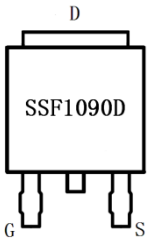
Main Product Characteristics:

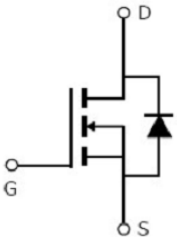
V_{DSS}	100V
R_{DS}(on)	60mΩ (typ.)
I_D	15A ①



TO-252 (D-PAK)



Marking and pin Assignment



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
- 175℃ 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} @ 10V ①	15	A
I_D @ TC = 100°C	Continuous Drain Current, V_{GS} @ 10V ①	10	
I_{DM}	Pulsed Drain Current ②	60	
P_D @TC = 25°C	Power Dissipation ③	39	W
	Linear Derating Factor	0.26	W/°C
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy @ L=22mH	142	mJ
I_{AS}	Avalanche Current @ L=22mH	3.6	A
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C

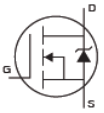
Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-case ③	—	3.85	℃/W
$R_{\theta JA}$	Junction-to-Ambient (t ≤ 10s)④	—	60	℃/W
	Junction-to-Ambient (PCB mounted, steady-state) ④	—	42	℃/W

Electrical Characterizes @T_A=25℃ unless otherwise specified

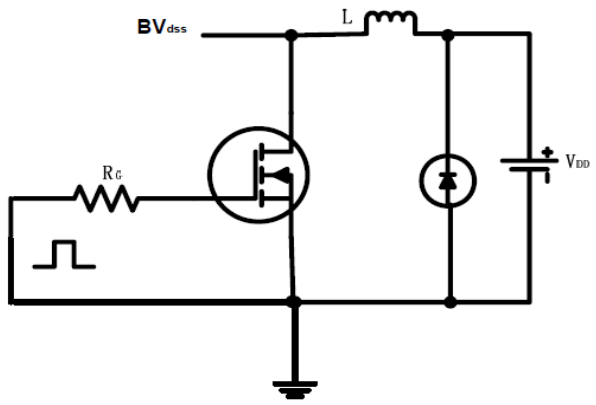
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source breakdown voltage	100	—	—	V	V_{GS} = 0V, I_D = 250μA
$R_{DS(on)}$	Static Drain-to-Source on-resistance	—	60	90	mΩ	V_{GS}=10V,I_D = 2A
		—	125	—		T_J = 125℃
$V_{GS(th)}$	Gate threshold voltage	2	—	4	V	V_{DS} = V_{GS}, I_D = 250μA
		—	2.46	—		T_J = 125℃
I_{DSS}	Drain-to-Source leakage current	—	—	1	μA	V_{DS} = 30V, V_{GS} =0V
		—	—	50		T_J = 125℃
I_{GSS}	Gate-to-Source forward leakage	—	—	100	A	V_{GS} =20V
	Gate-to-Source reverse leakage	—	—	-100		V_{GS} = -20V
Q_g	Total gate charge	—	20	—	nC	I_D = 9.2A
Q_{gs}	Gate-to-Source charge	—	4.3	—		V_{DD}=80V
Q_{gd}	Gate-to-Drain("Miller") charge	—	7.6	—		V_{GS} = 10V
$t_{d(on)}$	Turn-on delay time	—	11	—	ns	V_{GS}=10V, VDD=50V,
t_r	Rise time	—	31	—		R_L=5.4Ω,R_{GEN}=18Ω
$t_{d(off)}$	Turn-Off delay time	—	39	—		I_D =9.2A
t_f	Fall time	—	28	—		
C_{iss}	Input capacitance	—	739	—	pF	V_{GS} = 0V
C_{oss}	Output capacitance	—	58	—		V_{DS} = 25V
C_{rss}	Reverse transfer capacitance	—	40	—		f = 1MHz

