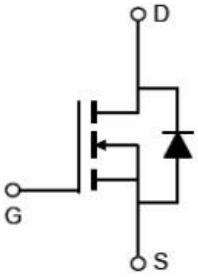
Main Product Characteristics:

V_{DSS}	60V
R_{DS}(on)	6.0mΩ (typ.)
I_D	80A

TO-220
SSF68083X

TO-220F
SSF6808F3X



Schematic Diagram

Features and Benefits:

- Advanced MOSFET process technology
- Special designed for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- Fast switching and reverse body recovery
- 150℃ operating temperature

Description:

It utilizes the latest processing techniques to achieve the high cell density and reduces the on-resistance with high repetitive avalanche rating. These features combine to make this design an extremely efficient and reliable device for use in power switching application and a wide variety of other applications.

Absolute Max Rating:

Symbol	Parameter		Max.	Units
I_D @ TC = 25°C	Continuous Drain Current, V_{GS} @ 10V①		80	A
I_{DM}	Pulsed Drain Current②		320	
P_D @TC = 25°C	Power Dissipation③	TO220	92	W
		TO220F	38	
V_{DS}	Drain-Source Voltage		60	V
V_{GS}	Gate-to-Source Voltage		± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.5mH		191	mJ
T_J T_{STG}	Operating Junction and Storage Temperature Range		-55 to +150	°C

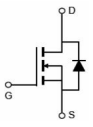
Thermal Resistance

Symbol	Characteristics	TO220	TO220F	Units
$R_{\theta JC}$	Junction-to-case③	1.36	3.3	℃/W

Electrical Characteristics @T_A=25℃unless otherwise specified

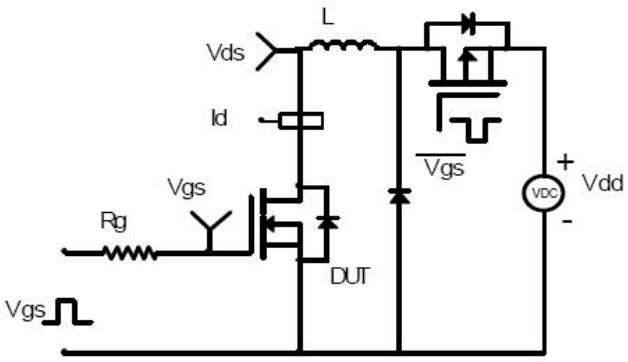
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	60	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	6.0	8	mΩ	V_{GS}=10V,I_D =20A
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	V_{DS} = V_{GS}, I_D =250μA
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} =60V,V_{GS} = 0V
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	72	—	nC	I_D = 30A,
Q_{gs}	Gate-to-Source charge	—	16	—		V_{DS}=30V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	23	—		V_{GS} = 15V
$t_{d(on)}$	Turn-on delay time	—	17	—	ns	V_{GS}=10V, V_{DS}=30V, R_{GEN}=3Ω I_D = 30A
t_r	Rise time	—	28	—		
$t_{d(off)}$	Turn-Off delay time	—	39	—		
t_f	Fall time	—	12	—		
C_{iss}	Input capacitance	—	3951	—	pF	V_{GS} = 0V V_{DS} = 50V f = 1MHz
C_{oss}	Output capacitance	—	203	—		
C_{rss}	Reverse transfer capacitance	—	180	—		

Source-Drain Ratings and Characteristics

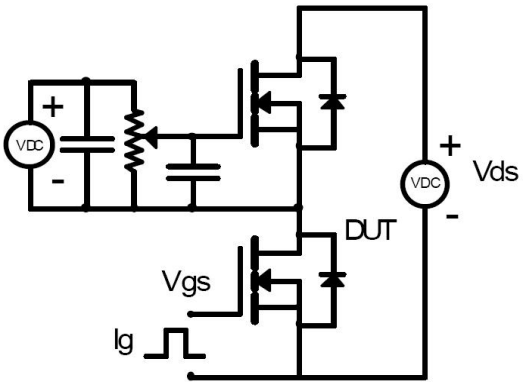
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	80	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	320	A	
V_{SD}	Diode Forward Voltage	—	0.88	1.3	V	I_S=30A, V_{GS}=0V
trr	Reverse Recovery Time	—	31.4	—	ns	I_S=30A,di/dt=100A/us
Qrr	Reverse Recovery Charge	—	31.1	—	nC	

