

N-Channel 68V(D-S) MOSFET

Product summary		
V_{DS}	68	V
$R_{DS(ON)}$ (at $V_{GS}=10V$) Typ.	6.5	m Ω
$I_D(T_C=25^{\circ}C)$	80	A

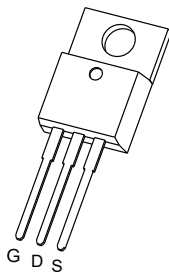
Features

- High density cell design for low $R_{DS(ON)}$
- Fast switching

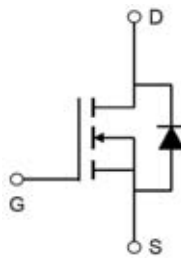
Applications

- PWM Application
- Load switching

Pin Configuration



TO-220



Packing Information

Device	Package	Packing Method	Quantity(Min. Package)
ECFB80N07	TO-220	Tube	1000pcs

Absolute Maximum Ratings (at $T_A=25^{\circ}C$ Unless Otherwise Noted)

Symbol	Parameter		Rating	Units
V_{DS}	Drain-Source Voltage		68	V
V_{GS}	Gate-Source Voltage		± 25	V
I_D	Continuous Drain Current	$T_C=25^{\circ}C$	80	A
		$T_C=100^{\circ}C$	51	A
I_{DM}	Pulse Drain Current Tested ^A		320	A
E_{AS}	Single Pulse Avalanche Energy ^B		260	mJ
P_D	Power Dissipation	$T_C=25^{\circ}C$	156	W
T_J, T_{STG}	Junction and Storage Temperature Range		-55 to +150	$^{\circ}C$

Thermal Characteristics

Symbol	Parameter	Typical	Units
$R_{\theta JC}$	Thermal Resistance-Junction to case	0.8	$^{\circ}C/W$

Electrical Characteristics (at $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Condition	Min.	Typ.	Max.	Units
Static Parameters						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	68	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=68V, V_{GS}=0V$	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 25V$	--	--	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.0	4.0	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ^C	$V_{GS}=10V, I_D=20A$	--	6.5	8.5	m Ω
V_{SD}	Forward Voltage	$I_S=20A, V_{GS}=0V$	--	--	1.2	V
I_S	Maximum Body-Diode Continuous Current		--	--	80	A
Dynamic Parameters ^D						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=35V$ $f=1\text{MHz}$	--	5800	--	pF
C_{oss}	Output Capacitance		--	220	--	pF
C_{rss}	Reverse Transfer Capacitance		--	210	--	pF
Q_g	Total Gate Charge	$V_{DS}=60V, I_D=40A$ $V_{GS}=10V$	--	92	--	nC
Q_{gs}	Gate-Source Charge		--	23	--	nC
Q_{gd}	Gate-Drain Charge		--	35	--	nC
$t_{D(on)}$	Turn-on Delay Time	$V_{DS}=35V, I_D=40A,$ $R_L=3\Omega,$ $V_{GS}=10V$	--	23	--	ns
t_r	Turn-on Rise Time		--	22	--	ns
$t_{D(off)}$	Turn-off Delay Time		--	46	--	ns
t_f	Turn-off Fall Time		--	9	--	ns

A. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

B. EAS condition: $T_J=25^\circ\text{C}$, $V_{DD}=50V$, $V_G=10V$, $L=0.5\text{mH}$.

C. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

D. Guaranteed by design, not subject to production testing.

Typical Characteristics

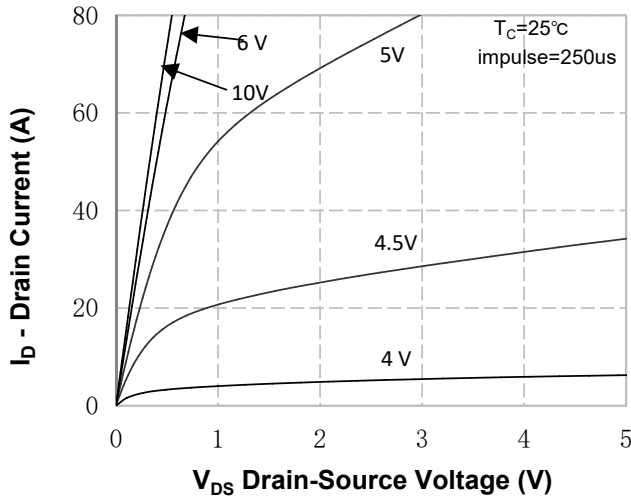


Figure 1. On-Region Characteristics

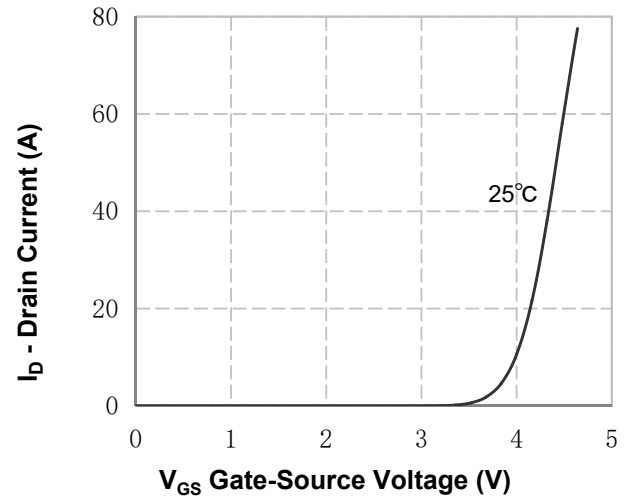


Figure 2. Transfer Characteristics

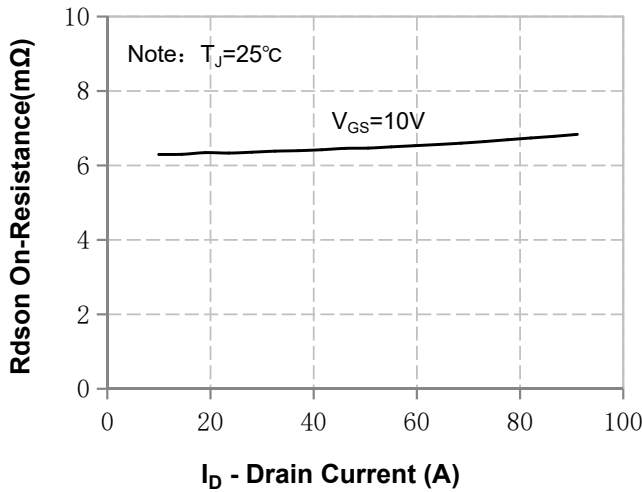