Source-Drain Ratings and Characteristics

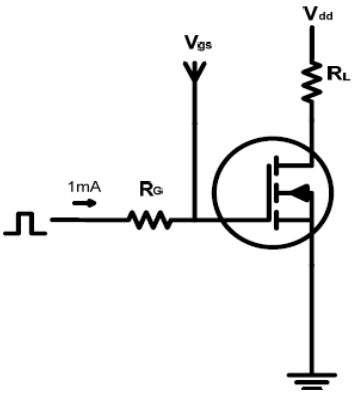
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	15 ①	A	MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	Pulsed Source Current (Body Diode)	—	—	60	A	
V_{sd}	Diode Forward Voltage	—	0.8	1.5	V	I_S=3A, V_{GS}=0V,T_J= 25°C
t_{rr}	Reverse Recovery Time	—	35	—	ns	T_J =25°C, I_F =9.2A,
Q_{rr}	Reverse Recovery Charge	—	67	—	nC	di/dt = 100A/μs

Test circuits and Waveforms

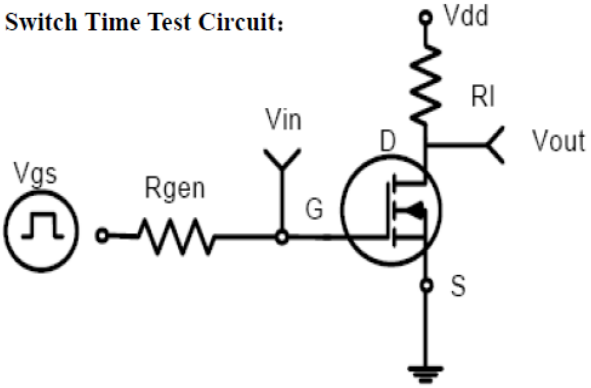
EAS test circuits:



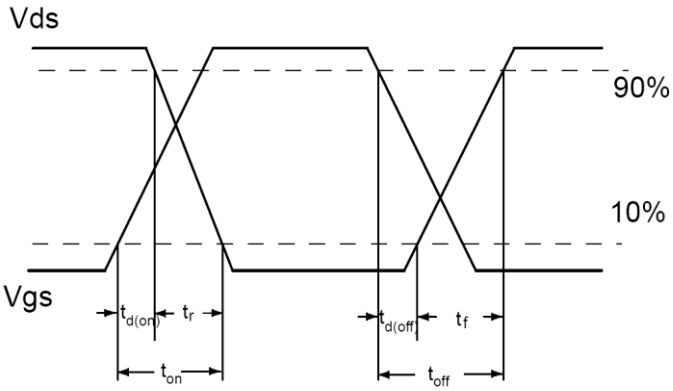
Gate charge test circuit:



Switch Time Test Circuit:



Switch Waveforms:



Notes:

①Calculated 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.

