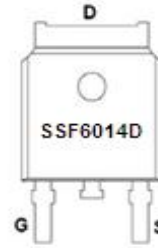
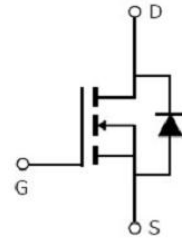


**Main Product Characteristics:**

$V_{DSS}$	60V
$R_{DS(on)}$	12m $\Omega$ (typ.)
$I_D$	60A


**DPAK**

**Marking and pin Assignments**

**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


**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
$I_D @ T_c = 25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	60	A
$I_D @ T_c = 100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10\text{V}$ ①	42	
$I_{DM}$	Pulsed Drain Current ②	240	
$P_D @ T_c = 25^\circ\text{C}$	Power Dissipation ③	115	W
	Linear Derating Factor	0.74	W/ $^\circ\text{C}$
$V_{DS}$	Drain-Source Voltage	60	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$E_{AS}$	Single Pulse Avalanche Energy @ L=0.3mH	235	mJ
$I_{AS}$	Avalanche Current @ L=0.3mH	39	A
$T_J \quad T_{STG}$	Operating Junction and Storage Temperature Range	-55 to + 150	$^\circ\text{C}$

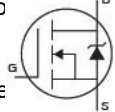
## Thermal Resistance

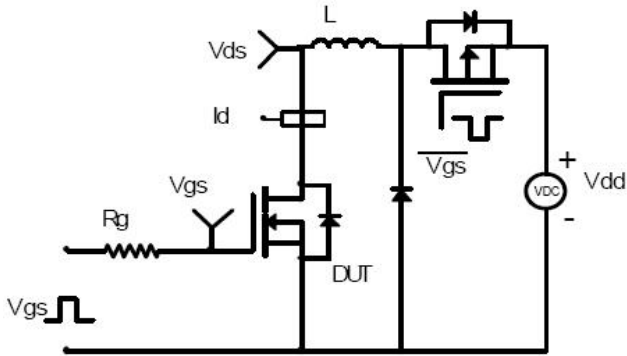
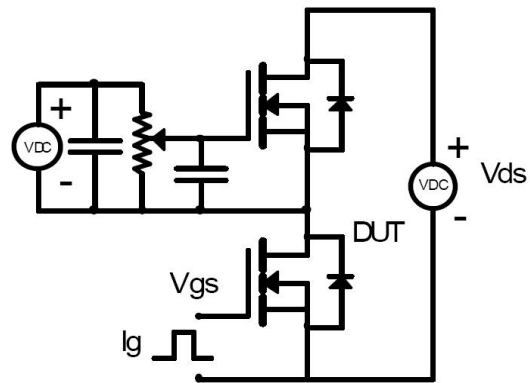
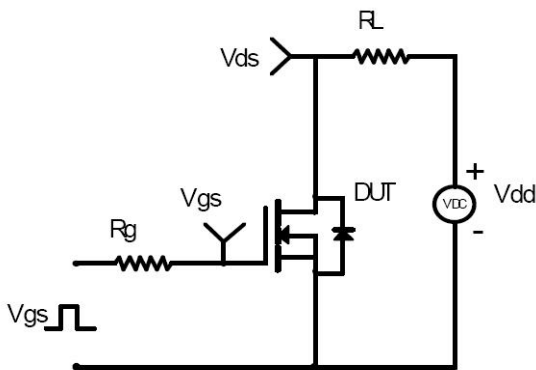
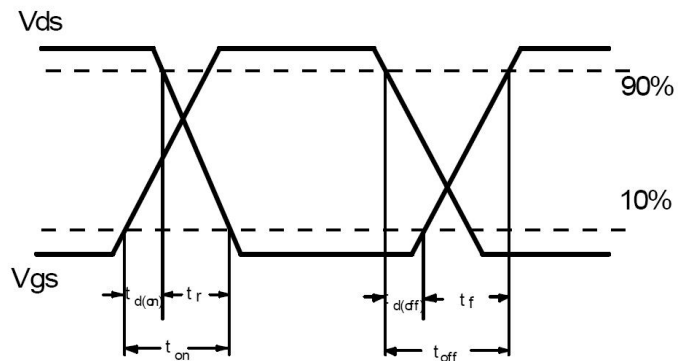
Symbol	Characterizes	Typ.	Max.	Units
R <sub>θJC</sub>	Junction-to-case ③	1.31	—	°C/W
R <sub>θJA</sub>	Junction-to-ambient ④	—	62	°C/W

