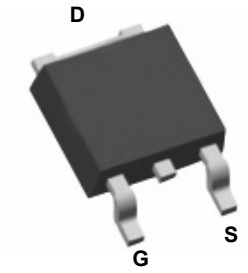
GOOD-ARK SEMICONDUCTOR

SSFD6025B

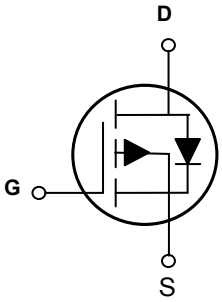
60V P-Channel MOSFET

Main Product Characteristics

V_{DSS}	-60V
$R_{DS(ON)}$	12mΩ (typ.)
I_D	-60A



TO-252 (DPAK)



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for PWM, load switching and general purpose applications
- Ultra low on-resistance with low gate charge
- High power and current handing capability
- Fully avalanche rated

Description

The SSFD6025B utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supply and a wide variety of other applications.

Absolute Maximum Ratings

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25°C), V_{GS}=10V[1]	I_D	-60	A
Drain Current-Continuous (T_C=100°C), V_{GS}=10V[1]		-50	A
Drain Current-Pulsed[2]	I_{DM}	-240	A
Pulsed Source Current (Body Diode)[2]	I_{SM}	-240	A
Maximum Power Dissipation (T_C=25°C)[3]	P_D	166	W
Single Pulse Avalanche Energy (L=0.3mH)	E_{AS}	300	mJ
Single Pulse Avalanche Current (L=0.3mH)	I_{AS}	44	A
Junction-to-Ambient (t ≤ 10s)[4]	$R_{\theta JA}$	62	°C/W
Maximum Junction-to-Case[5]	$R_{\theta JC}$	0.75	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250uA	-60	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=-60V, V_{GS}=0V	-	-	-1	μA
Drain-to-Source Leakage Current		V_{DS}=-60V, V_{GS}=0V T_J=125°C	-	-	-50	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=-250uA	-1.0	-	-3	V
Drain Static-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=-60V, I_D=-23A	-	12	25	mΩ
		V_{GS}=-60V, I_D=-23A T_J=125°C	-	22	-	mΩ
Dynamic and Switching Characteristics						
Total Gate Charge	Q_g	V_{DD}=-40V, I_D=-30A V_{GS}=-10V	-	-	170	nC
Gate-Source Charge	Q_{gs}		-	-	30	
Gate-Drain Charge	Q_{gd}		-	-	70	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-30V, R_G=3Ω R_L=1.5Ω, V_{GS}=-10V, I_D=-20A	-	15.2	-	nS
Rise Time	t_r		-	23.7	-	
Turn-Off Delay Time	$t_{d(off)}$		-	53.3	-	
Fall Time	t_f		-	12.7	-	
Input Capacitance	C_{lss}	V_{DS}=-25V, V_{GS}=0V, F=1MHz	-	7456	-	pF
Output Capacitance	C_{oss}		-	376	-	
Reverse Transfer Capacitance	C_{rss}		-	293	-	
Source-Drain Ratings and Characteristics						
Maximum Body-Diode Continuous Current	I_S	MOSFET symbol showing the integral reverse p-n junction diode.	-	-60	-	A
Maximum Body-Diode Pulse Current	I_{SM}		-	-240	-	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-10A, T_J=25°C	-	-0.74	-1.2	V
Reverse Recovery Time	t_{rr}	I_F=-20A di/dt=100A/μs T_J=25°C	-	38.2	-	nS
Reverse Recovery Charge	Q_{rr}		-	62.5	-	nC

