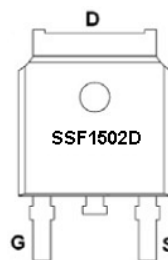
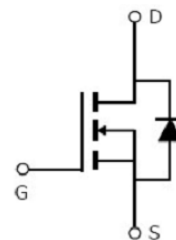


**Main Product Characteristics:**

$V_{DSS}$	170V(typ)
$R_{DS(on)}$	0.15 $\Omega$ (typ)
$I_D$	8A


**DPAK**

**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°C 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
$I_D @ TC = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	8	A
$I_D @ TC = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V$ ①	5	
$I_{DM}$	Pulsed Drain Current②	32	
$P_D @ TC = 25^\circ C$	Power Dissipation③	33	W
	Linear Derating Factor	0.18	W/°C
$V_{DS}$	Drain-Source Voltage	150	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 175	°C

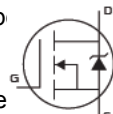
## Thermal Resistance

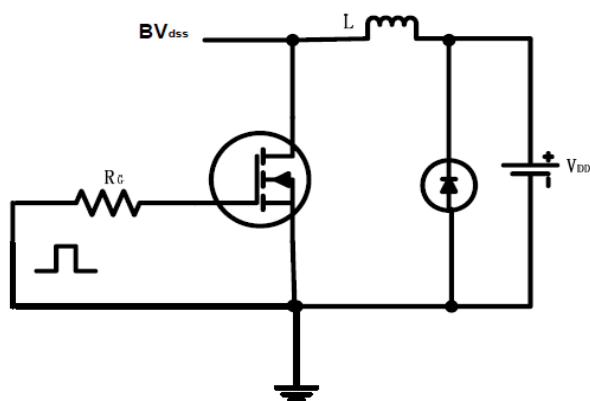
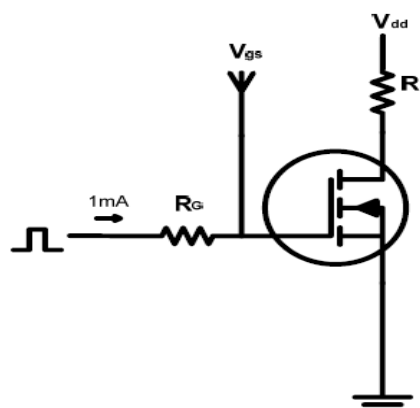
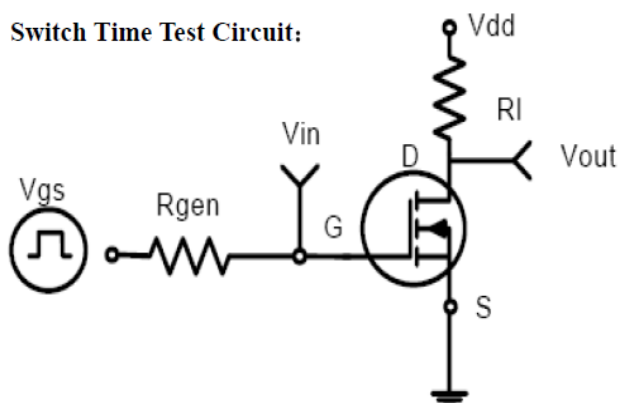
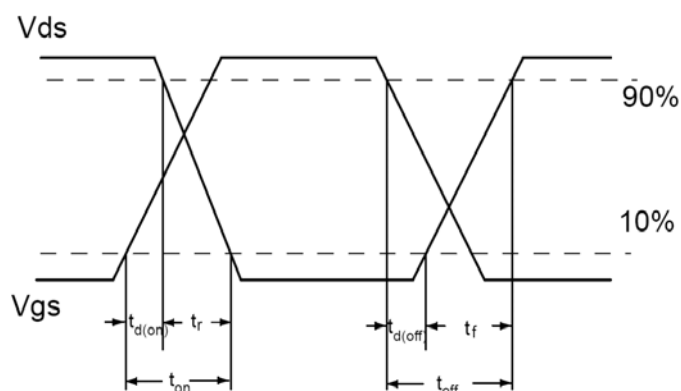
Symbol	Characterizes	Typ.	Max.	Units
R <sub>θJC</sub>	Junction-to-case <sup>③</sup>	—	4.5	°C/W
R <sub>θJA</sub>	Junction-to-Ambient (t ≤ 10s) <sup>④</sup>	—	70	°C/W
	Junction-to-Ambient (PCB mounted, steady-state) <sup>④</sup>	—	53	°C/W

