

FEATURES

- ☐ Originative New Design
- ☐ 100% EAS Test
- ☐ Rugged Gate Oxide Technology
- ☐ Extremely Low Intrinsic Capacitances
- ☐ Remarkable Switching Characteristics
- ☐ Unequalled Gate Charge : 22.2 nC (Typ.)
- ☐ Extended Safe Operating Area
- ☐ Lower $R_{DS(on)}$: 2.4 Ω (Typ.) @ $V_{GS}=10V$
- ☐ Halogen Free

APPLICATION

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

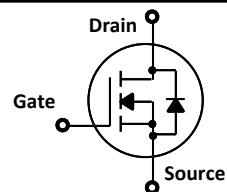
PFU6N80G

800V N-Channel MOSFET

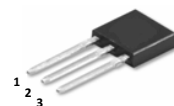
$$BV_{DSS} = 800 V$$

$$R_{DS(on)} = 2.4 \Omega$$

$$I_D = 4.5 A$$



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	800	V
I_D	Drain Current – Continuous ($T_C = 25^\circ C$)	4.5	A
	Drain Current – Continuous ($T_C = 100^\circ C$)	2.9	A
I_{DM}	Drain Current – Pulsed (Note 1)	18	A
V_{GS}	Gate-Source Voltage	± 30	V
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	600	mJ
I_{AR}	Avalanche Current (Note 1)	4.5	A
E_{AR}	Repetitive Avalanche Energy (Note 1)	12.5	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 ($T_C = 25^\circ C$)	125	W
	- Derate above $25^\circ C$	1.0	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	--	1.0	$^\circ C/W$
$R_{\theta JA}$	Junction-to-Ambient*	--	62	
$R_{\theta JA}$	Junction-to-Ambient	--	110	

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

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
On Characteristics						
V_{GS}	Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	2.5	--	4.5	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}$, $I_D = 3.0\text{ A}$	--	2.4	3.0	Ω

Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	800	--	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C	--	0.56	--	$\text{V}/^{\circ}\text{C}$
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 800\text{ V}$, $V_{GS} = 0\text{ V}$	--	--	10	μA
		$V_{DS} = 640\text{ V}$, $T_C = 125^{\circ}\text{C}$	--	--	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	$V_{DS} = 25\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1.0\text{ MHz}$	--	1175	1530	pF
C_{oss}	Output Capacitance		--	76	100	pF
C_{rss}	Reverse Transfer Capacitance		--	22	30	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Time	$V_{DS} = 400\text{ V}$, $I_D = 6.0\text{ A}$, $R_G = 25\text{ }\Omega$, $R_L = 67\text{ }\Omega$ (Note 4,5)	--	26	55	ns
t_r	Turn-On Rise Time		--	18	40	ns
$t_{d(off)}$	Turn-Off Delay Time		--	53	110	ns
t_f	Turn-Off Fall Time		--	28	60	ns
Q_g	Total Gate Charge	$V_{DS} = 640\text{ V}$, $I_D = 6.0\text{ A}$, $V_{GS} = 10\text{ V}$ (Note 4,5)	--	22.2	33	nC
Q_{gs}	Gate-Source Charge		--	8.5	--	nC
Q_{gd}	Gate-Drain Charge		--	4.2	--	nC

Source-Drain Diode Maximum Ratings and Characteristics

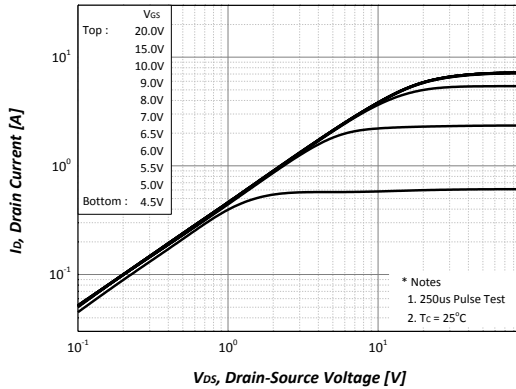
I_S	Continuous Source-Drain Diode Forward Current		--	--	4.5	A
I_{SM}	Pulsed Source-Drain Diode Forward Current		--	--	18	
V_{SD}	Source-Drain Diode Forward Voltage	$I_S = 6.0\text{ A}$, $V_{GS} = 0\text{ V}$	--	--	1.5	V
t_{rr}	Reverse Recovery Time	$I_S = 6.0\text{ A}$, $V_{GS} = 0\text{ V}$ $di_F/dt = 100\text{ A}/\mu\text{s}$ (Note 4)	--	530	--	ns
Q_{rr}	Reverse Recovery Charge		--	4.3	--	μC