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

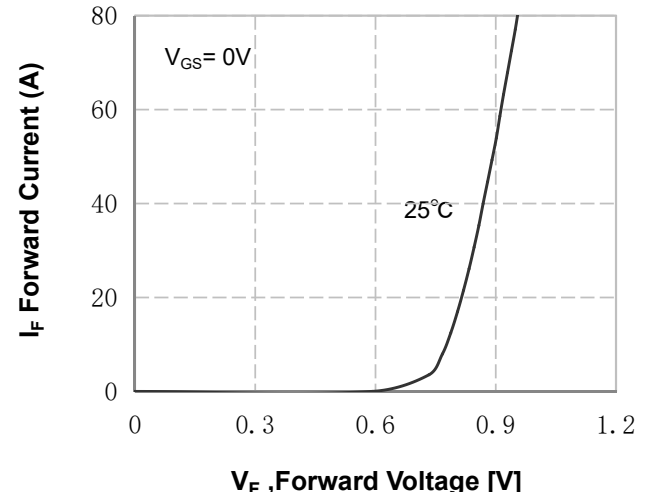


Figure 4. Body Diode Forward Voltage Variation vs Source Current

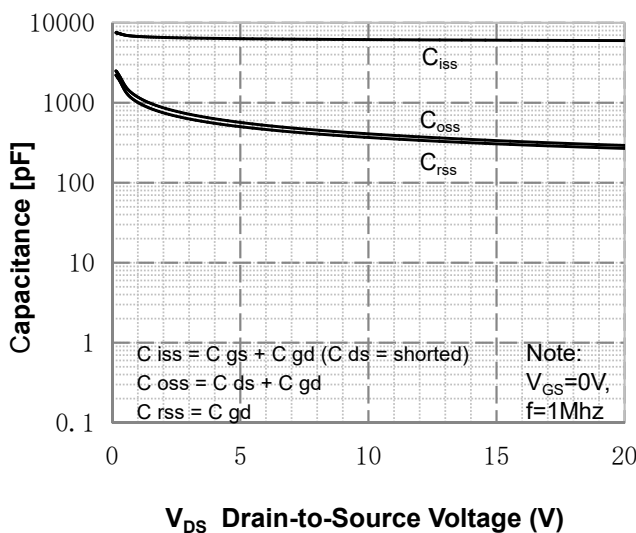


Figure 5. Capacitance Characteristics

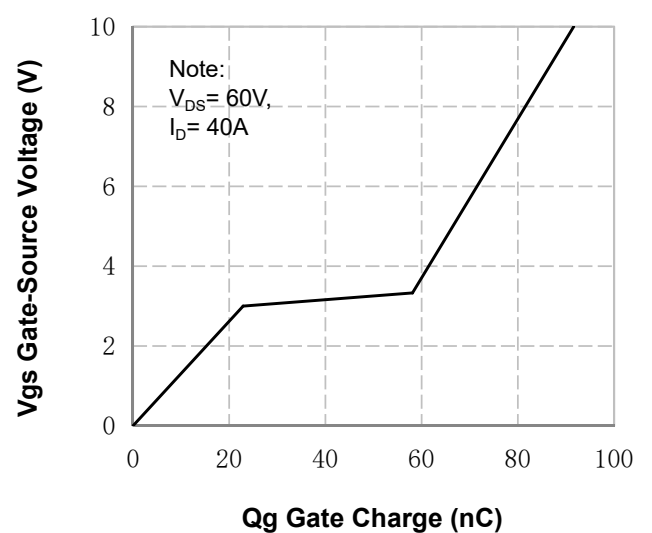


Figure 6. Gate Charge Characteristics

Typical Characteristics

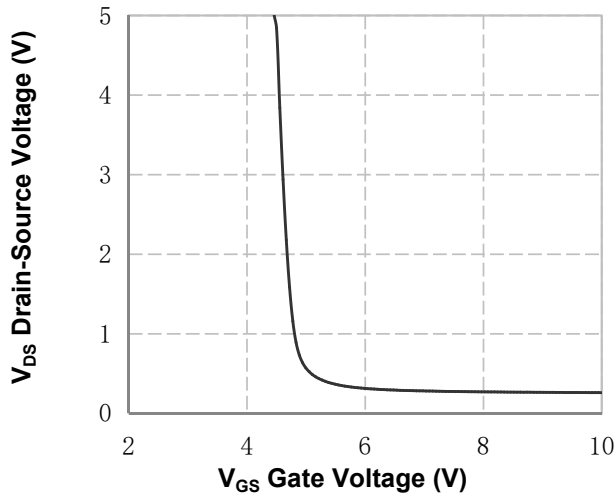


Figure 7. Vds Drain-Source Voltage vs Gate Voltage

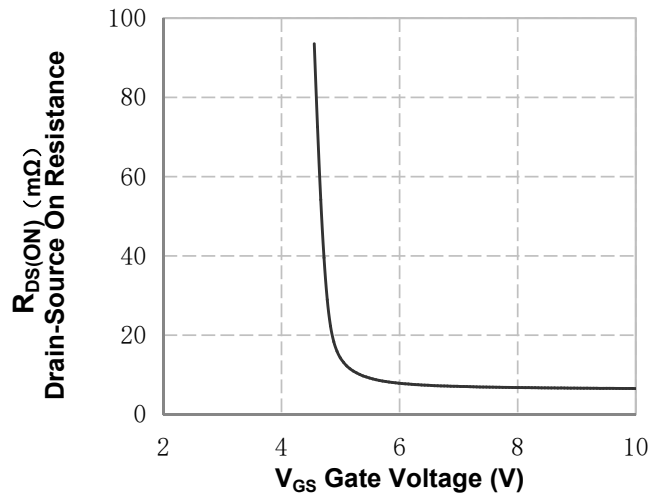


