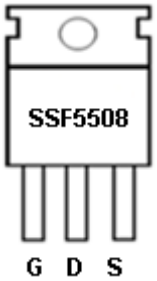
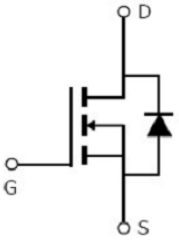
Main Product Characteristics:

V_{DSS}	55V
R_{DS}(on)	4.5mohm(typ.)
I_D	110A

TO220



Marking and pin Assignment



Schematic diagram

Features and Benefits:

- Advanced trench 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
- 175℃ operating temperature

Description:

It utilizes the latest trench 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	110	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V①	80	
I_{DM}	Pulsed Drain Current②	440	
P_D @TC = 25°C	Power Dissipation③	205	W
	Linear Derating Factor	2.0	W/°C
V_{DS}	Drain-Source Voltage	55	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=0.3mH②	375	mJ
I_{AR}	Avalanche Current @ L=0.3mH②	50	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C

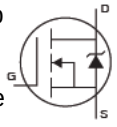
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case③	—	0.73	℃/W
$R_{\theta JA}$	Junction-to-ambient (t ≤ 10s) ④	—	62	℃/W
	Junction-to-Ambient (PCB mounted, steady-state) ④	—	40	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

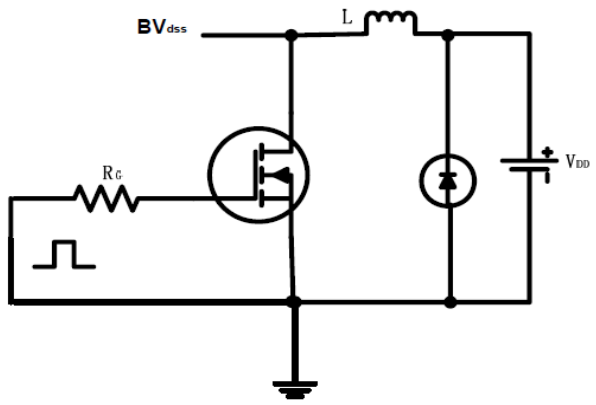
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	55	—	—	V	V_{GS} = 0V, ID = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	4.5	5.5	mΩ	V_{GS}=10V,I_D = 68A
		—	7	—		T_J = 125℃
$V_{GS(th)}$	Gate threshold voltage	2.5	—	3.5	V	V_{DS} = V_{GS}, I_D = 250μA
		—	2.4	—		T_J = 125℃
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 55V,V_{GS} = 0V
		—	—	50		T_J = 125°C
I_{GSS}	Gate-to-Source forward leakage	—	—	100	nA	V_{GS} =20V
		-100	—	—		V_{GS} = -20V
Q_g	Total gate charge	—	124.7	—	nC	I_D = 30A,
Q_{gs}	Gate-to-Source charge	—	24.46	—		V_{DS}=30V,
Q_{gd}	Gate-to-Drain("Miller") charge	—	48.68	—		V_{GS} = 10V
$t_{d(on)}$	Turn-on delay time	—	19.62	—	ns	V_{GS}=10V, VDS=30V,
t_r	Rise time	—	18.82	—		R_L=15Ω,
$t_{d(off)}$	Turn-Off delay time	—	69.76	—		R_{GEN}=2.55Ω
t_f	Fall time	—	30.12	—		
C_{iss}	Input capacitance	—	5607	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	463	—		V_{DS} = 25V
C_{rss}	Reverse transfer capacitance	—	454	—		f = 600KHz

Source-Drain Ratings and Characteristics

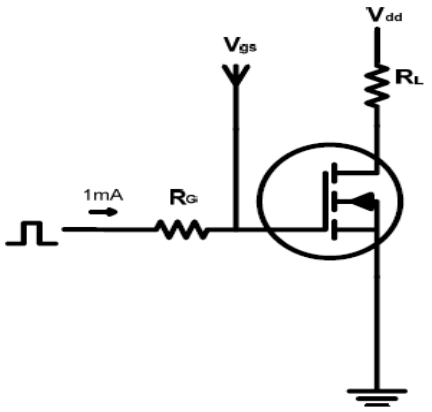
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	110	A	MOSFET symb showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	440	A	
V_{sd}	Diode Forward Voltage	—	0.94	1.3	V	I_S=68A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	—	37	—	ns	T_J = 25°C, I_F =68A, di/dt = 100A/μs
Q_{rr}	Reverse Recovery Charge	—	60	—	nC	