Notes ;

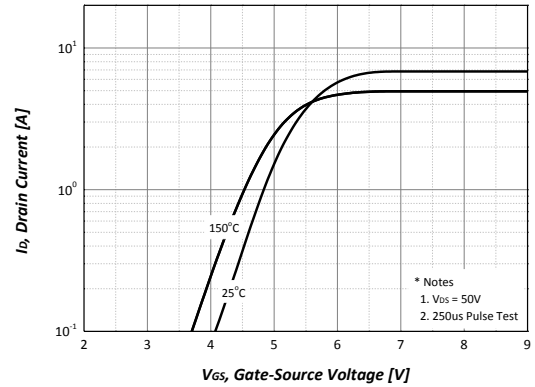
1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $I_{AS}=6.0\text{ A}$, $V_{DD}=50\text{ V}$, $R_G=25\text{ }\Omega$, Starting $T_J=25^{\circ}\text{C}$
3. $I_{SD}\leq 6.0\text{ A}$, $di/dt\leq 300\text{ A}/\mu\text{s}$, $V_{DD}\leq BV_{DSS}$, Starting $T_J=25^{\circ}\text{C}$
4. Pulse Test : Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature

Typical Characteristics

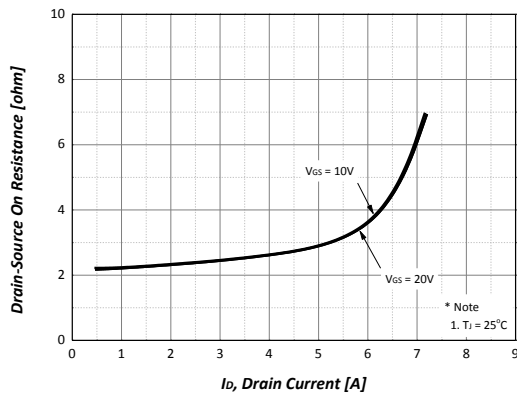
On Region Characteristics



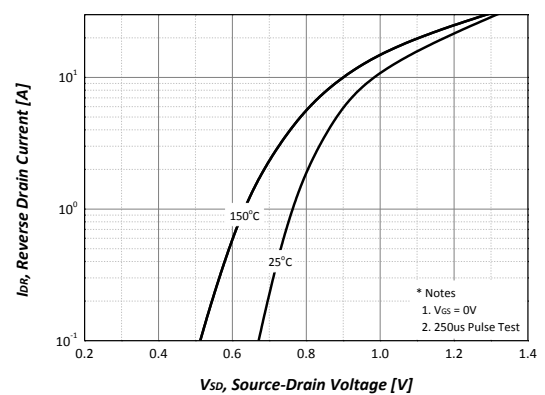