④The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C

Typical electrical and thermal characteristics

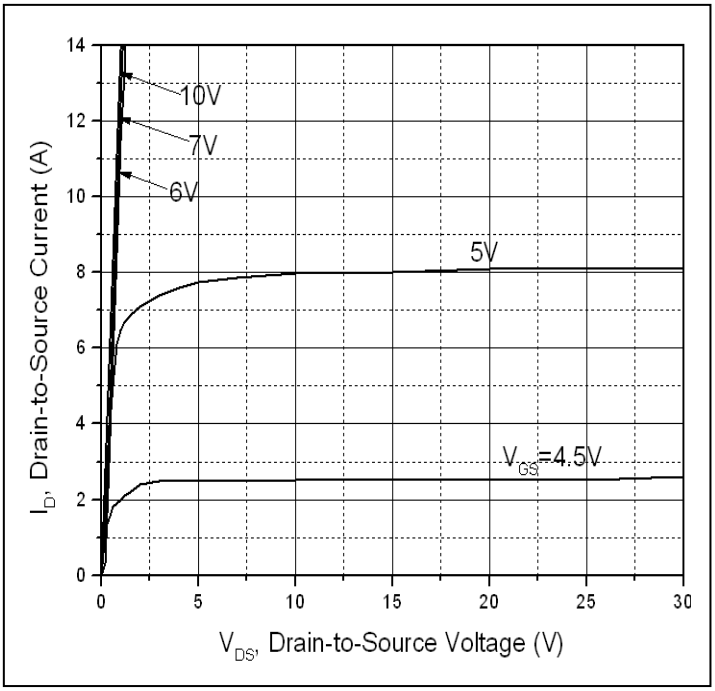


Figure 1: Typical Output Characteristics

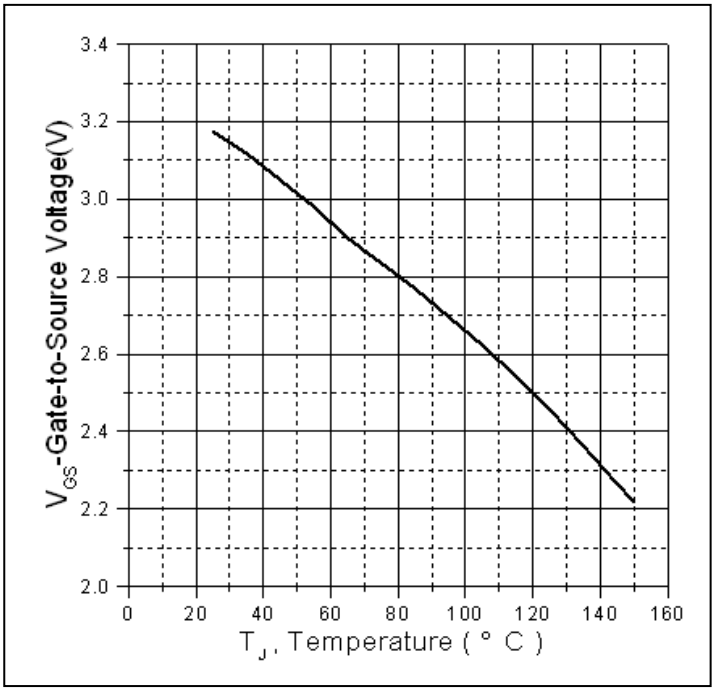


Figure 2. Gate to source cut-off voltage

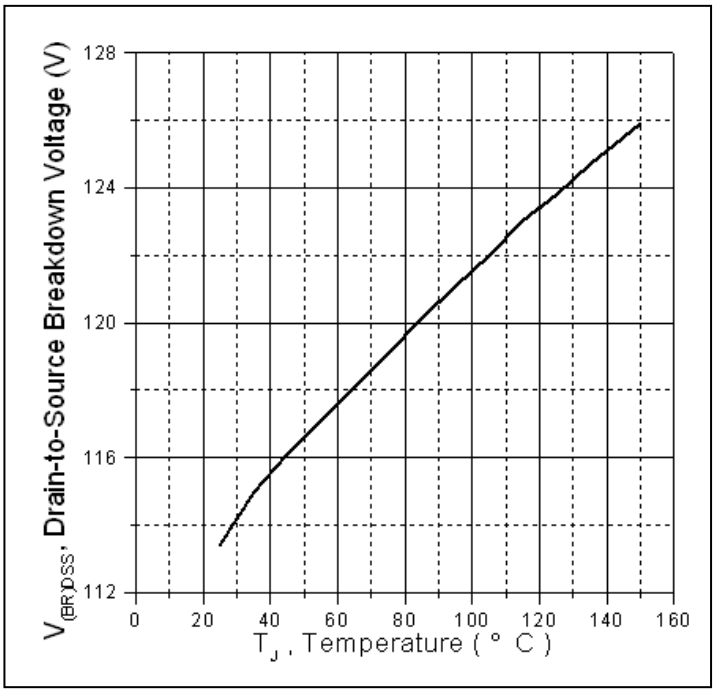


Figure 3. Drain-to-Source Breakdown Voltage Vs. Case Temperature

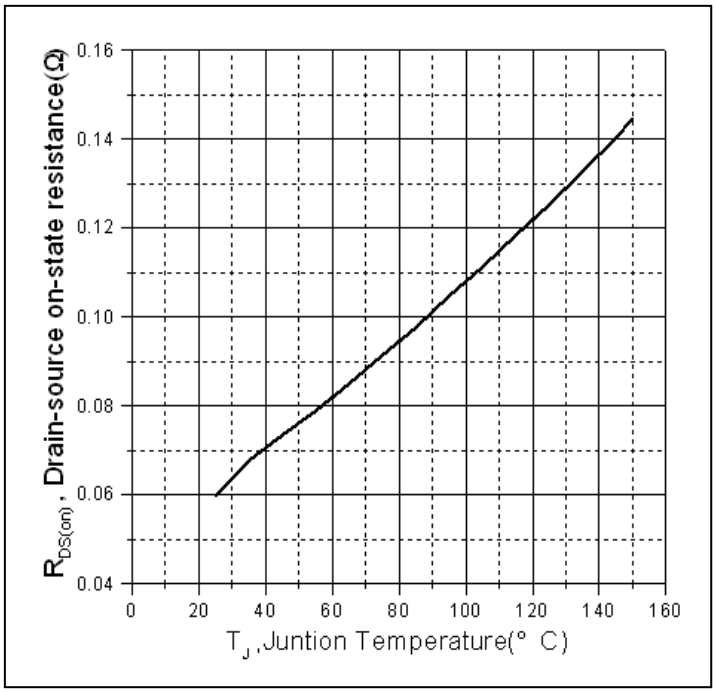


Figure 4: Normalized On-Resistance Vs. Case Temperature