Test Circuits and Waveforms

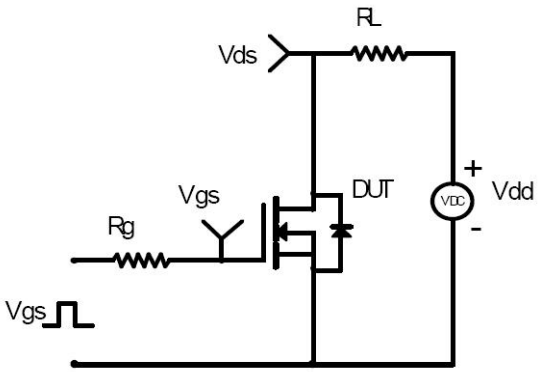
EAS Test Circuit:



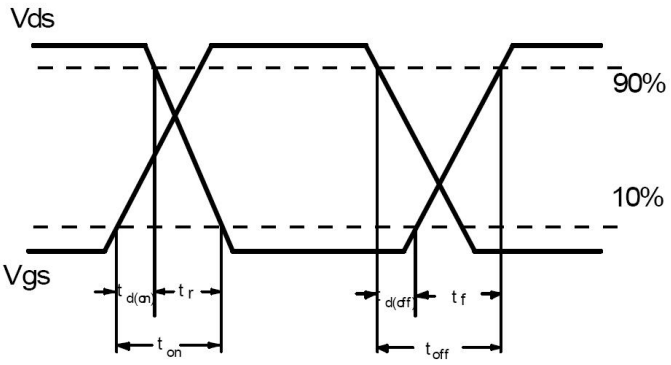
Gate Charge Test Circuit:



Switching Time Test Circuit:



Switching Waveforms:



Notes:

① Calculated continuous current based on maximum allowable junction temperature.

②Repetitive rating; pulse width limited by max. junction temperature.

③The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.

