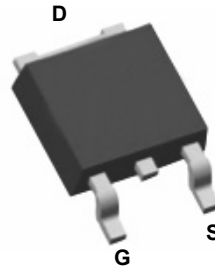
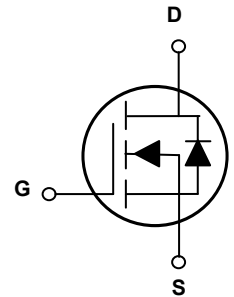


### Main Product Characteristics

$V_{DS}$	650V
$R_{DS(ON)}$	750m $\Omega$
$I_D$	5A



TO-252



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 GSJD6505 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 ( $T_C=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	650	V
Gate-Source Voltage, AC ( $f>1$ Hz)	$V_{GS}$	$\pm 30$	V
Drain Current-Continuous ( $T_C=25^{\circ}C$ )	$I_D$	5	A
Drain Current-Continuous ( $T_C=100^{\circ}C$ )		3	A
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	20	A
Power Dissipation ( $T_C=25^{\circ}C$ )	$P_D$	46	W
Power Dissipation-Derate Above $25^{\circ}C$		0.37	W/ $^{\circ}C$
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	52	mJ
Avalanche Current <sup>1</sup>	$I_{AR}$	0.9	A
Repetitive Avalanche Energy , $t_{AR}$ Limited by $T_{jmax}$ <sup>1</sup>	$E_{AR}$	0.14	mJ
Drain Source Voltage Slope, $V_{DS} \leq 480$ V,	dv/dt	50	V/nS
Reverse Diode dv/dt, $V_{DS} \leq 480$ V, $I_{SD}<I_D$	dv/dt	15	V/nS
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.72	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	75	$^{\circ}C/W$
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To +150	$^{\circ}C$

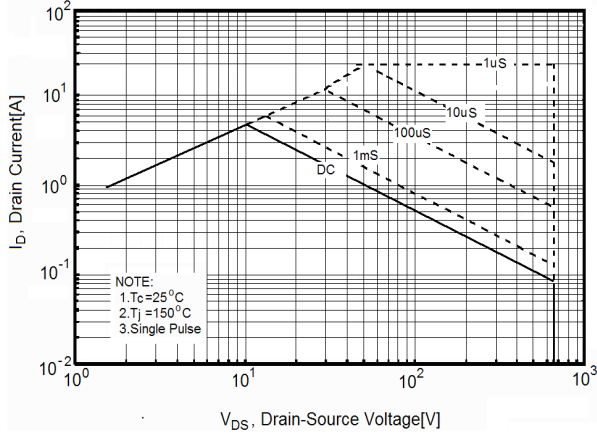
**Electrical Characteristics** ( $T_A=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	650	-	-	V
Zero Gate Voltage Drain Current ( $T_C=25^\circ\text{C}$ )	$I_{DSS}$	$V_{DS}=650V, V_{GS}=0V$	-	-	1	$\mu A$
Zero Gate Voltage Drain Current ( $T_C=125^\circ\text{C}$ )		$V_{DS}=650V, V_{GS}=0V$	-	-	50	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3	-	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=2.5A$	-	750	900	m $\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=50V, V_{GS}=0V, F=1.0MHz$	-	370	-	PF
Output Capacitance	$C_{oss}$		-	25	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	0.5	-	PF
Total Gate Charge	$Q_g$	$V_{DS}=480V, I_D=5A, V_{GS}=10V$	-	10.5	15	nC
Gate-Source Charge	$Q_{gs}$		-	2.6	-	nC
Gate-Drain Charge	$Q_{gd}$		-	5.3	-	nC
<b>Switching Characteristics</b>						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=380V, I_D=3A, V_{GS}=10V, R_G=5\Omega$	-	7	-	nS
Turn-On Rise Time	$t_r$		-	3	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	52	62	nS
Turn-Off Fall Time	$t_f$		-	10	16	nS
<b>Source-Drain Diode Characteristics</b>						
Source-Drain Current(Body Diode)	$I_{SD}$	$T_C=25^\circ$	-	-	5	A
Pulsed Source-Drain Current (Body Diode)	$I_{SDM}$		-	-	20	A
Forward On Voltage	$V_{SD}$	$T_J=25^\circ\text{C}, I_{SD}=5A, V_{GS}=0V$	-	0.9	1.2	V
Reverse Recovery Time	$t_{rr}$	$T_J=25^\circ\text{C}, I_F=2.5A, di/dt=100A/\mu s$	-	210	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	0.66	-	nC
Peak Reverse Recovery Current	$I_{rrm}$		-	6.5	-	A

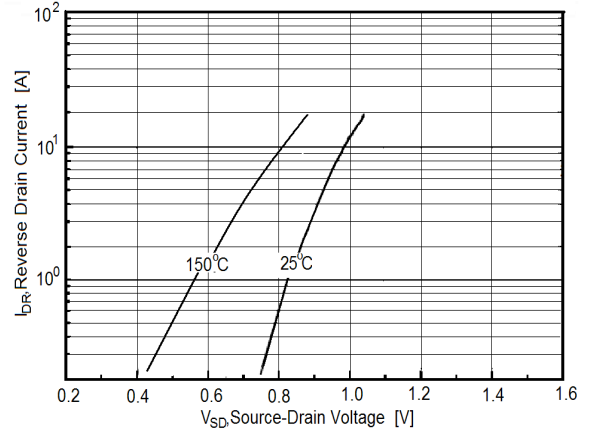
Notes: 1.Repetitive Rating: Pulse width limited by maximum junction temperature