Transfer Characteristics



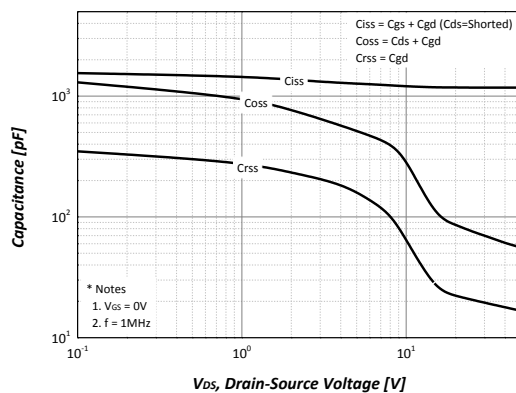
Static Drain-Source On Resistance



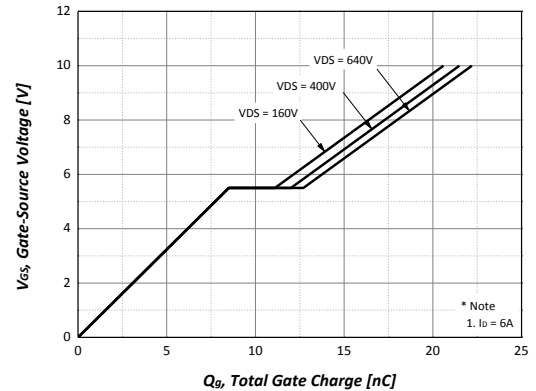
Body Diode Forward Voltage



Capacitance Characteristics

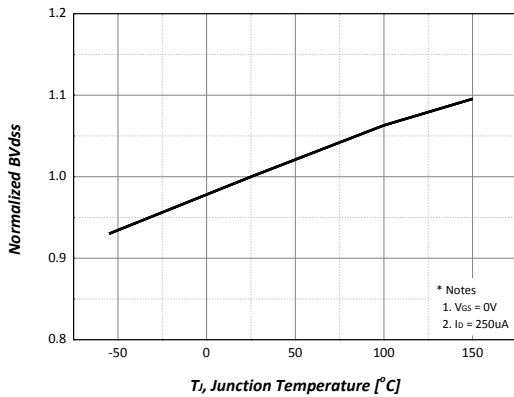


Gate Charge Characteristics

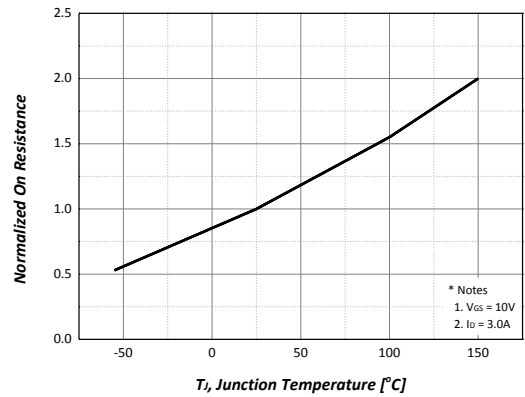


Typical Characteristics

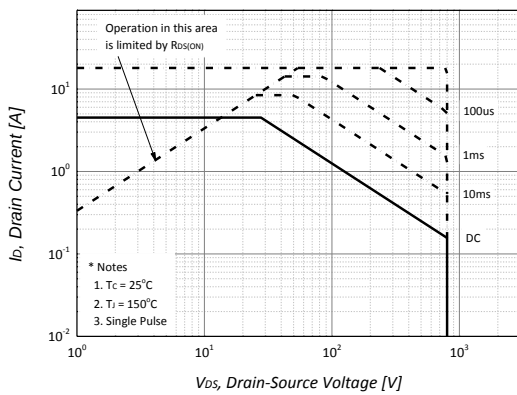
BVdss Variation vs. Temperature



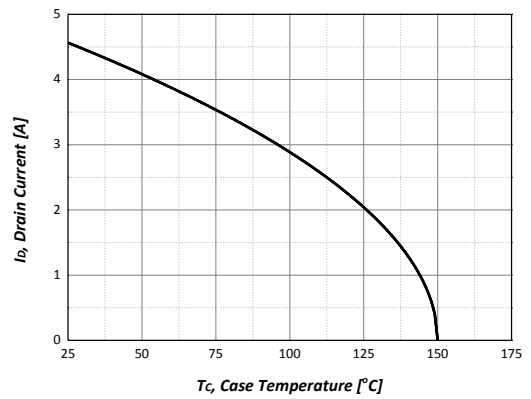
On Resistance Variation vs. Temperature