Typical Electrical and Thermal Characteristics

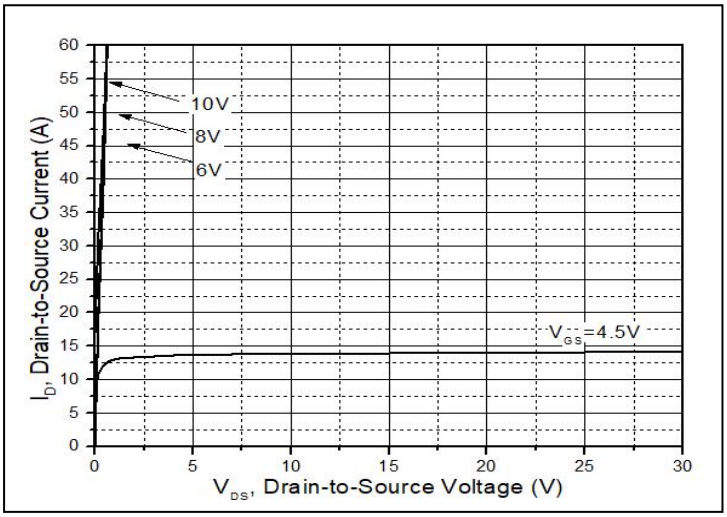


Figure1.Typical Output Characteristics

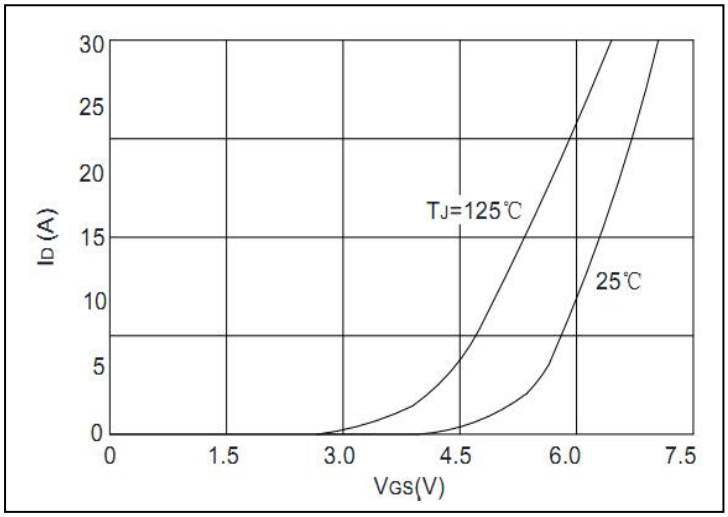


Figure2.Transfer Characteristics

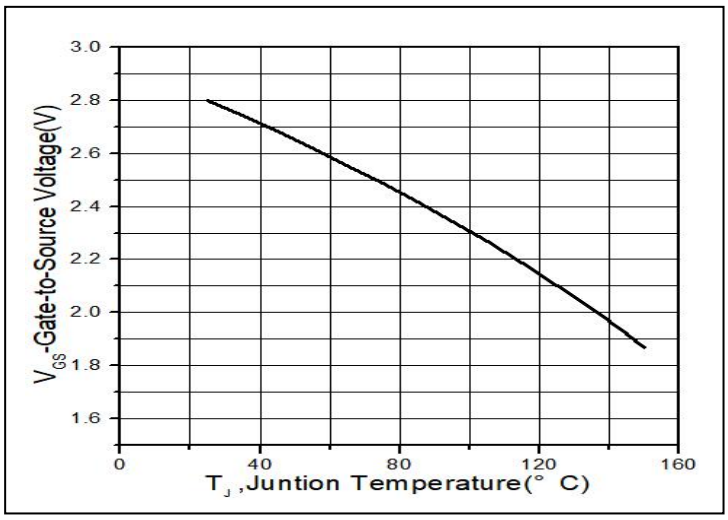