## Electrical Characterizes @T<sub>A</sub>=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source breakdown voltage	150	170		V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
R <sub>DSON</sub>	Static Drain-to-Source on-resistance	—	0.15	0.2	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> = 3A T <sub>J</sub> = 125°C
		—	0.32	—		
V <sub>GS(th)</sub>	Gate threshold voltage	2	—	4	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA T <sub>J</sub> = 125°C
		—	2.7	—		
I <sub>DSS</sub>	Drain-to-Source leakage current	—	—	1	μA	V <sub>DS</sub> = 150, V <sub>GS</sub> =10V T <sub>J</sub> = 125°C
		—	—	50		
I <sub>GSS</sub>	Gate-to-Source forward leakage			100	A	V <sub>GS</sub> = 20V
	Gate-to-Source reverse leakage	-100	-			V <sub>GS</sub> = -20V
Q <sub>g</sub>	Total gate charge		37		nC	I <sub>D</sub> = 6A V <sub>DD</sub> =120V V <sub>GS</sub> = 10V
Q <sub>gs</sub>	Gate-to-Source charge		7.5			
Q <sub>gd</sub>	Gate-to-Drain("Miller") charge		13.			
t <sub>d(on)</sub>	Turn-on delay time		32		ns	V <sub>GS</sub> =10V, V <sub>DD</sub> =24.6V, R <sub>L</sub> =8.2Ω, R <sub>GEN</sub> =2.55Ω I <sub>D</sub> =3.00A
t <sub>r</sub>	Rise time		51.5			
t <sub>d(off)</sub>	Turn-Off delay time		157			
t <sub>f</sub>	Fall time		67			
C <sub>iss</sub>	Input capacitance		1524		pF	V <sub>GS</sub> = 0V V <sub>DS</sub> = 25V f = 800KHz
C <sub>oss</sub>	Output capacitance		171			
C <sub>rss</sub>	Reverse transfer capacitance		77			

## Source-Drain Ratings and Characteristics

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	8	A	MOSFET symb showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode)	—	—	32	A	
V <sub>SD</sub>	Diode Forward Voltage		0.82	1.5	V	I <sub>S</sub> =6.00A, V <sub>GS</sub> =0V, T <sub>J</sub> = 25°C
t <sub>rr</sub>	Reverse Recovery Time		90		ns	T <sub>J</sub> = 25°C, I <sub>F</sub> =6.00A, di/dt =
Q <sub>rr</sub>	Reverse Recovery Charge		105		nC	25.0A/μs

**Test circuits and Waveforms**
**EAS test circuits:**

**Gate charge test circuit:**

**Switch Time Test Circuit:**

**Switch Waveforms:**

**Notes:**

- ① The maximum current rating is limited by bond-wires.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation PD is based on max. junction temperature, using junction-to-case thermal resistance.
- ④ The 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  $T_A = 25^\circ C$
- ⑤ These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of  $T_{J(MAX)} = 175^\circ C$ .
- ⑥ The maximum current rating is limited by bond-wires.