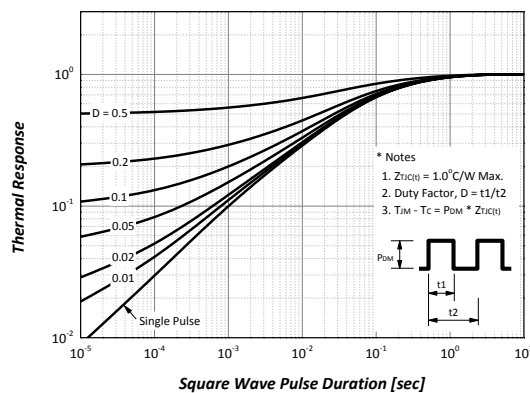
Safe Operation Area



Maximum Drain Current vs. Case Temperature



Transient Thermal Response Curve



Characteristics Test Circuit & Waveform

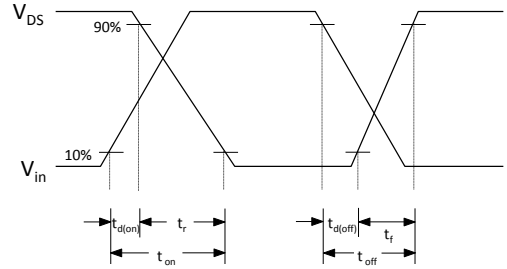
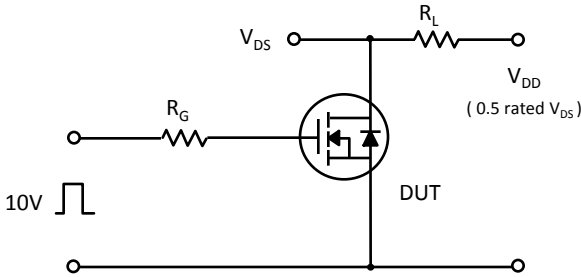


Fig 14. Resistive Switching Test Circuit & Waveforms

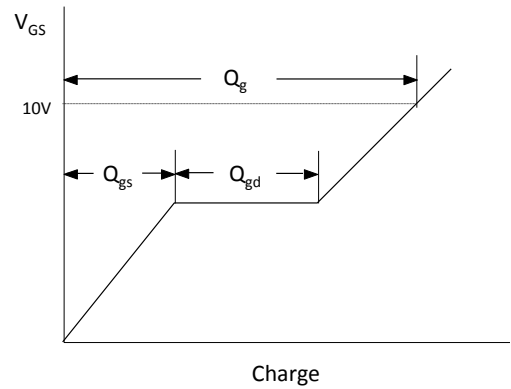
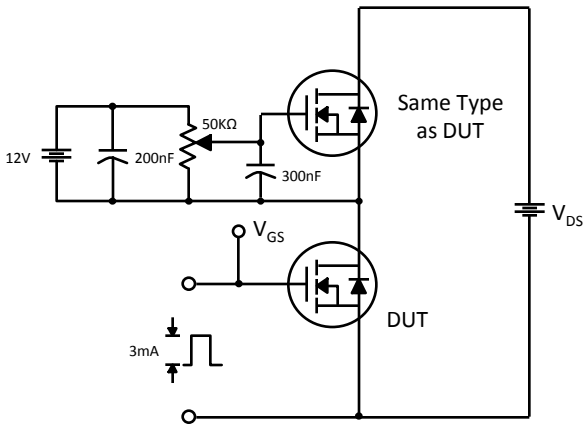


Fig 15. Gate Charge Test Circuit & Waveform

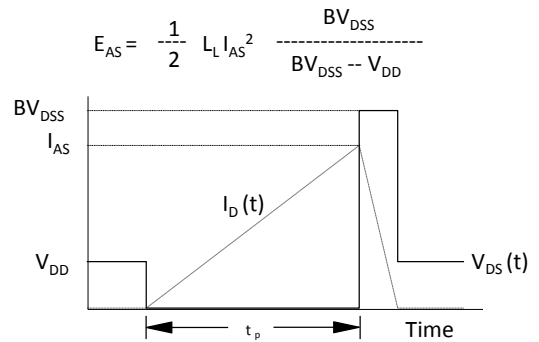
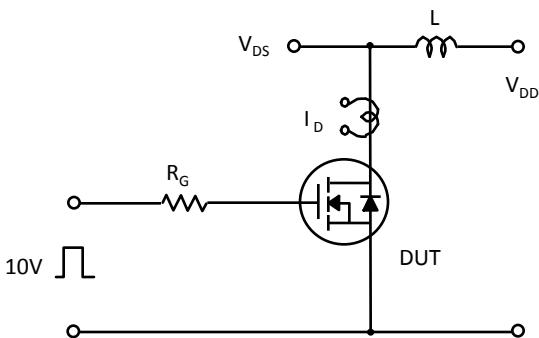