Figure 8. On-Resistance vs Gate Voltage

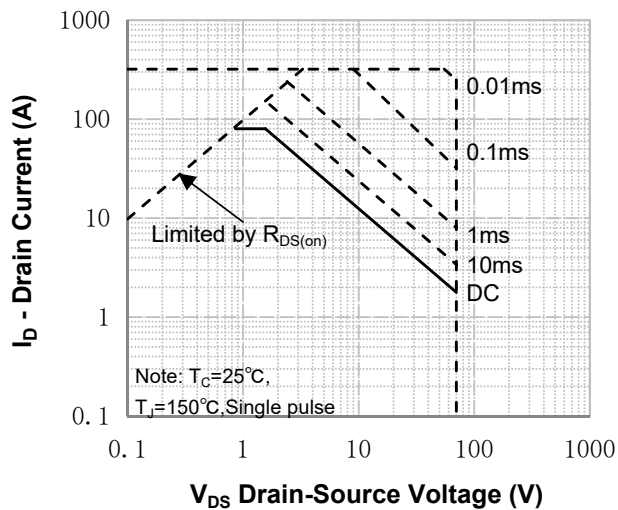


Figure 9. Maximum Safe Operating Area

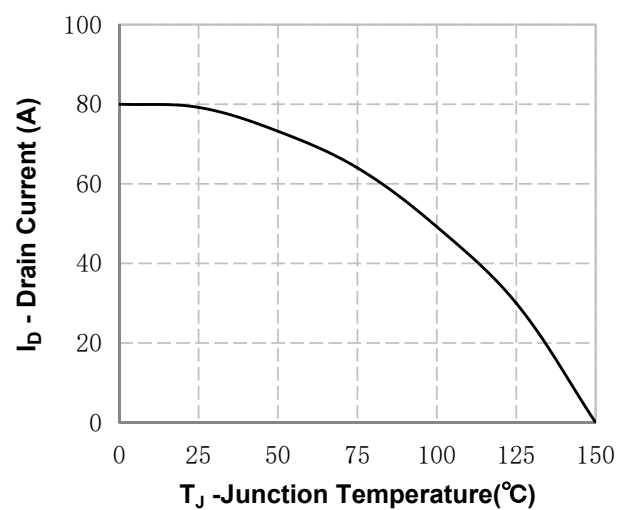


Figure 10. Maximum Continuous Drain Current vs Temperature

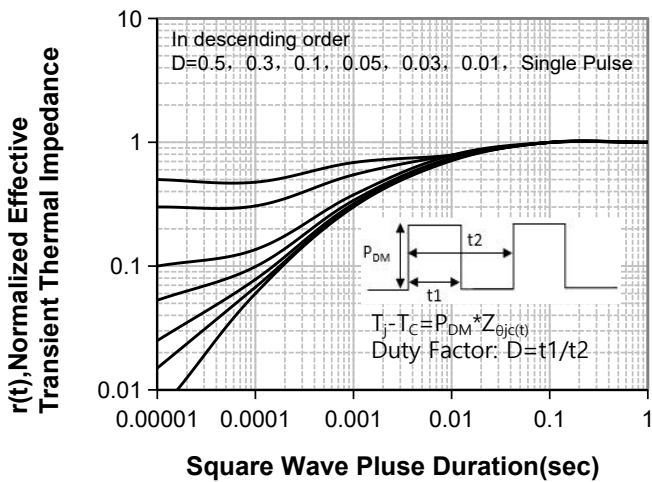
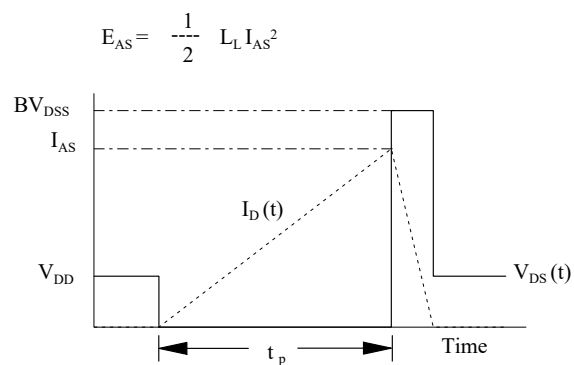
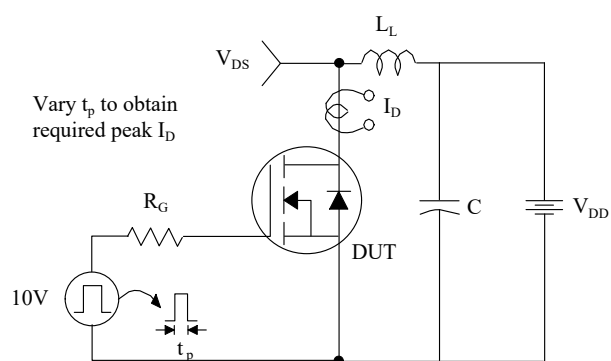
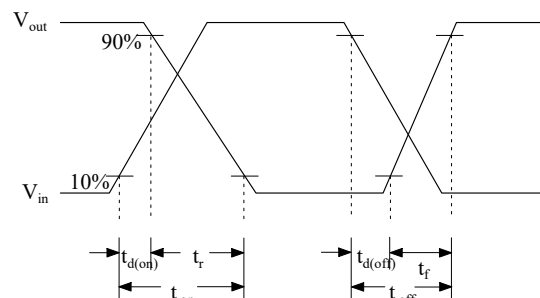
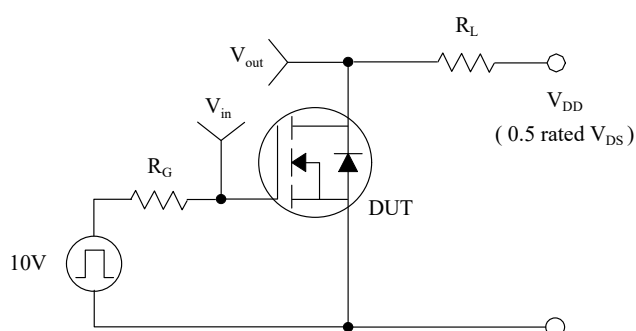
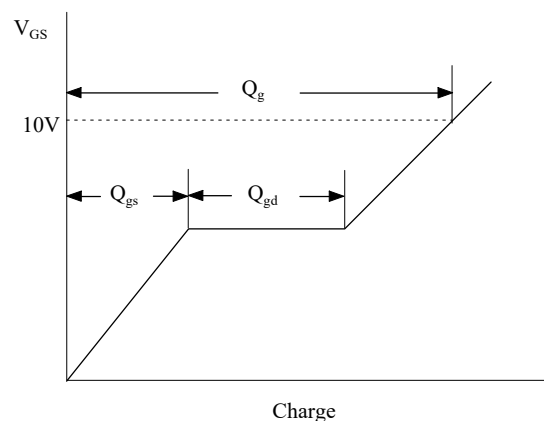