Test circuits and Waveforms

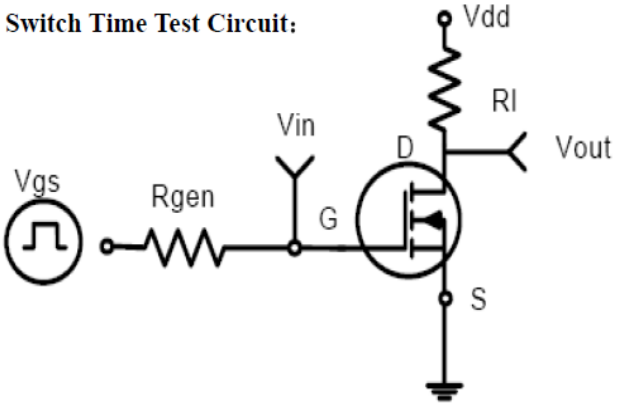
EAS test circuits:



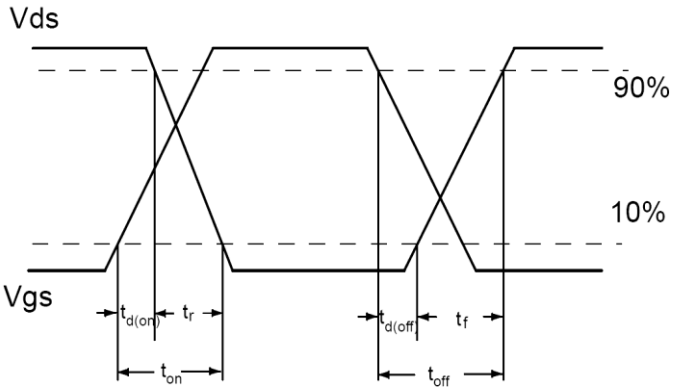
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

①The maximum current rating is limited by bond-wires.
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.
④The value of $R_{\theta JA}$ is measured with the device mounted on 1in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C
⑤These curves are based on the junction-to-case thermal impedence which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}$=175°C.
⑥ The maximum current rating is limited by bond-wires.