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

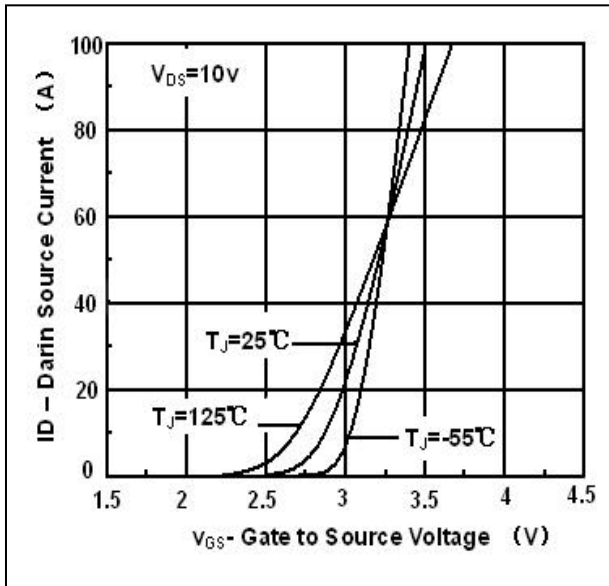
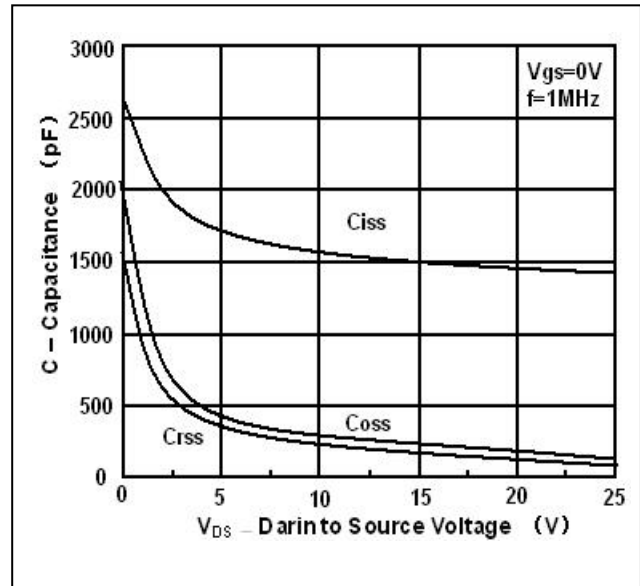
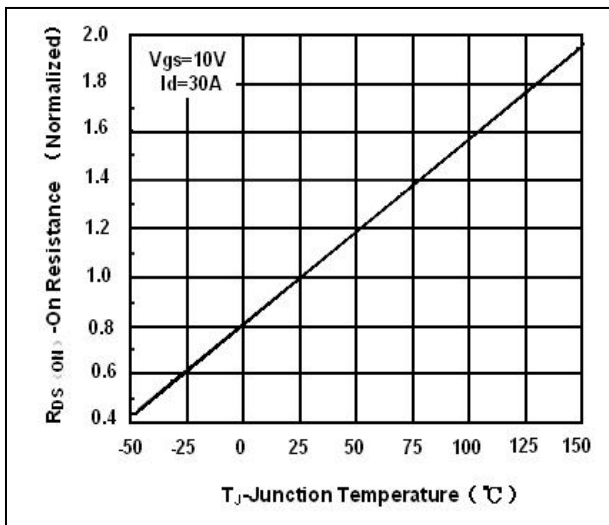
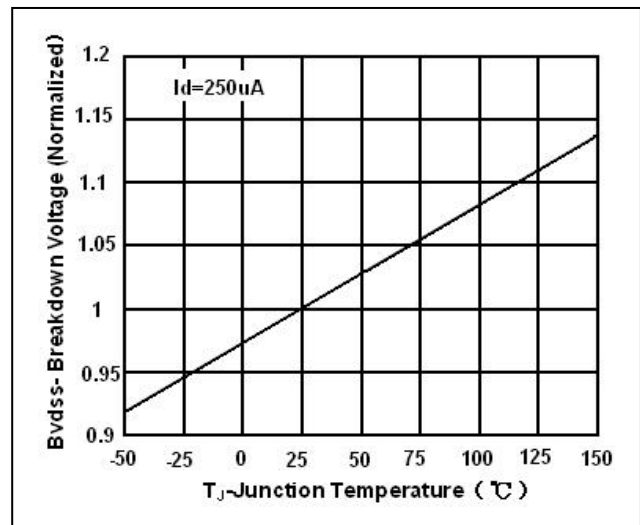
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)DSS</sub>	Drain-to-Source breakdown voltage	60	—	—	V	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA
R <sub>DS(on)</sub>	Static Drain-to-Source on-resistance	—	12	14	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> = 30A
V <sub>GS(th)</sub>	Gate threshold voltage	1.0	—	3.0	V	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA
I <sub>DSS</sub>	Drain-to-Source leakage current	—	—	1	μA	V <sub>DS</sub> = 60V, V <sub>GS</sub> = 0V
I <sub>GSS</sub>	Gate-to-Source forward leakage	—	—	100	nA	V <sub>GS</sub> = 20V
		—	—	-100		V <sub>GS</sub> = -20V
Q <sub>g</sub>	Total gate charge	—	45	—	nC	I <sub>D</sub> = 30A, V <sub>DS</sub> =30V, V <sub>GS</sub> = 10V
Q <sub>gs</sub>	Gate-to-Source charge	—	4	—		
Q <sub>gd</sub>	Gate-to-Drain("Miller") charge	—	15	—		
t <sub>d(on)</sub>	Turn-on delay time	—	14.6	—	ns	V <sub>GS</sub> =10V, V <sub>DS</sub> =30V, R <sub>L</sub> =15Ω, R <sub>GEN</sub> =2.5Ω
t <sub>r</sub>	Rise time	—	14.2	—		
t <sub>d(off)</sub>	Turn-Off delay time	—	40	—		
t <sub>f</sub>	Fall time	—	7.3	—		
C <sub>iss</sub>	Input capacitance	—	1480	—	pF	V <sub>GS</sub> = 0V V <sub>DS</sub> = 25V f = 1MHz
C <sub>oss</sub>	Output capacitance	—	190	—		
C <sub>rss</sub>	Reverse transfer capacitance	—	135	—		

