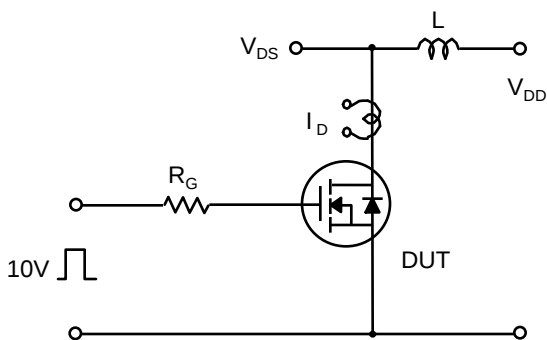


Fig 16. Unclamped Inductive Switching Test Circuit & Waveforms

Characteristics Test Circuit & Waveform (continued)

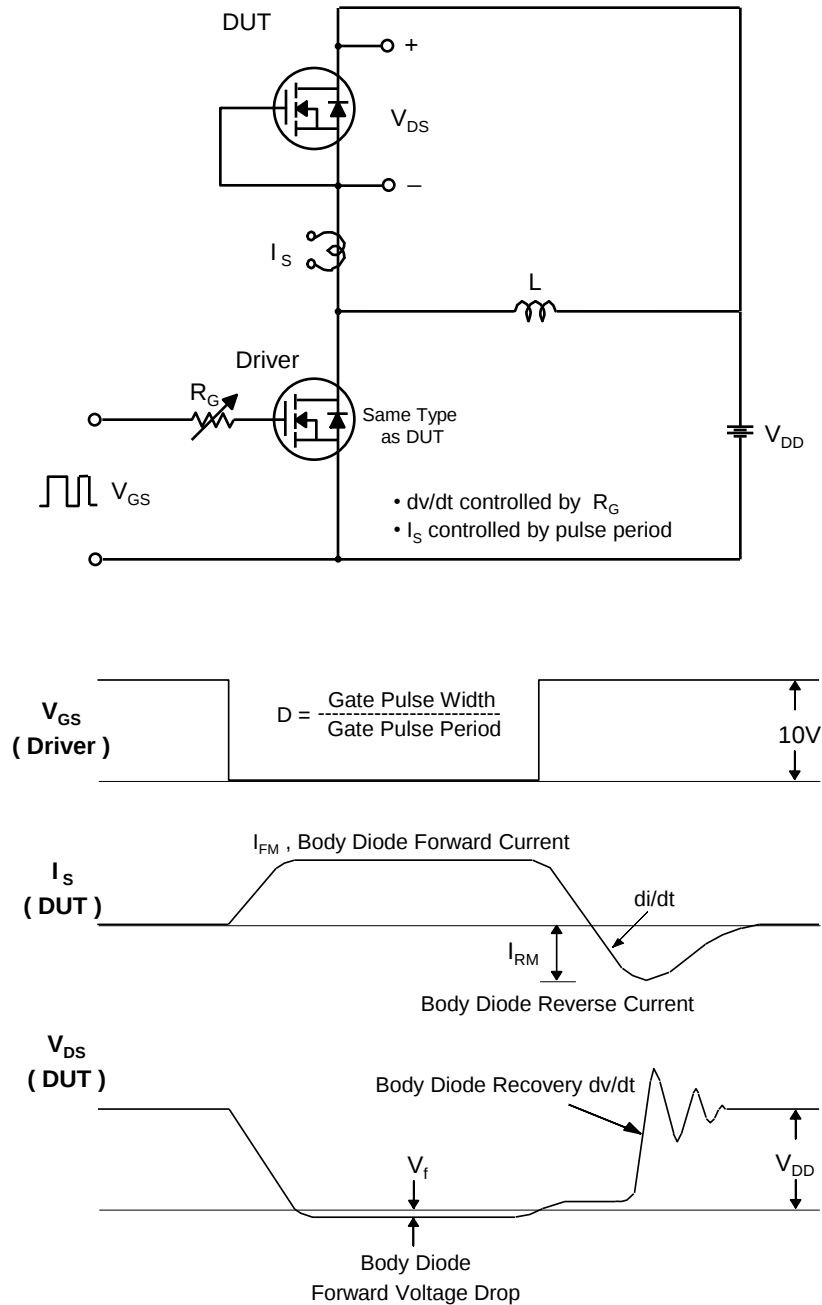


Fig 17. Peak Diode Recovery dv/dt Test Circuit & Waveforms

Package Dimension

I-PAK(TO-251)

Symbol	Millimeters
A	6.40 ~ 6.60
A1	5.30 ~ 5.50
B	5.40 ~ 5.70
C	1.35 ~ 1.65
D	7.40 ~ 8.00
D1	0.60 ~ 0.75
D2	2.30
D3	0.49 ~ 0.59
D4	1.72 ~ 1.82
E	2.20 ~ 2.40
F	0.55 ~ 0.65
a1	5 deg
a2	5 deg
a3	2 deg