Typical electrical and thermal characteristics

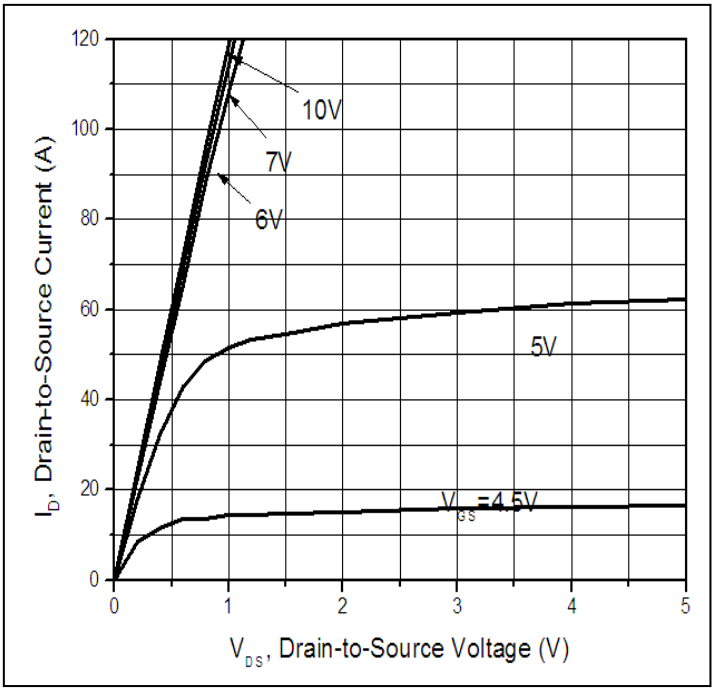


Figure 1: Typical Output Characteristics

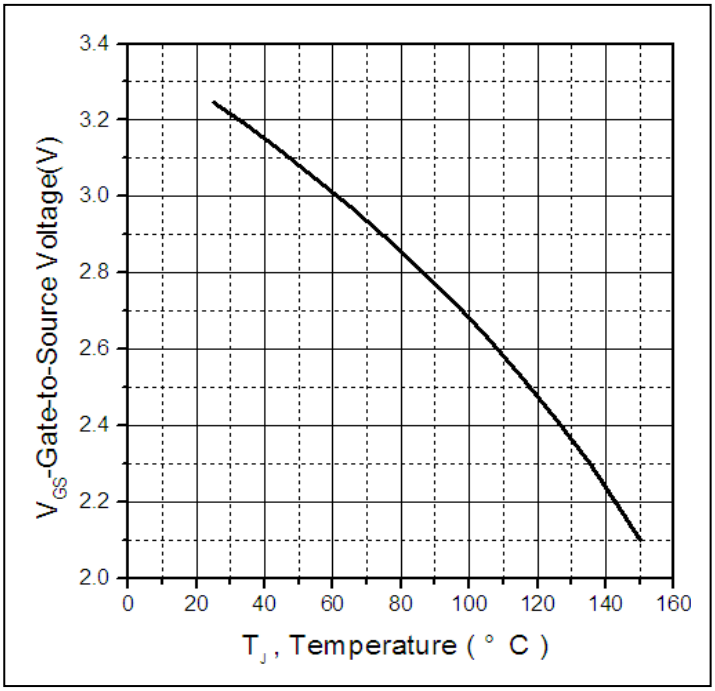


Figure 2. Gate to source cut-off voltage

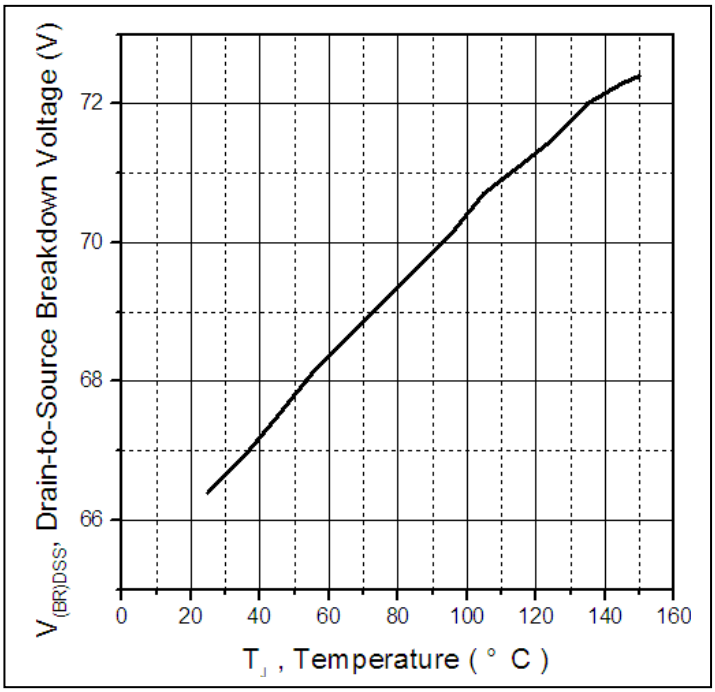