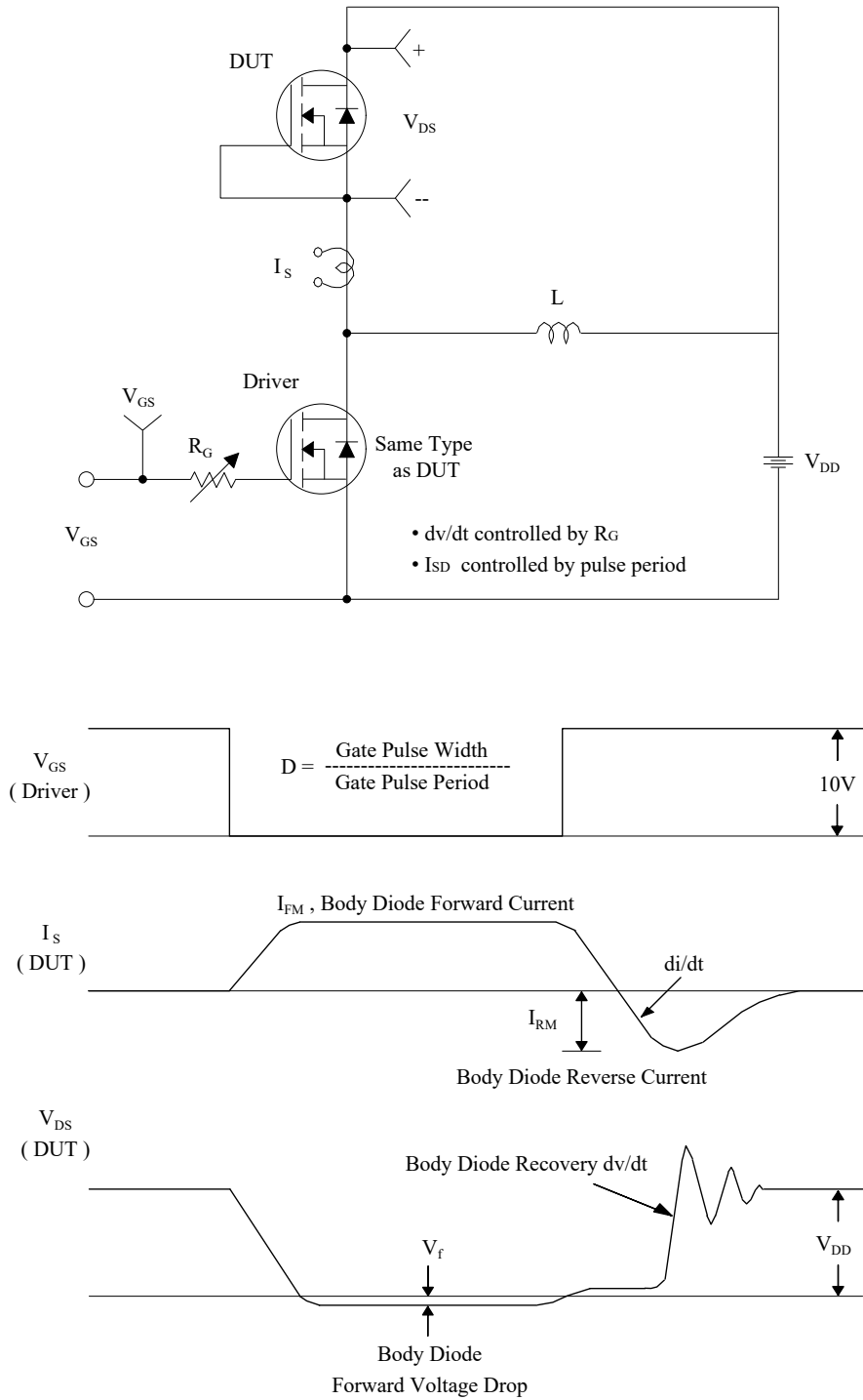
Figure 11. Transient Thermal Response Curve