Figure 3. Normalized V_{GS}(th) vs. Junction Temperature

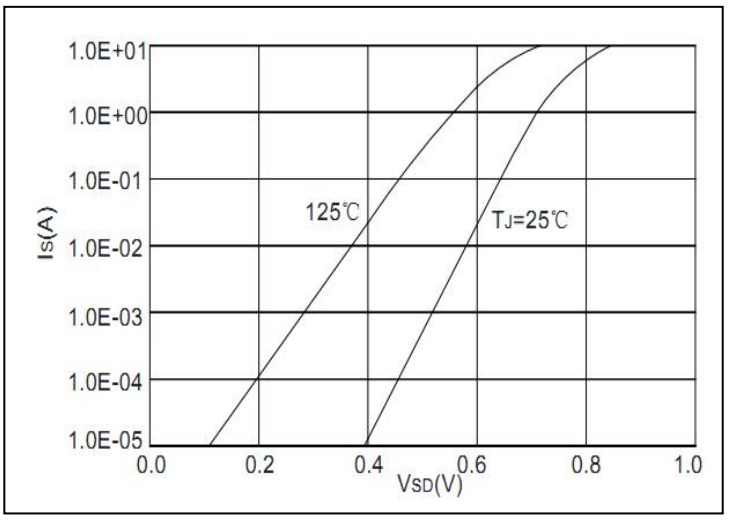


Figure 4.Body Diode Characteristics

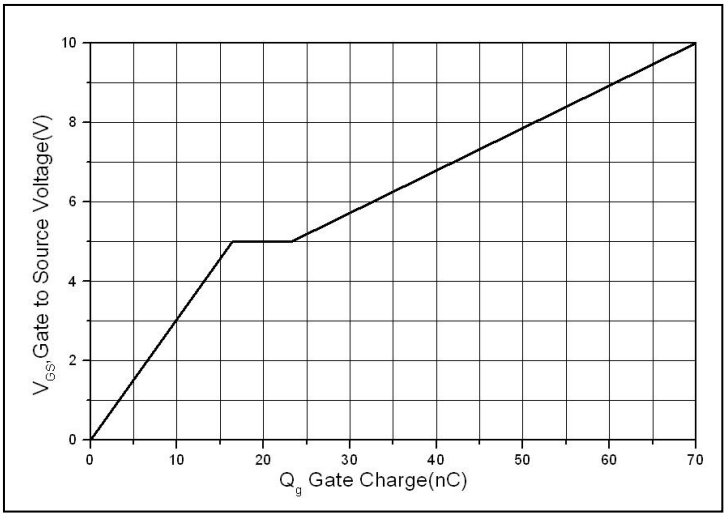


Figure5.Gate Charge

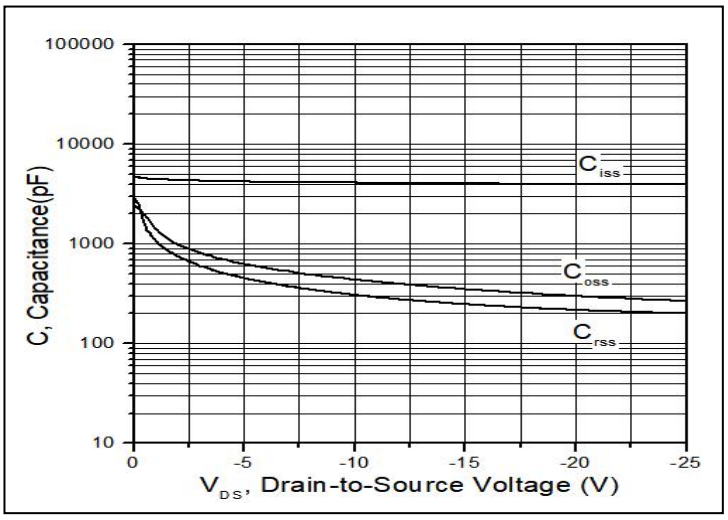


