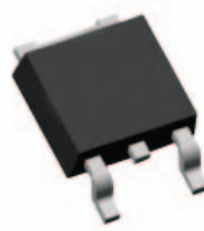
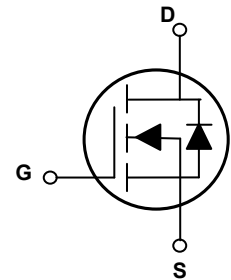


### Main Product Characteristics

$V_{DS}$	650V
$R_{DS(ON)}$	360m $\Omega$
$I_D$	11A



TO-252(DPAK)



Schematic Diagram

### Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

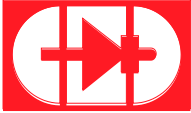


### Description

The GSJD6512 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 ( $T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	650	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Drain Current-Continuous ( $T_C=25^{\circ}\text{C}$ )	$I_D$	11	A
Drain Current-Continuous ( $T_C=100^{\circ}\text{C}$ )		6.9	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	44	A
Single Pulse Avalanche Energy	$E_{AS}$	210	mJ
Power Dissipation ( $T_C=25^{\circ}\text{C}$ )	$P_D$	75	W
Power Dissipation-Derate above 25 $^{\circ}\text{C}$		0.60	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	$^{\circ}\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.65	$^{\circ}\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^{\circ}\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^{\circ}\text{C}$

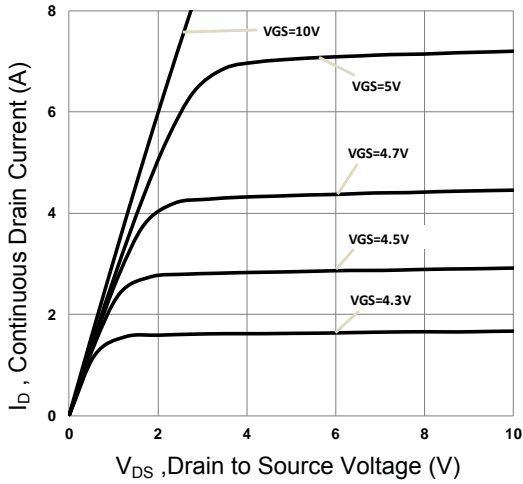

**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=1mA$	650	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$V_{DS}=520V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	-	10	
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 30V, V_{DS}=0V$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4A$	-	320	360	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu\text{A}$	2	3	4	V
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=480V, I_D=6A, V_{GS}=10V$	-	21	32	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	4	6	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	7	11	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=480V, R_G=25\Omega, V_{GS}=10V, I_D=6A$	-	18	27	nS
Rise Time <sup>2,3</sup>	$t_r$		-	41	62	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	110	165	
Fall Time <sup>2,3</sup>	$t_f$		-	39	59	
Input Capacitance	$C_{iss}$	$V_{DS}=100V, V_{GS}=0V, F=1\text{MHz}$	-	670	1005	pF
Output Capacitance	$C_{oss}$		-	30	45	
Reverse Transfer Capacitance	$C_{rss}$		-	1.5	5.3	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	20	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V, \text{Force Current}$	-	-	11	A
Pulsed Source Current	$I_{SM}$		-	-	22	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=6A, T_J=25^\circ\text{C}$	-	-	1.4	V
Reverse Recovery Time <sup>2</sup>	$t_{rr}$	$V_R=400V, I_S=10A, di/dt=100A/\mu\text{s}, T_J=25^\circ\text{C}$	-	320	-	nS
Reverse Recovery Charge <sup>2</sup>	$Q_{rr}$		-	3.8	-	$\mu\text{C}$

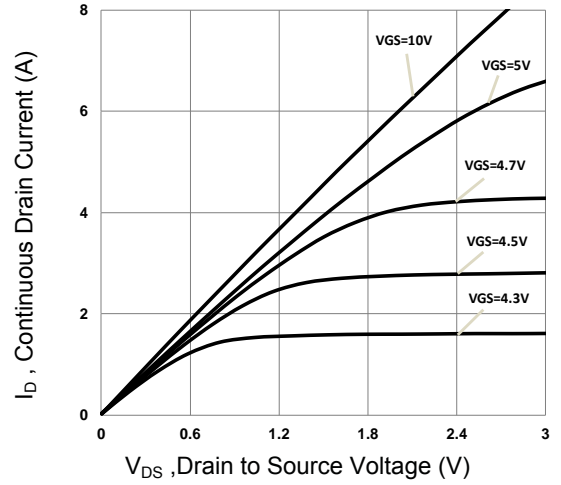
Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operation temperature.