Figure 3. Drain-to-Source Breakdown Voltage vs. Temperature

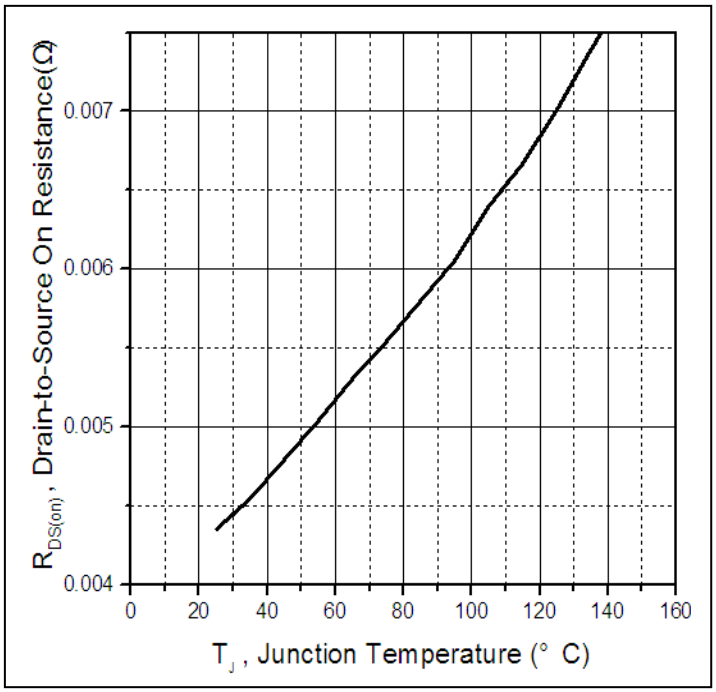


Figure 4: Normalized On-Resistance Vs. Case Temperature

Typical electrical and thermal characteristics

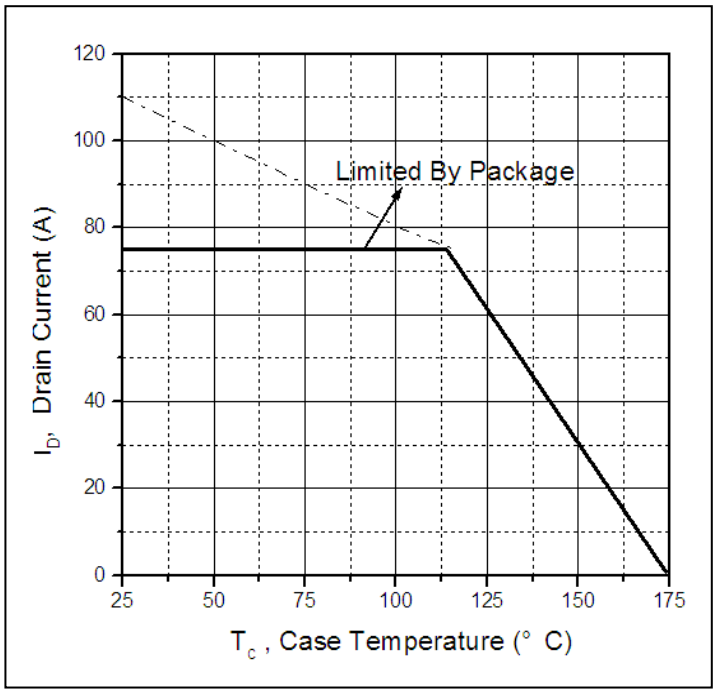