Typical electrical and thermal characteristics

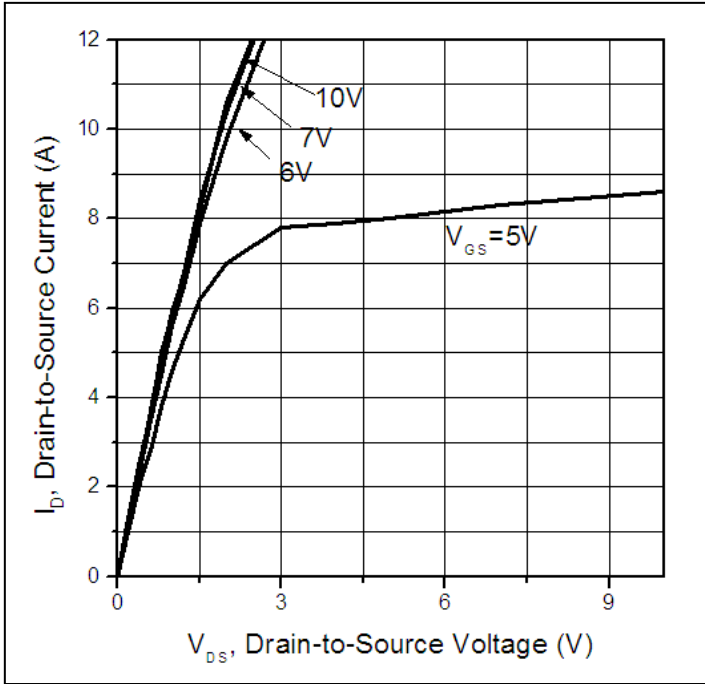


Figure 1: Typical Output Characteristics

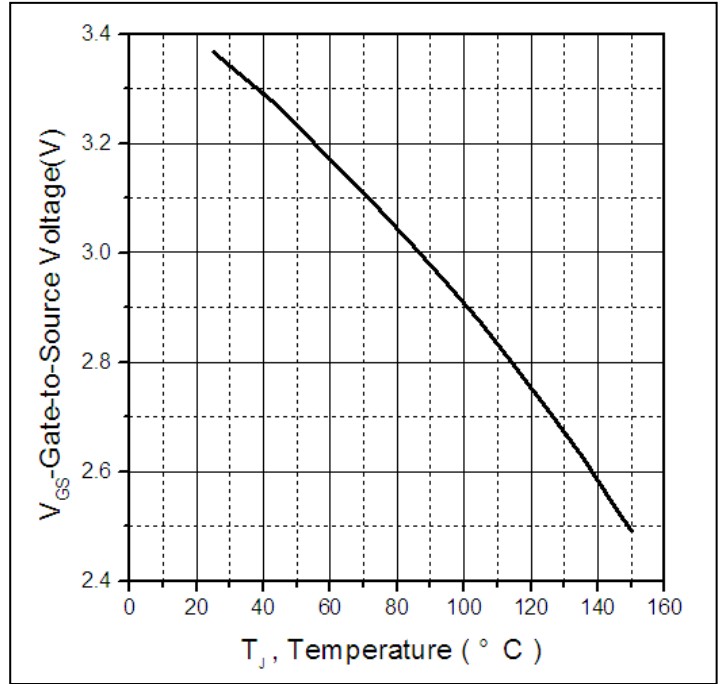