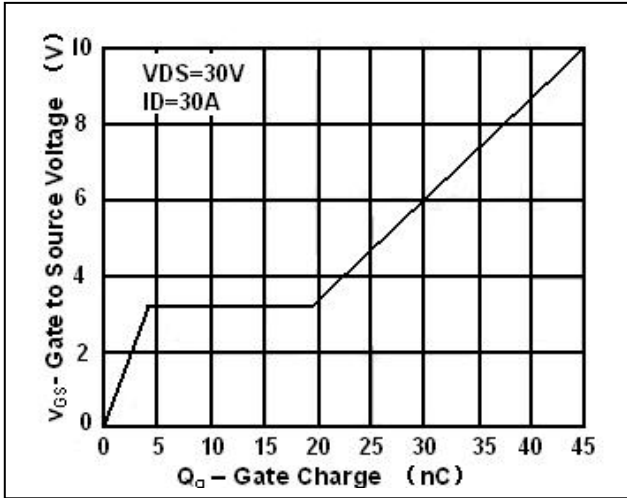
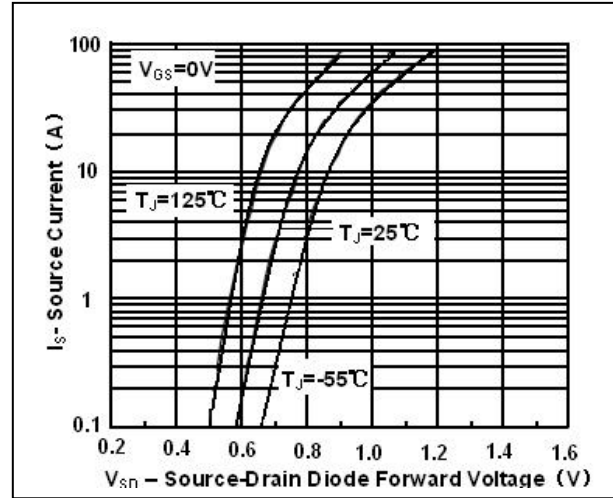
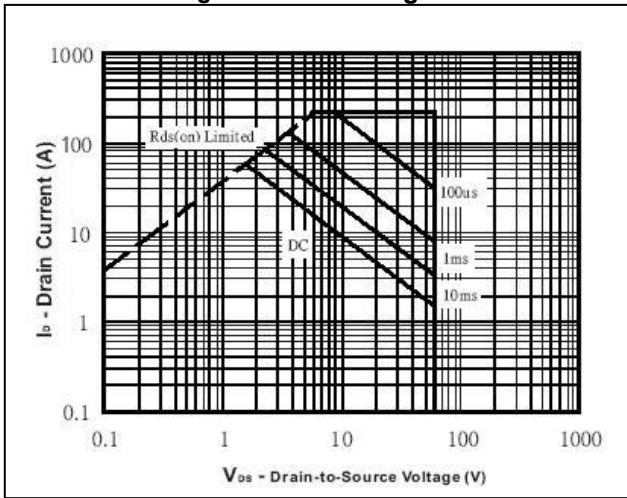