Figure6.Capacitance

Typical Electrical and Thermal Characteristics

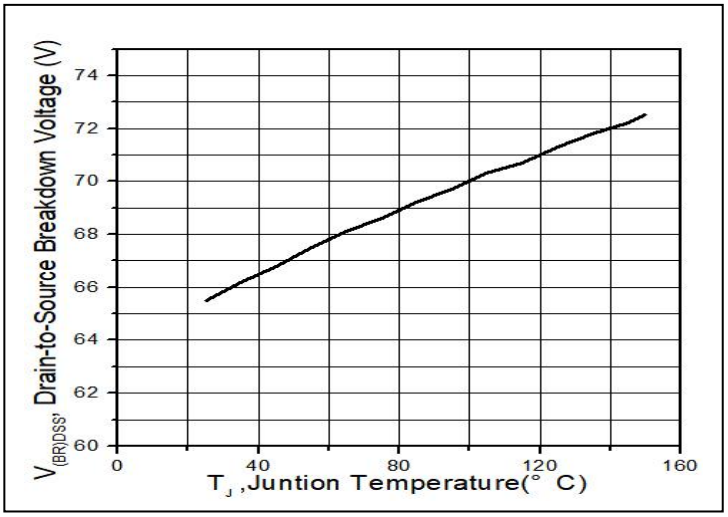


Figure7.Drain-to-Source Breakdown Voltage vs. Temperature

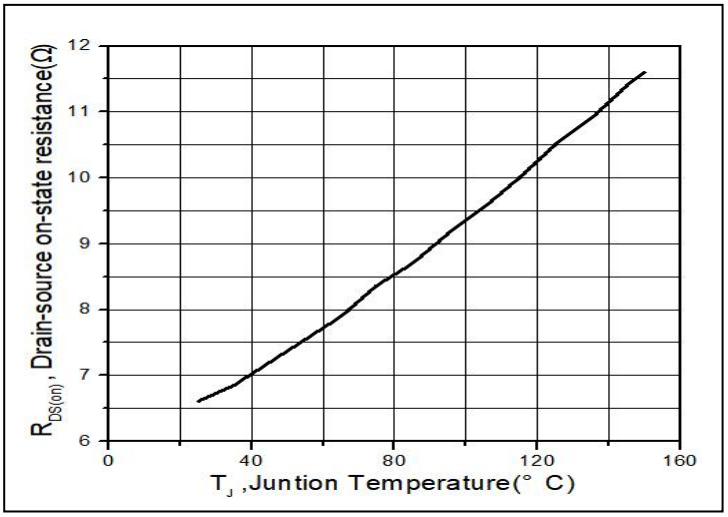


Figure8.Normalized On-Resistance vs. Junction Temperature