Figure 2. Gate to source cut-off voltage

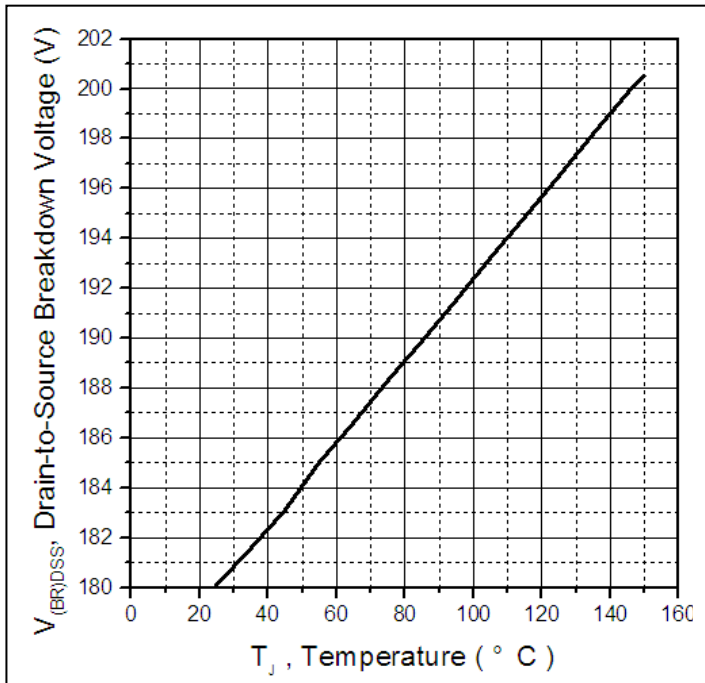


Figure 3. Drain-to-Source Breakdown Voltage vs. Temperature

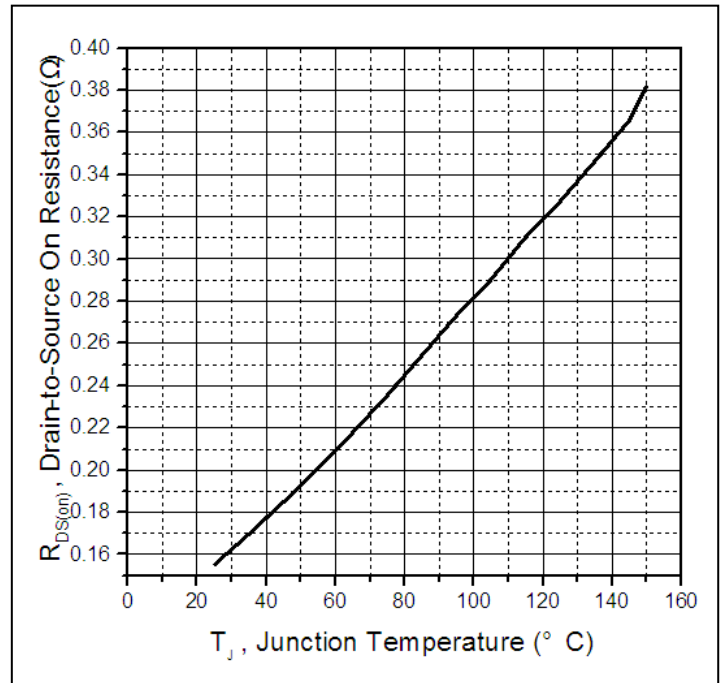