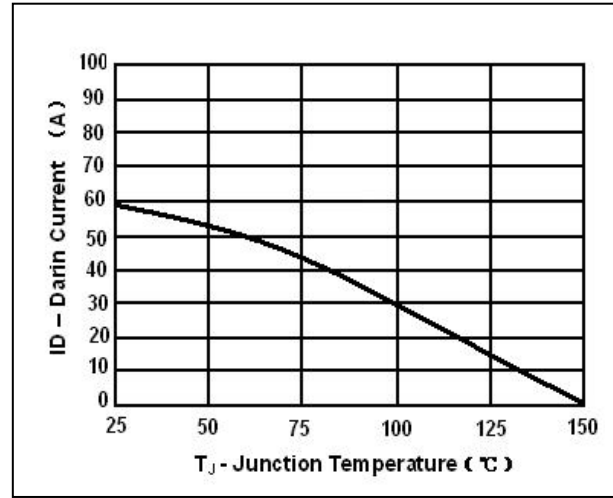
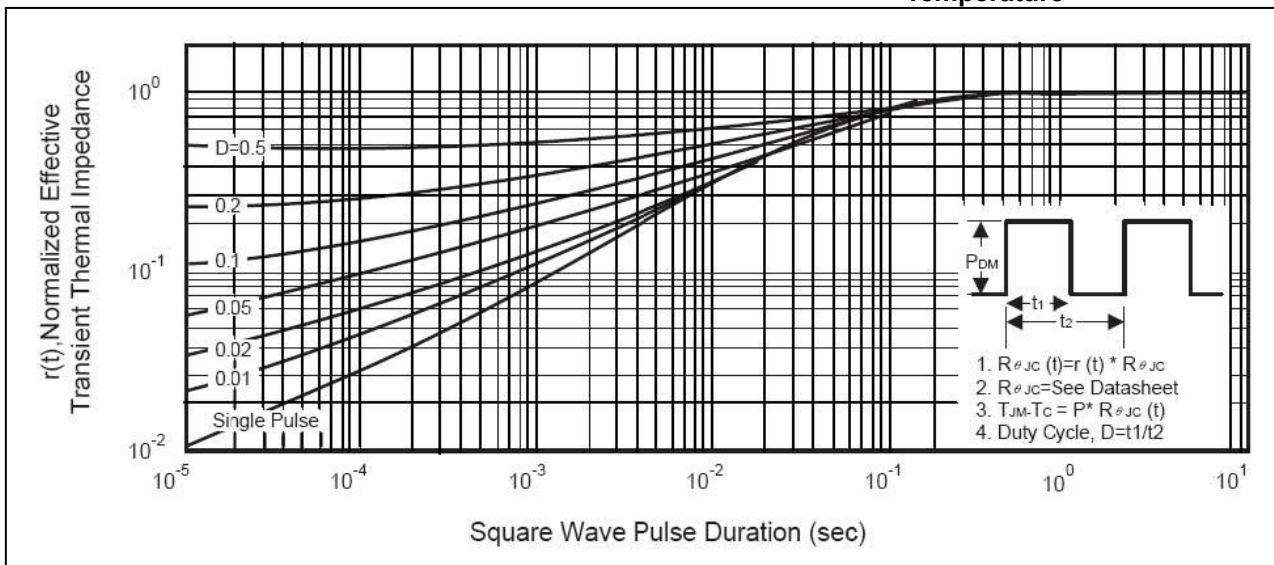
## Source-Drain Ratings and Characteristics