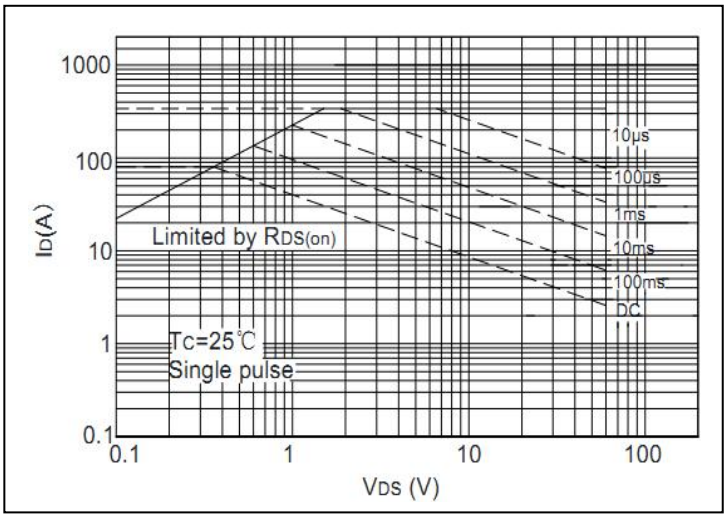


Figure9.Safe Operating Area

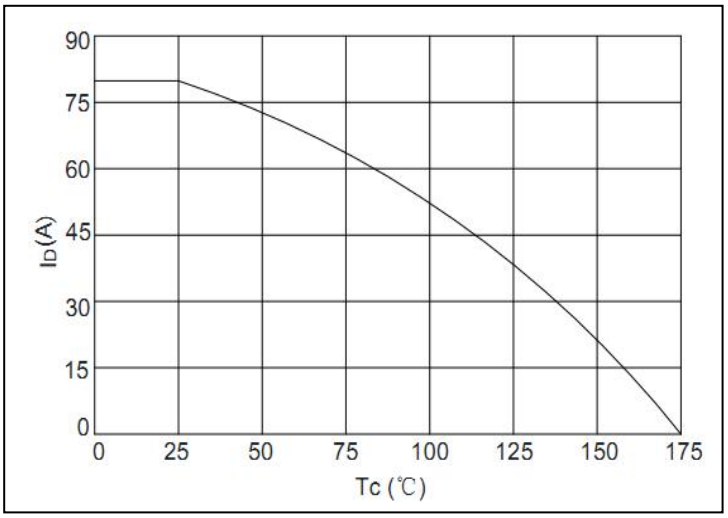


Figure10.Drain Current vs. Case Temperature

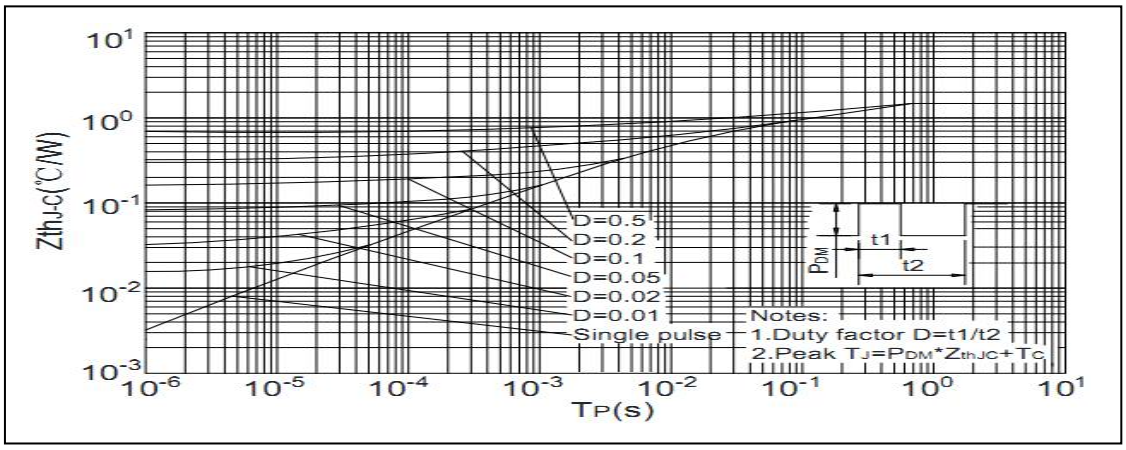
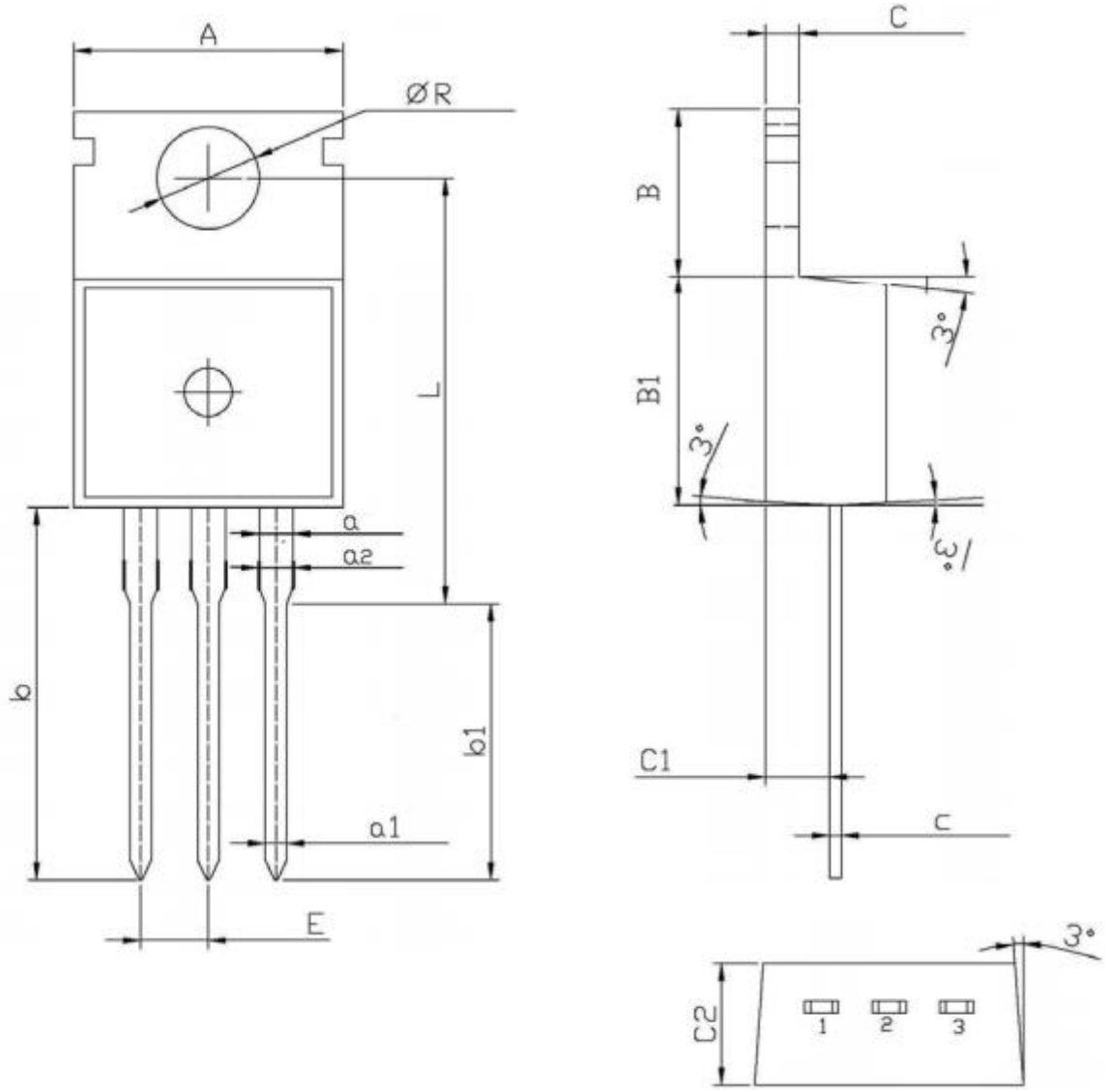