Gate Charge Test Circuit & Waveform

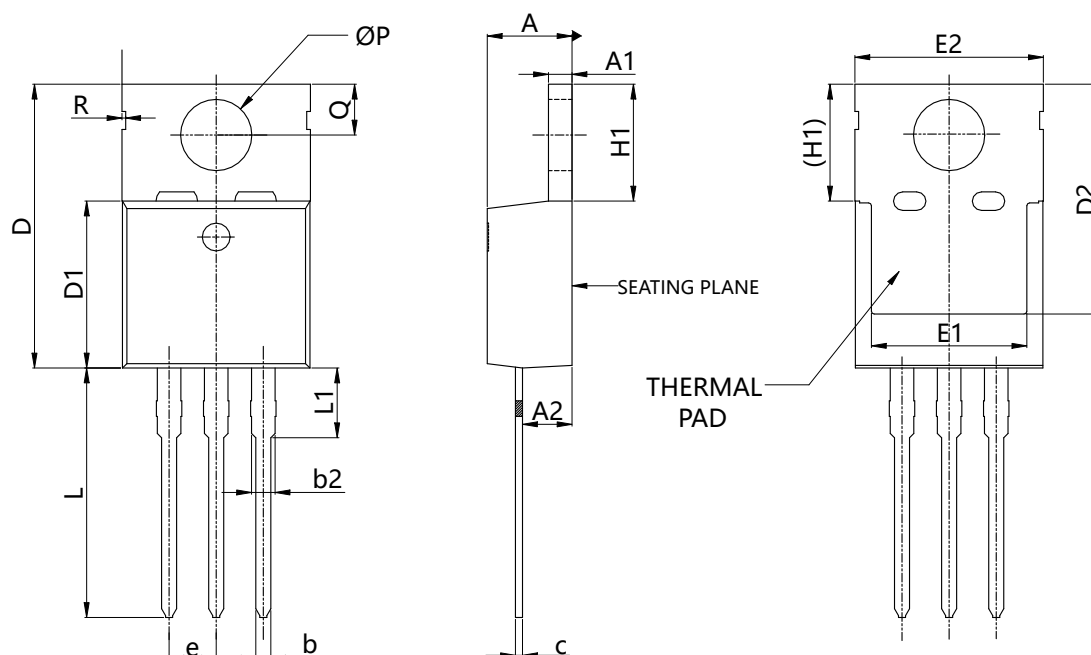


Test Circuit

Peak Diode Recovery dv/dt Test Circuit & Waveforms



TO-220 Package Information



SYMBOL	MILLIMETER		
	MIN.	NOMINAL	MAX.
A	4.47	4.57	4.67
A1	1.17	1.27	1.37
A2	2.52	2.67	2.82
b	0.71	0.81	0.91
b2	1.17	1.27	1.37
c	0.360	0.381	0.500
D	15.00	15.30	15.60
D1	8.70	9.00	9.30
D2	12.19	12.39	12.60
E	9.90	10.11	10.30
E1	8.08	8.38	8.68
E2	10.00	10.16	10.30
e	2.44	2.54	2.64
H1	6.00	6.30	6.60
L	13.15	13.45	13.75
L1	3.56	3.76	3.96
P	3.70	3.84	3.95
Q	2.60	2.74	2.90
R	0.00	0.20	0.35