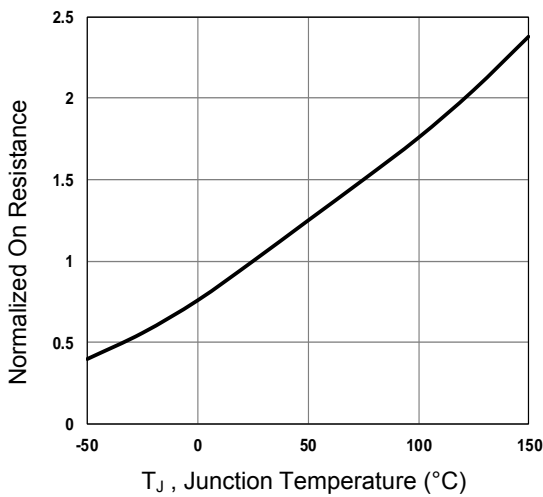
**Typical Electrical and Thermal Characteristic Curves**



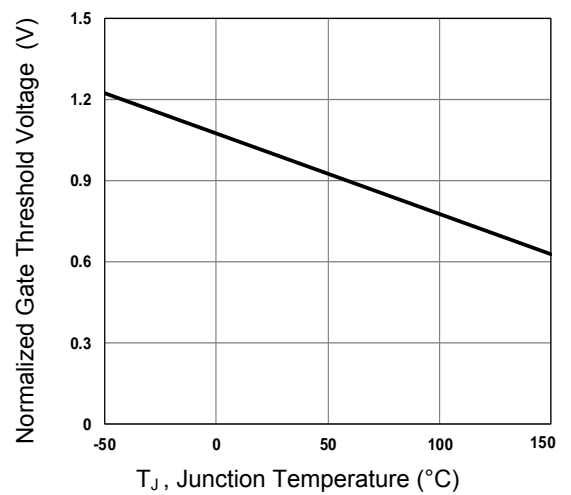
**Figure 1. Typical Output Characteristics**



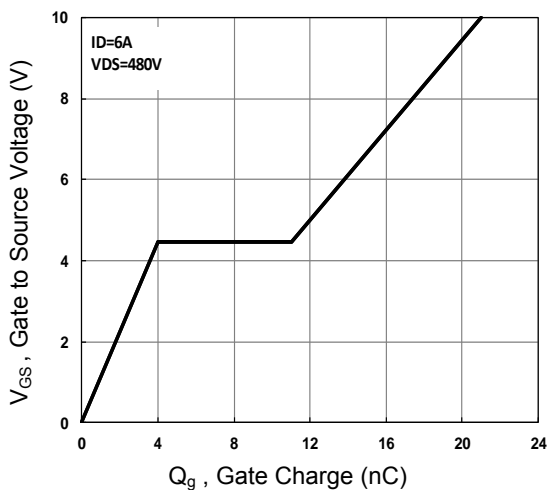
**Figure 2. Typical Output Characteristics**



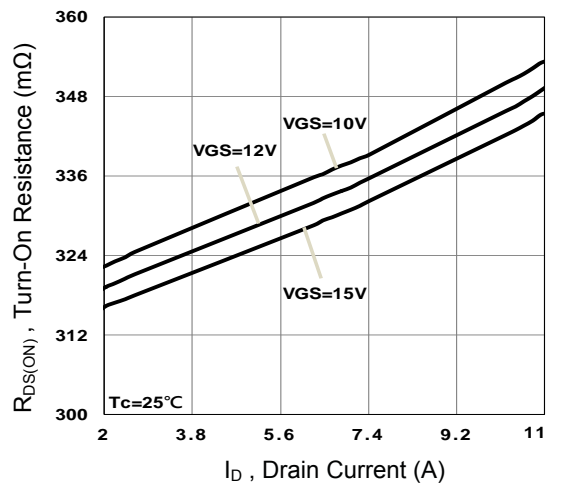
**Figure 3. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