Figure11.Normalized Maximum Transient Thermal Impedance

Mechanical Data：

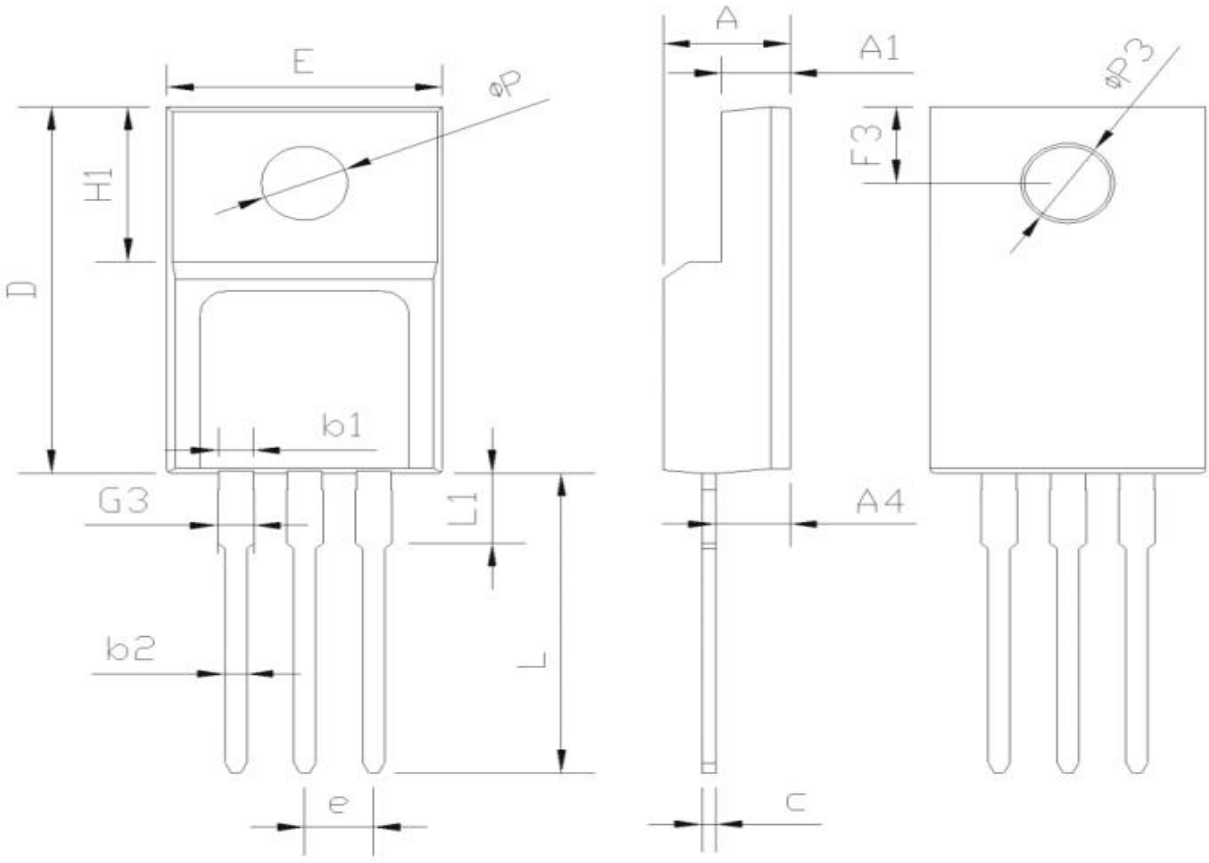
TO-220 Package Outline (Unit:mm)



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	9.8	10.2	C	1.2	1.4
R	3.56	3.64	B	6.3	6.7
L	15.7	16.1	B1	9.0	9.4
b	12.6	13.6	C1	2.2	2.6
b1	9.6	10.6	a1	0.7	0.9
a	1.22	1.32	c	0.4	0.6
E	2.34	2.74	C2	4.3	4.7
a2	1.25	1.45			

Mechanical Data：

TO-220F Package Outline (Unit:mm)



SYMBOL	mm		
	MIN	NOM	MAX
E	9.96	10.16	10.36
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A4	2.56	2.76	2.96
c	0.40	0.50	0.65
D	15.57	15.87	16.17
H1		6.70REF	
e		2.54BSC	
L	12.68	12.98	13.28
L1	2.88	3.03	3.18
ΦP	3.03	3.18	3.38
ΦP3	3.15	3.45	3.65
F3	3.15	3.30	3.45
G3	1.25	1.35	1.55
b1	1.18	1.28	1.43
b2	0.70	0.80	0.95

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