Typical electrical and thermal characteristics

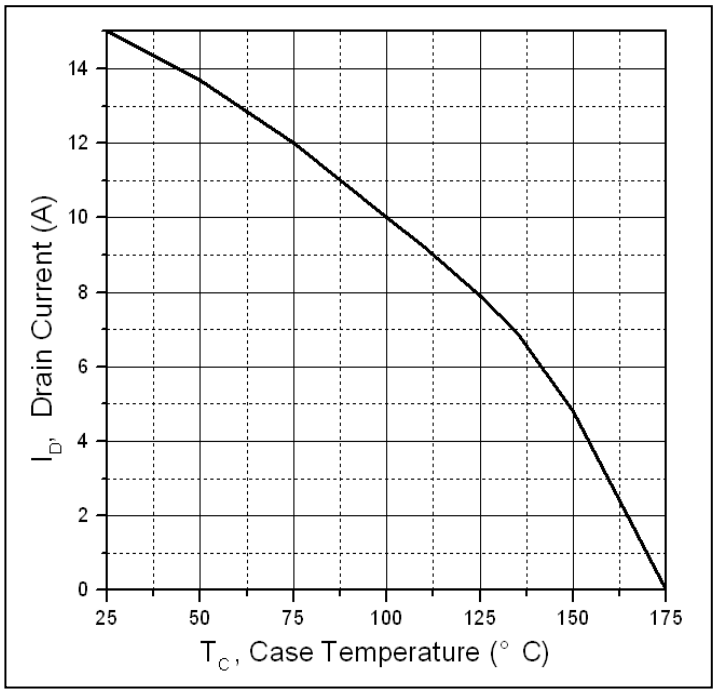


Figure 5. Maximum Drain Current Vs. Case Temperature

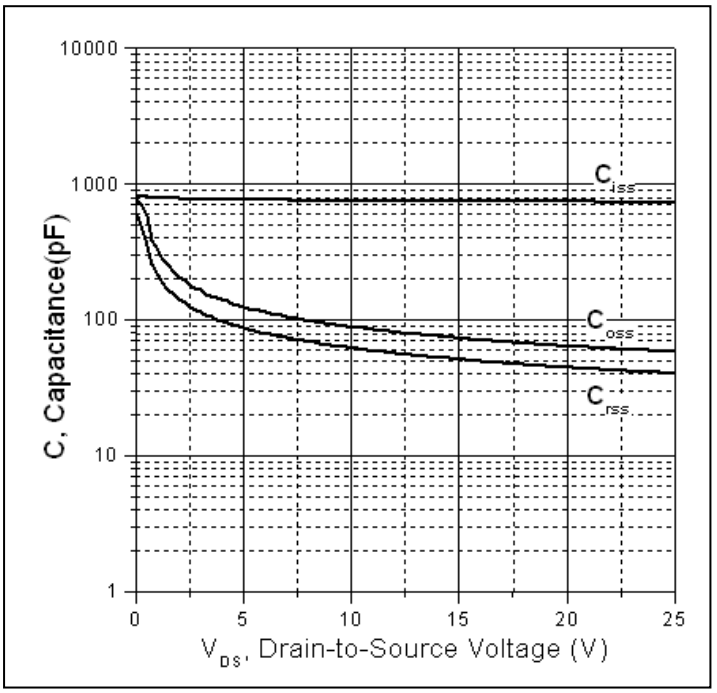


Figure 6.Typical Capacitance Vs. Drain-to-Source Voltage

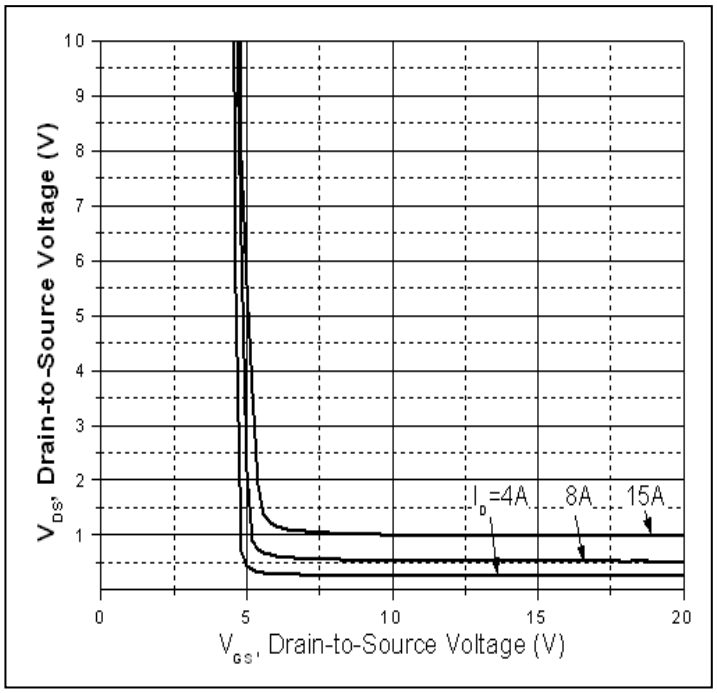


Figure 7. Drain-to-Source Voltage Vs. Gate-to-Source Voltage

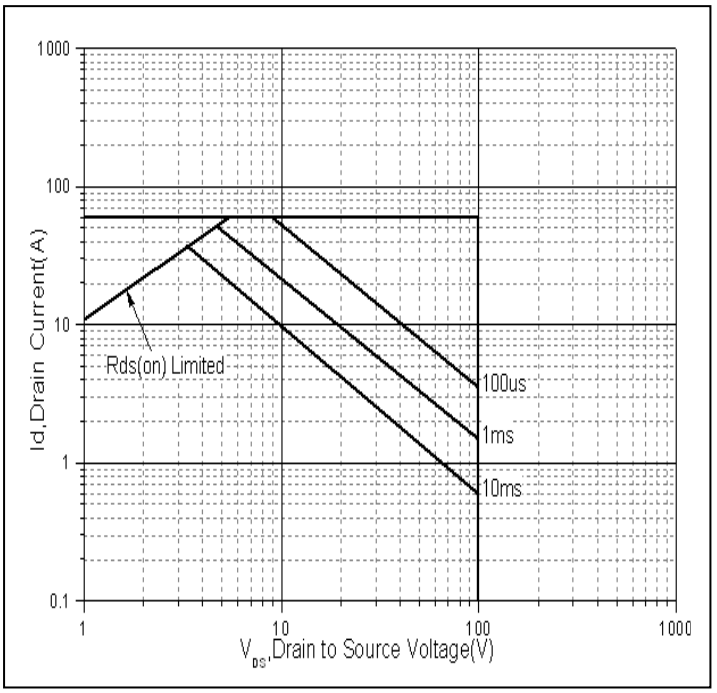
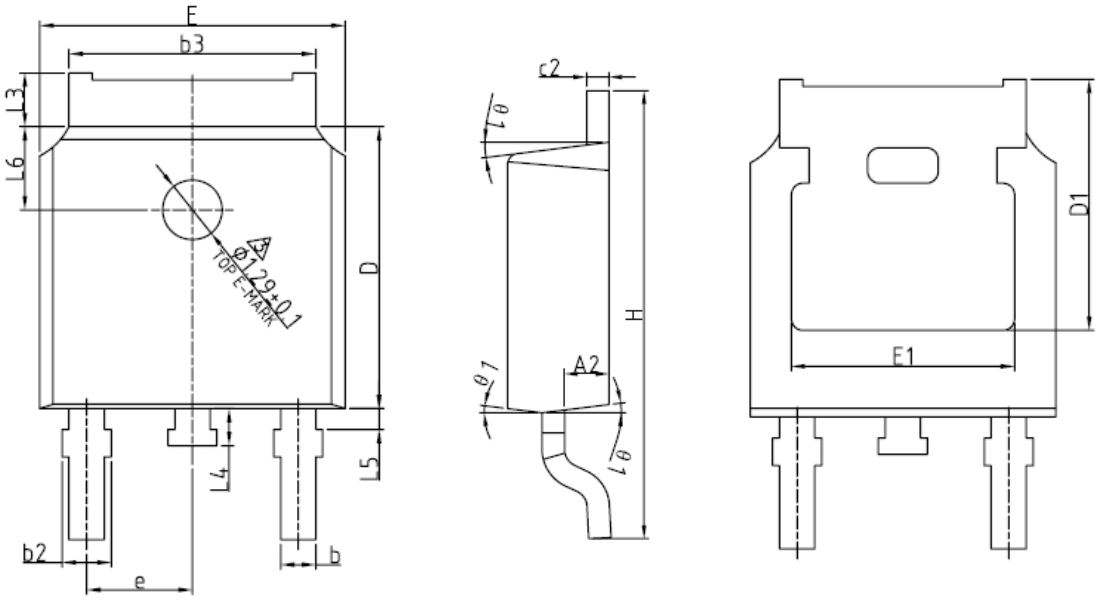
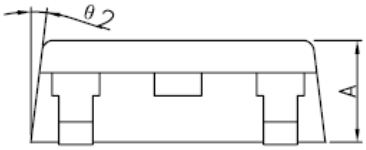