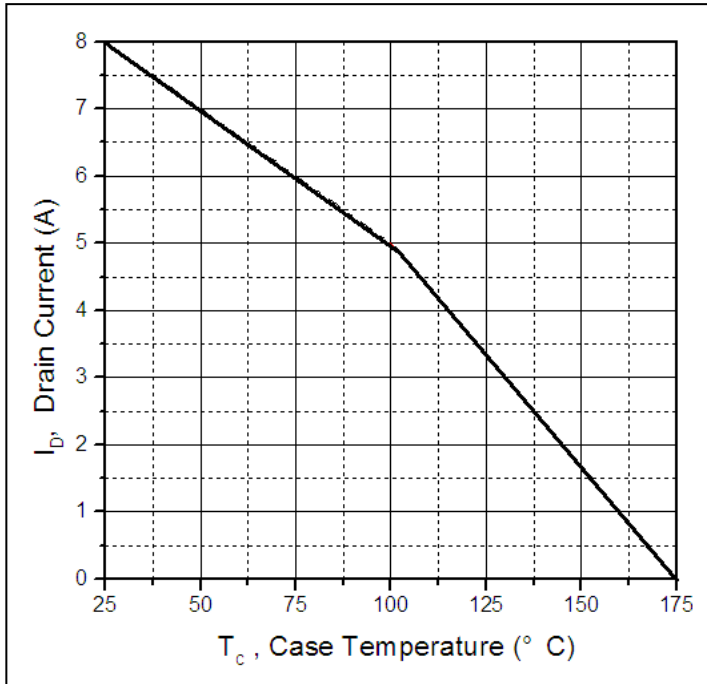
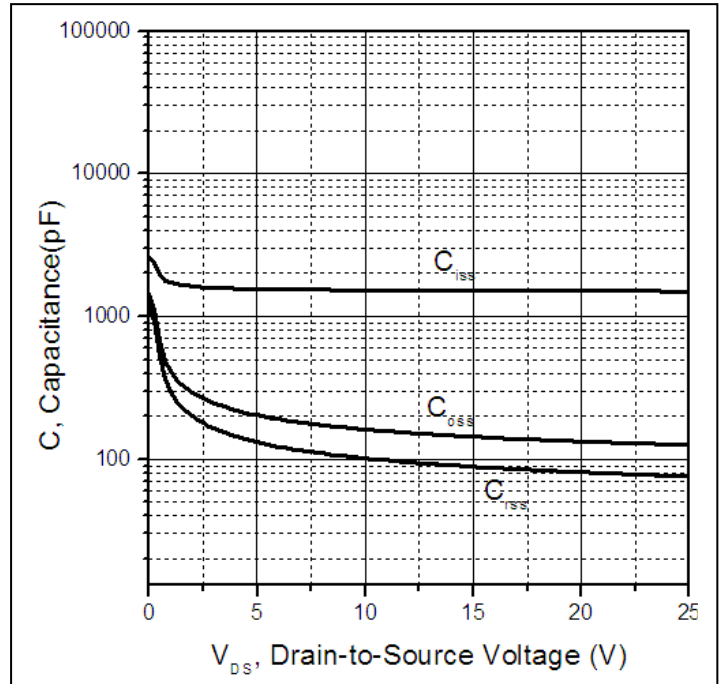
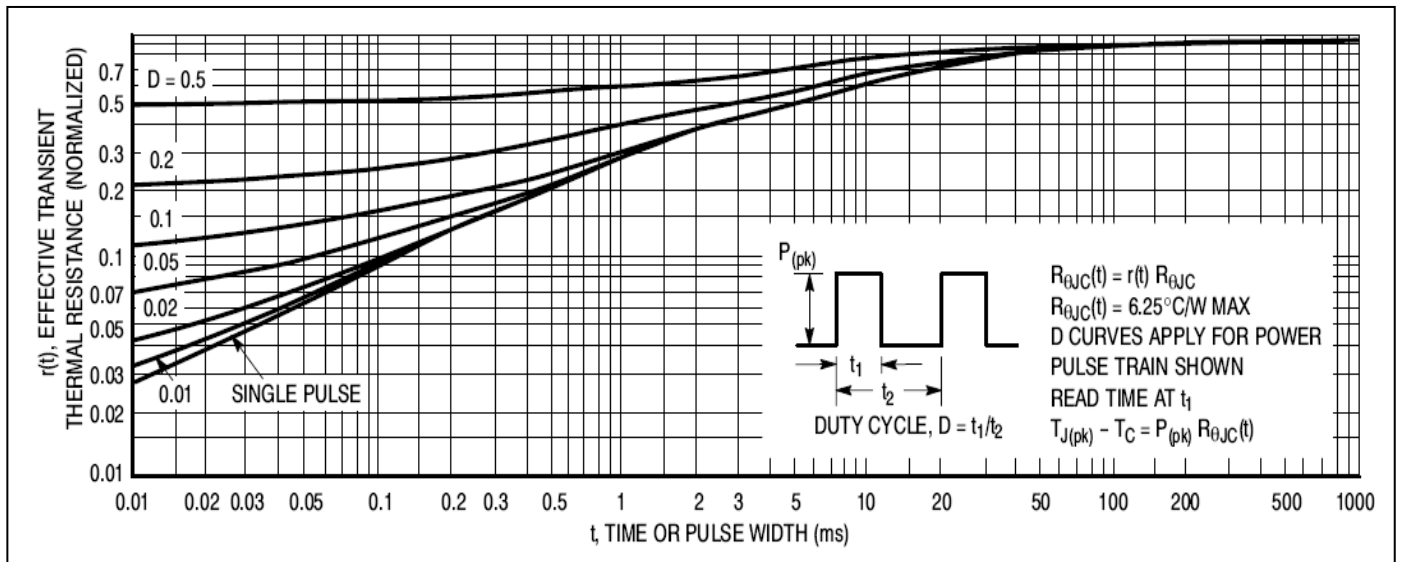
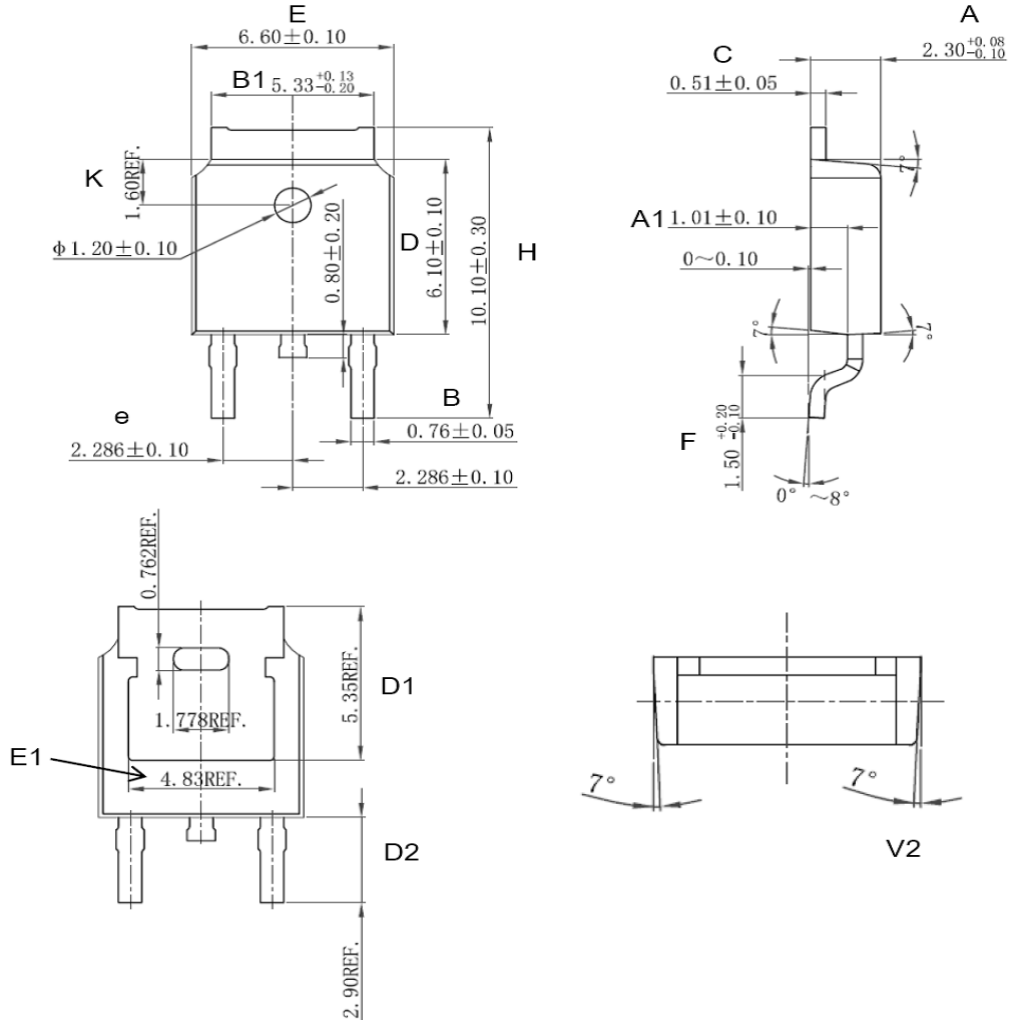