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°C

Test Circuits and Waveforms

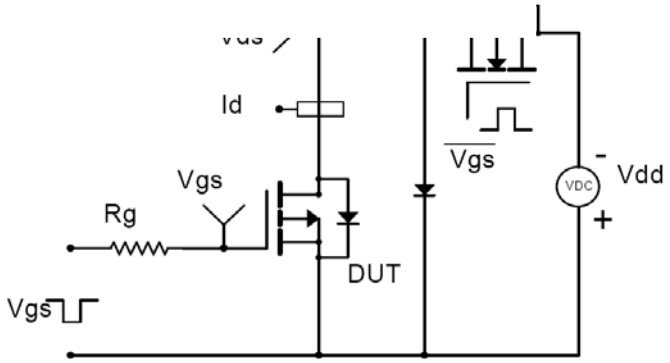


Figure 1. EAS Test Circuit

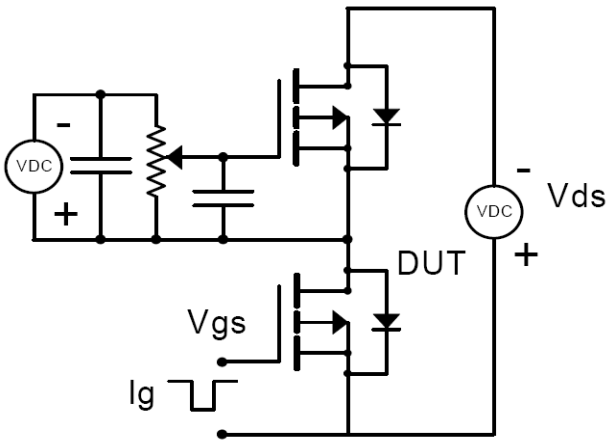


Figure 2. Gate Charge Test Circuit

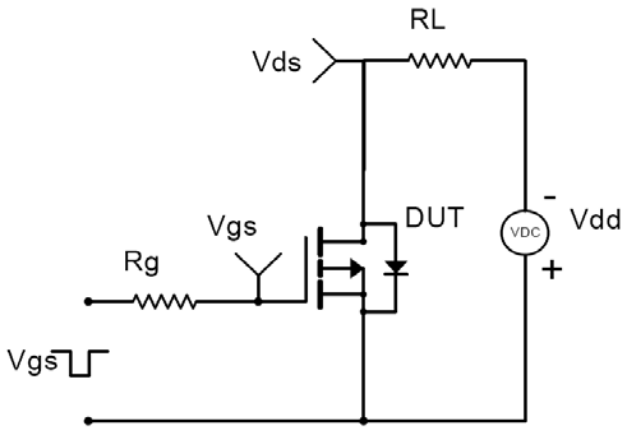


Figure 3. Switching Time Test Circuit

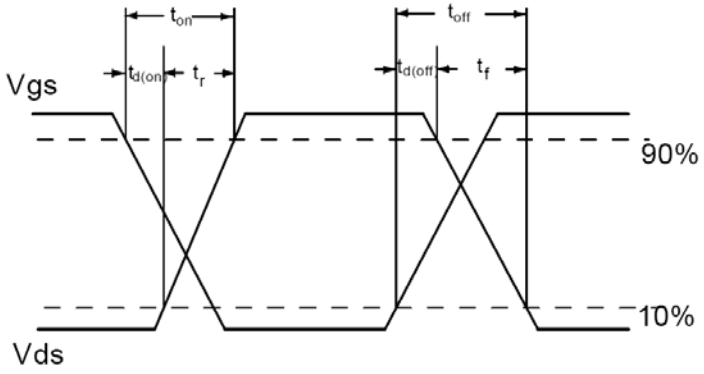