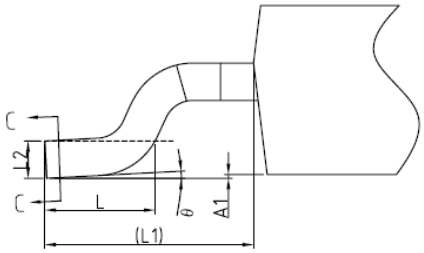
Figure 8.Maximum Safe Operating Area

Mechanical Data：

TO-252 PACKAGE INFORMATION UNITS:mm







SYMBOL	MIN	NOM	MAX
A	2.20	2.30	2.38
A1	0	–	0.10
A2	0.90	1.01	1.10
b	0.72	–	0.85
b1	0.71	0.76	0.81
b2	0.72	–	0.90
b3	5.13	5.33	5.46
c	0.47	–	0.60
c1	0.46	0.51	0.56
c2	0.47	–	0.60
D	6.00	6.10	6.20
D1	5.25	–	–
E	6.50	6.60	6.70
E1	4.70	–	–
e	2.186	2.286	2.386
H	9.80	10.10	10.40
L	1.40	1.50	1.70
L1		2.90REF	
L2		0.51BSC	
L3	0.90	–	1.25
L4	0.60	0.80	1.00
L5	0.15	–	0.75
L6		1.80REF	
θ	0°	–	8°
θ1	5°	7°	9°
θ2	5°	7°	9°

Ordering and Marking Information

Device Marking: SSF1090D

Package (Available)

TO-252 (D-PAK)

Operating Temperature Range

C : -55 to 175 °C

Devices per Unit

Package Type	Units/ Tape	Tapes/Inner Box	Units/Inner Box	Inner Boxes/Carton Box	Units/Carton Box
TO-252	2500	1	2500	7	17500

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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