Figure 4: Normalized On-Resistance Vs. Case Temperature

**Typical electrical and thermal characteristics**

**Figure 5. Maximum Drain Current Vs. Case Temperature**

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

**Figure 7. Maximum Effective Transient Thermal Impedance, Junction-to-Case**

**Mechanical Data:**
**DPAK PACKAGE OUTLINE DIMENSION\_CD**


Symbol	Dimension In Millimeters			Dimension In Inches		
	Min	Nom	Max	Min	Nom	Max
A	2.200	2.300	2.380	0.087	0.091	0.094
A1	0.910	1.010	1.110	0.036	0.040	0.044
B	0.710	0.760	0.810	0.028	0.030	0.032
B1	5.130	5.330	5.460	0.202	0.210	0.215
C	0.460	0.510	0.560	0.018	0.020	0.022
D	6.000	6.100	6.200	0.236	0.240	0.244
D1	5.350 (REF)			0.211 (REF)		
D2	2.900 (REF)			0.114 (REF)		
E	6.500	6.600	6.700	0.256	0.260	0.264
E1	4.83 (REF)			0.190 (REF)		
e	2.186	2.286	2.386	0.086	0.090	0.094
H	9.800	10.100	10.400	0.386	0.398	0.409
F	1.400	1.500	1.700	0.055	0.059	0.067
K	1.600 (REF)			0.063 (REF)		
V2	8° (REF)			8° (REF)		

**Ordering and Marking Information**
**Device Marking: SSF1502D**

**Package (Available)**  
**DPAK**  
**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
DPAK	80	50	4000	10	40000

**Reliability Test Program**

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

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