**Figure 4. Normalized  $V_{th}$  vs.  $T_J$**

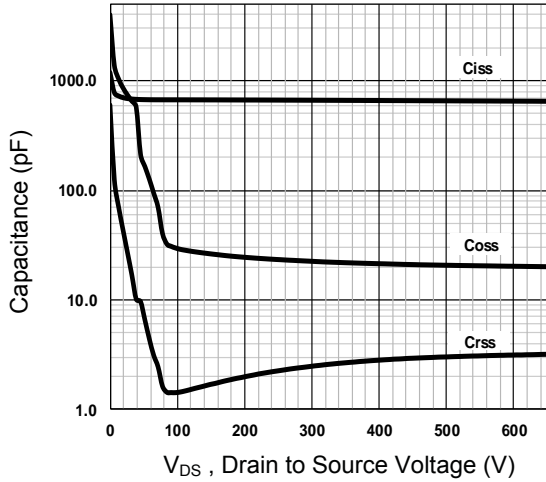


**Figure 5. Gate Charge Waveform**

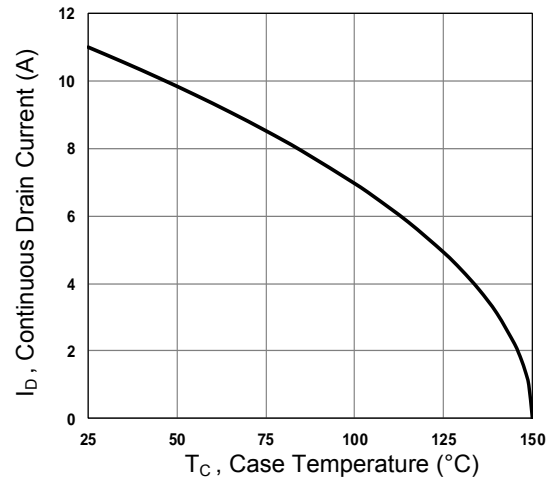


**Figure 6. Turn-On Resistance vs.  $I_D$**

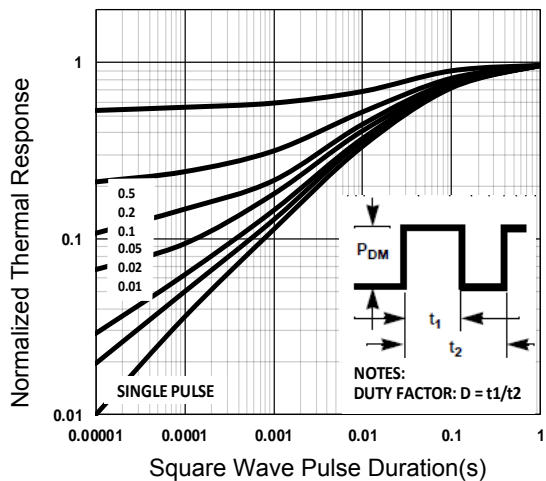
**Typical Electrical and Thermal Characteristic Curves**



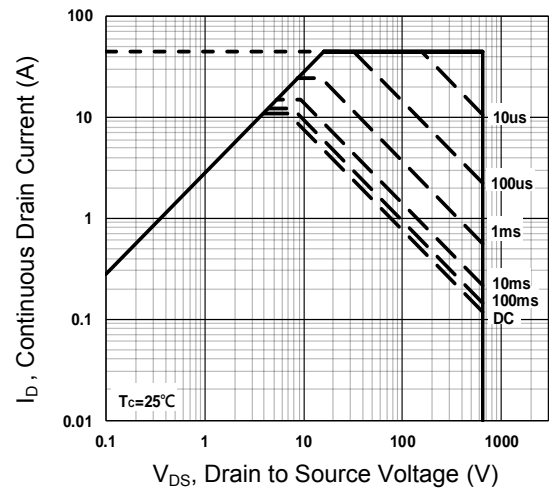
**Figure 7. Capacitance Characteristics**



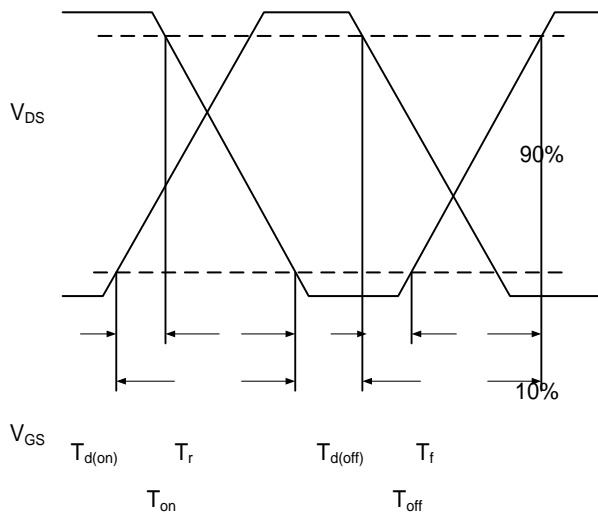
**Figure 8. Continuous Drain Current vs. T<sub>C</sub>**