Fig 16. Unclamped Inductive Switching Test Circuit & Waveforms

Characteristics Test Circuit & Waveform (continued)

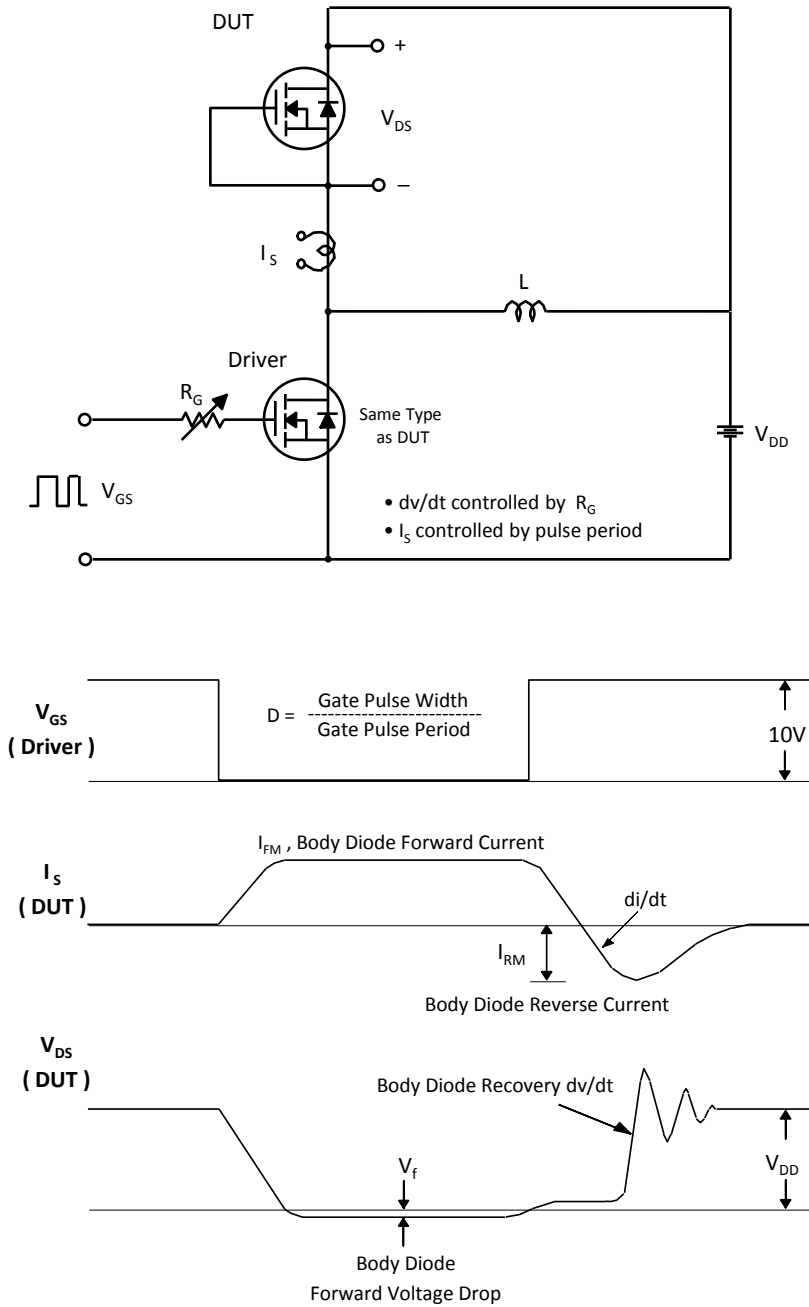


Fig 17. Peak Diode Recovery dv/dt Test Circuit & Waveforms