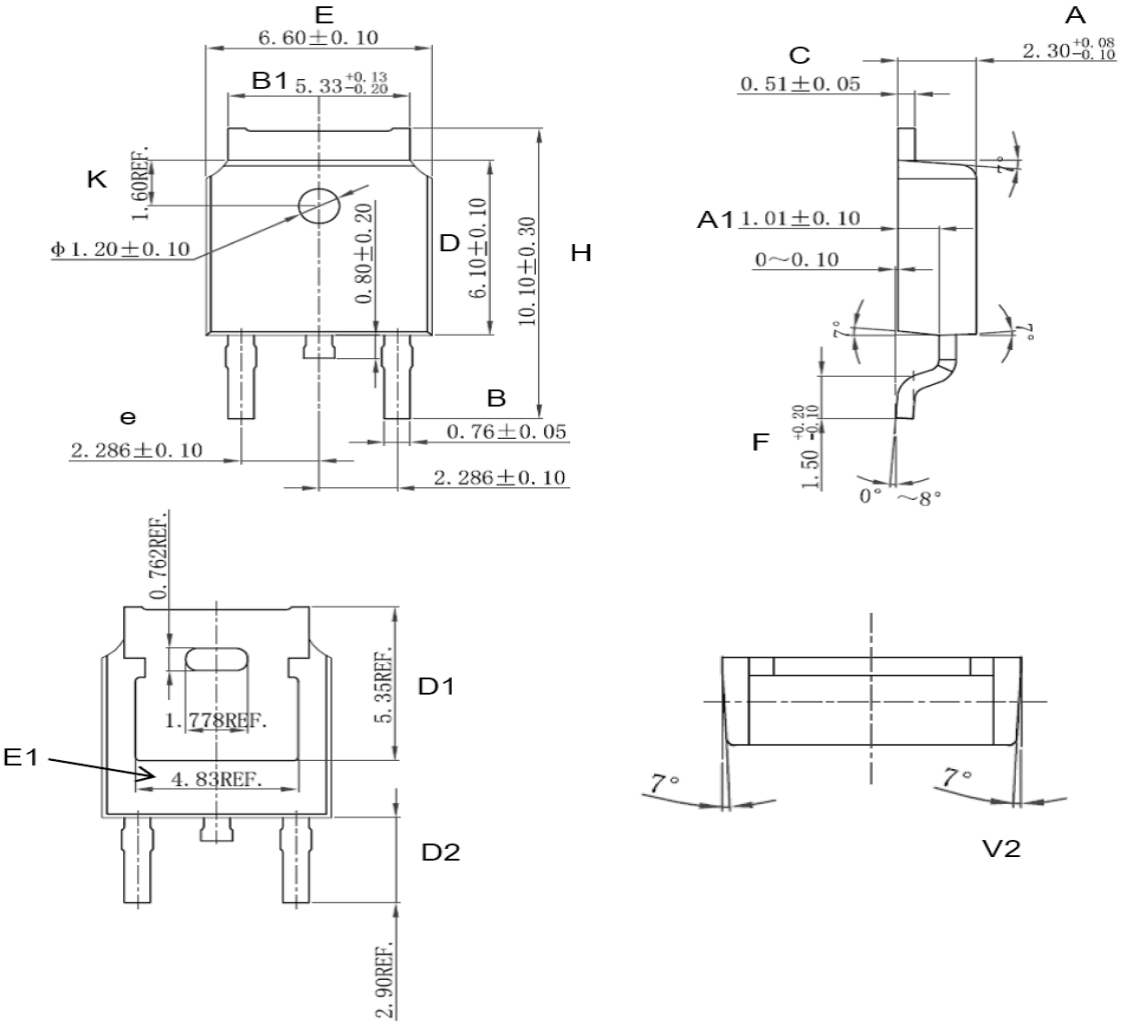


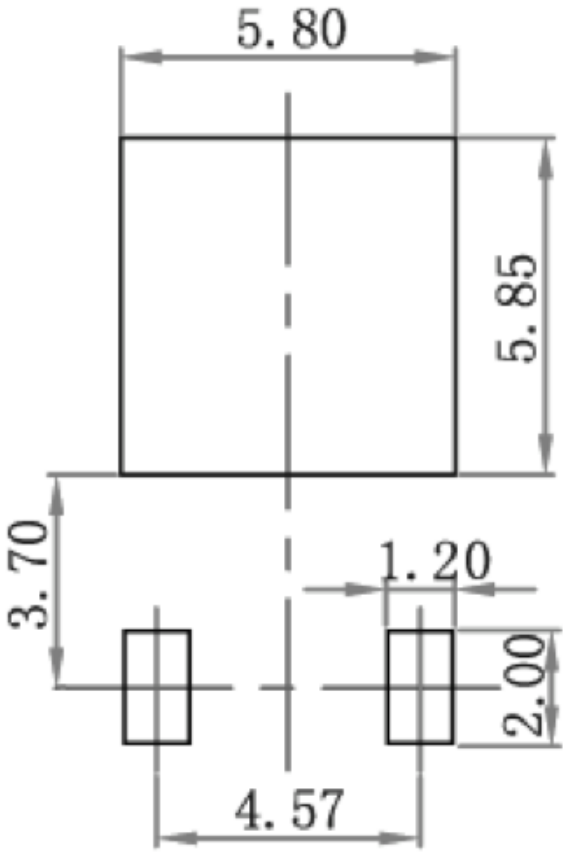
Figure 4. Switching Waveforms

Package Outline Dimensions (TO-252/DPAK)



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)		

Recommended Pad Layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:± 0.05mm.
3.The pad layout is for reference purposes only.