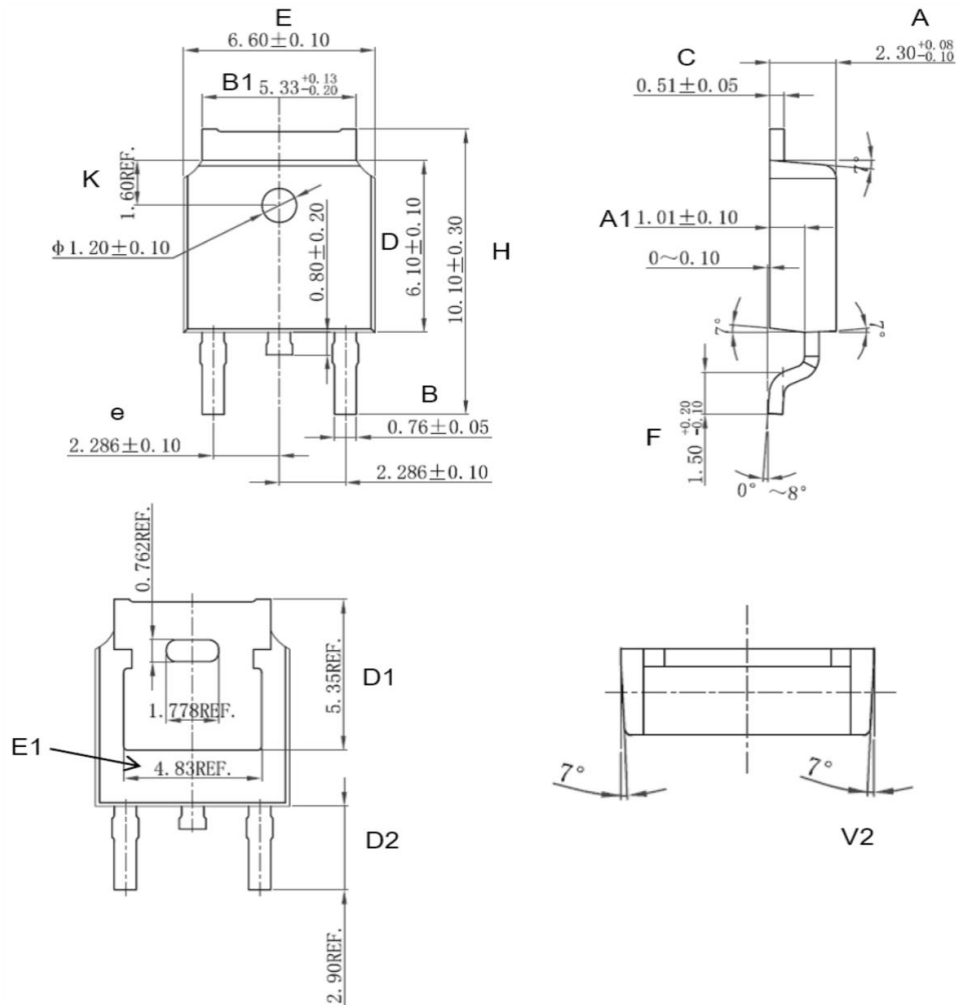
Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
I <sub>S</sub>	Continuous Source Current (Body Diode)	—	—	60	A	MOSFET symb showing the integral reverse p-n junction diode. 
I <sub>SM</sub>	Pulsed Source Current (Body Diode)	—	—	240	A	
V <sub>SD</sub>	Diode Forward Voltage	—	—	1.3	V	I <sub>S</sub> =30A, V <sub>GS</sub> =0V
t <sub>rr</sub>	Reverse Recovery Time	—	33	—	ns	T <sub>J</sub> = 25°C, I <sub>F</sub> =60A,
Q <sub>rr</sub>	Reverse Recovery Charge	—	61	—	nC	di/dt = 100A/μs

**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.
- ② Repetitive rating; pulse width limited by max. junction temperature.
- ③ The power dissipation  $P_D$  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 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25^\circ \text{C}$ .

**Typical Electrical and Thermal Characteristics**

**Figure1. Transfer Characteristic**

**Figure2. Capacitance**

**Figure3. On Resistance vs. Junction Temperature**

**Figure4. Breakdown Voltage vs. Junction Temperature**

**Typical Electrical and Thermal Characteristics**

**Figure 5. Gate Charge**

**Figure 6. Source-Drain Diode Forward Voltage**

**Figure 7. Safe Operation Area**

**Figure 8. Max Drain Current vs. Junction Temperature**

**Figure 9. Transient Thermal Impedance Curve**

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


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)		

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