Figure 5. Maximum Drain Current Vs. Case Temperature

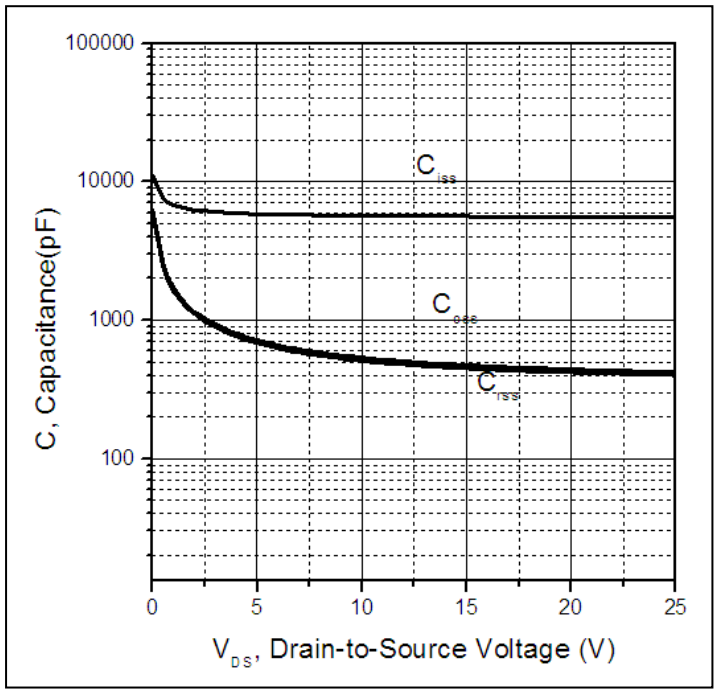


Figure 6.Typical Capacitance Vs. Drain-to-Source Voltage

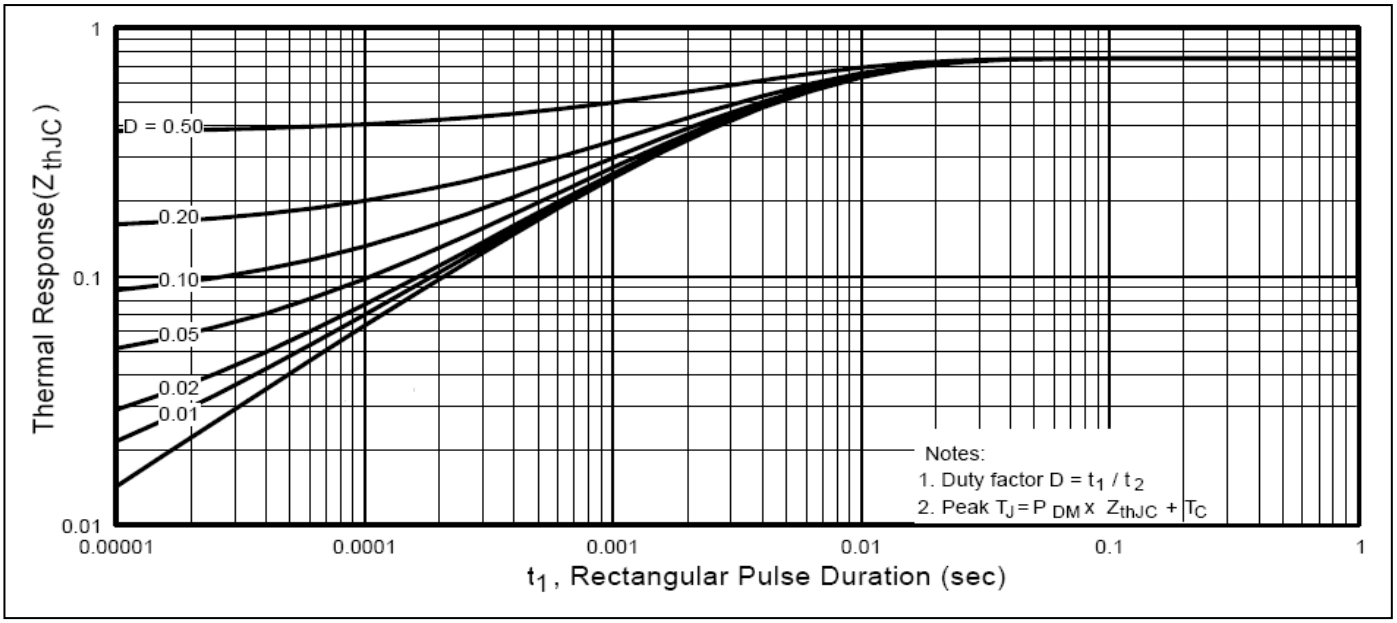
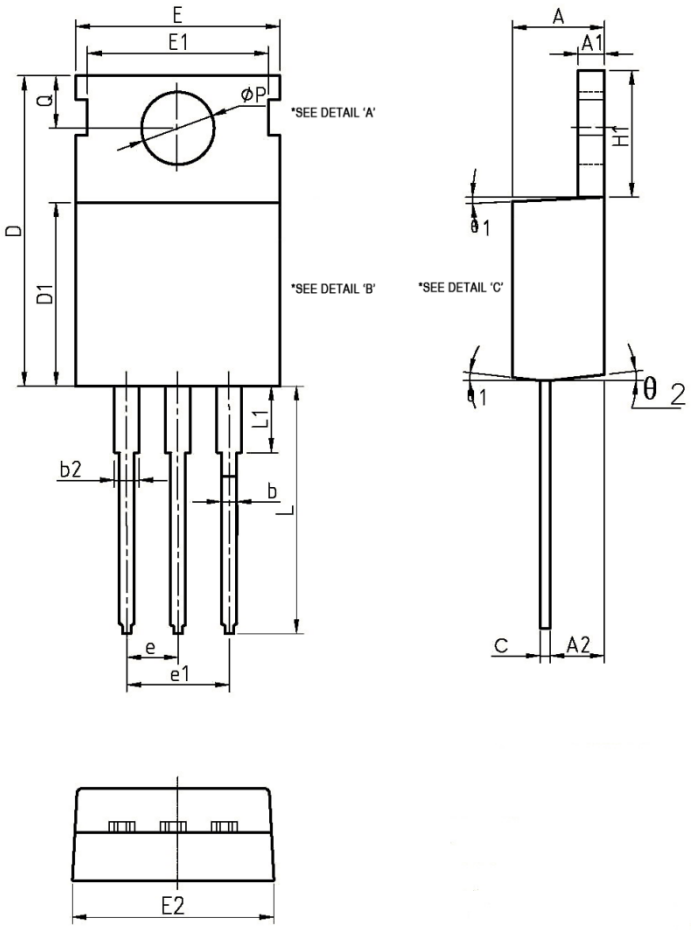