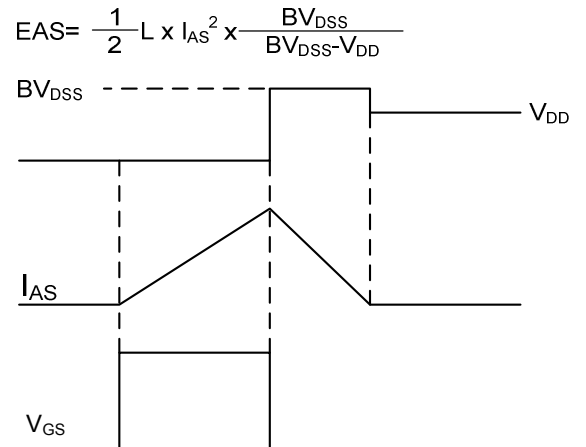
**Figure 9. Normalized Transient Impedance**



**Figure 10. Maximum Safe Operation Area**

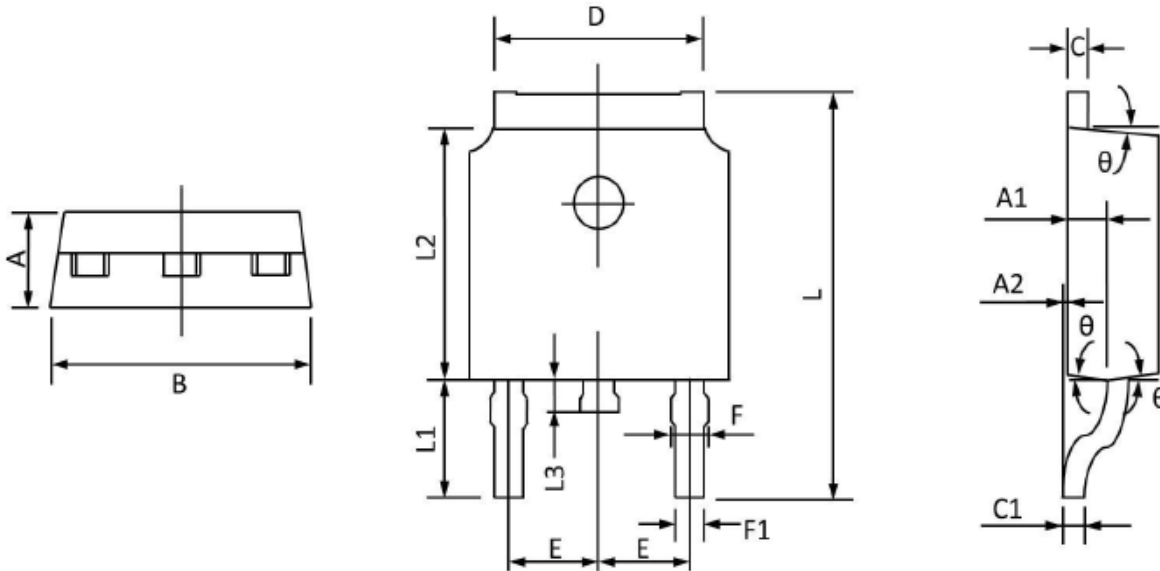


**Figure 11. Switching Time Waveform**



**Figure 12. EAS Waveform**

**Package Outline Dimensions (TO-252)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.450	2.150	0.096	0.085
A1	1.200	0.910	0.047	0.036
A2	0.150	0.000	0.006	0.000
B	6.800	6.300	0.268	0.248
C	0.580	0.350	0.023	0.014
C1	0.550	0.380	0.022	0.015
D	5.500	5.100	0.217	0.201
E	2.390	2.000	0.094	0.079
F	0.940	0.600	0.037	0.024
F1	0.860	0.500	0.034	0.020
L	10.400	9.400	0.409	0.370
L1	3.000	2.400	0.118	0.094
L2	6.200	5.300	0.244	0.209
L3	1.200	0.600	0.047	0.024
θ	9°	3°	9°	3°