Figure7. Maximum Effective Transient Thermal Impedance, Junction-to-Case

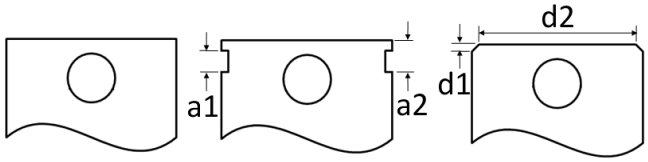
TO-220 Mechanical Data



COMMON DIMENSIONS

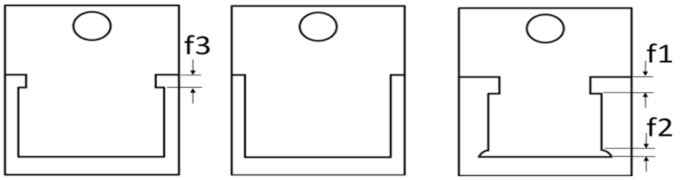
SYMBOL	MM		
	MIN	NOM	MAX
A	4.3	4.57	4.7
A1	1.2	-	1.4
A2	2.2	2.4	2.9
b	0.77	-	0.9
b2	1.23	-	1.36
c	0.4	-	0.7
D	15.25	15.6	15.8
D1	8.59	9.1	9.4
E	9.66	10	10.4
E1	-	8.7	-
E2	9.66	10	10.4
e	2.54BSC		
e1	5.08BSC		
H1	6.2	6.5	6.7
L	12.6	-	14.27
L1	-	-	3.95
ΦP	3.5	3.6	3.9
Q	2.65	2.8	2.95
θ1	1°	3°	5°
θ2	1°	3°	5°
a1	-	1.8	-
a2	-	3.0	-
d1	-	2.0	-
d2	-	7.6	-
f1	-	1.4	-
f2	-	1.5	-
f3	-	1.0	-
g1	-	2.8	-

DETAIL 'A'



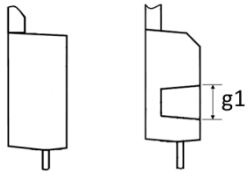
OPTION1 OPTION2 OPTION3

DETAIL 'B' (BACK VIEW)



OPTION1 OPTION2 OPTION3

DETAIL 'C'



OPTION1 OPTION2

Ordering and Marking Information

Device Marking: SSF5508

Package (Available)

TO220

Operating Temperature Range

C : -55 to 175 °C

Devices per Unit

Package Type	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO220	50	20	1000	6	6000

Reliability Test Program

Test Item	Conditions	Duration	Sample Size
High Temperature Reverse Bias(HTRB)	T_j=125℃ to 175℃ @ 80% of Max V_{DSS}/V_{CES}/VR	168 hours 500 hours 1000 hours	3 lots x 77 devices
High Temperature Gate Bias(HTGB)	T_j=150℃ or 175℃ @ 100% of Max V_{GSS}	168 hours 500 hours 1000 hours	3 lots x 77 devices

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