2.  $T_J=25^\circ\text{C}, V_{DD}=50V, V_G=10V, R_G=25\Omega, L=73mH$

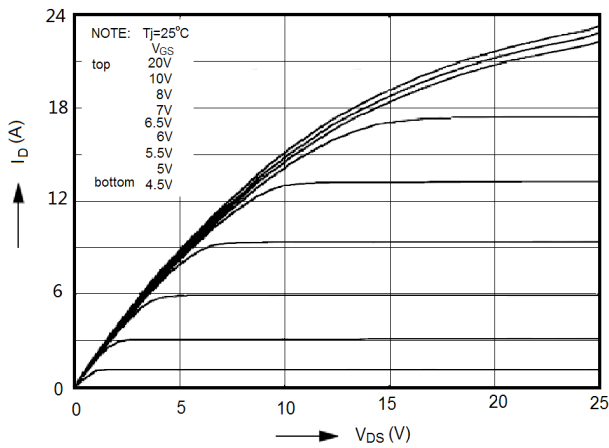
**Typical Electrical and Thermal Characteristic Curves**



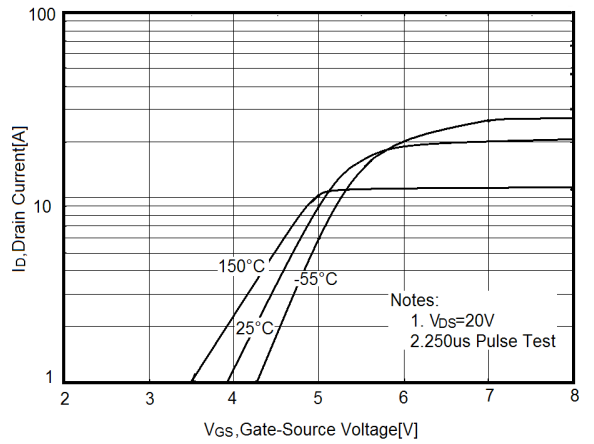
**Figure 1. Safe Operation Area**



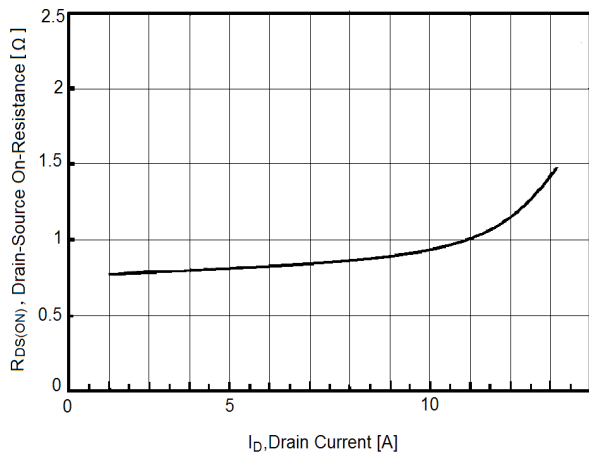
**Figure 2. Source-Drain Diode Forward**



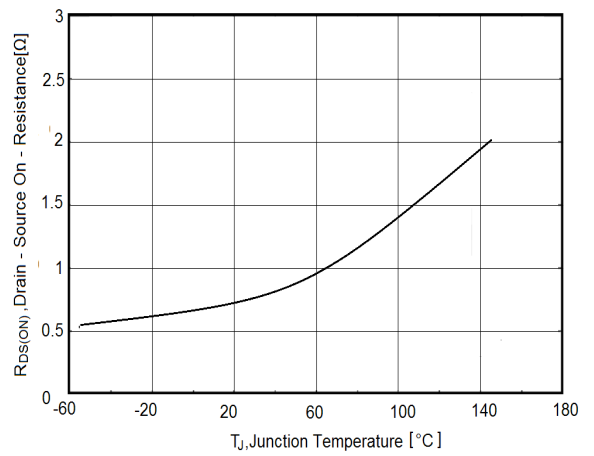
**Figure 3. Output Characteristics**



**Figure 4. Transfer Characteristics**

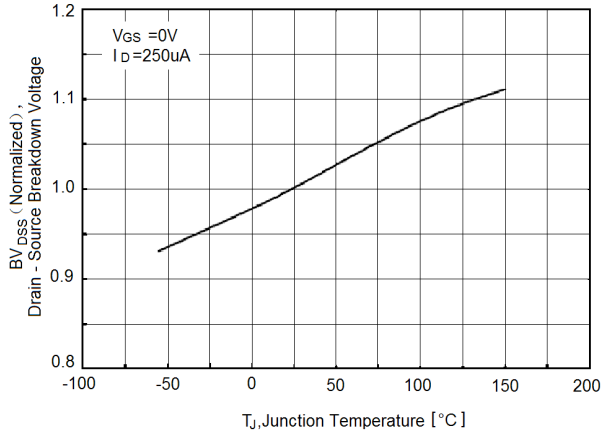


**Figure 5. Static Drain-Source On Resistance**

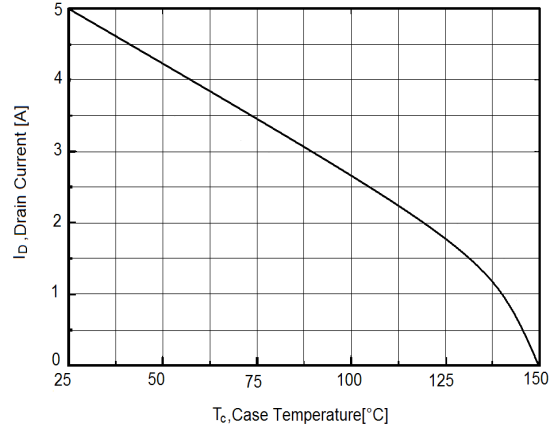


**Figure 6.  $R_{DS(ON)}$  vs Junction Temperature**

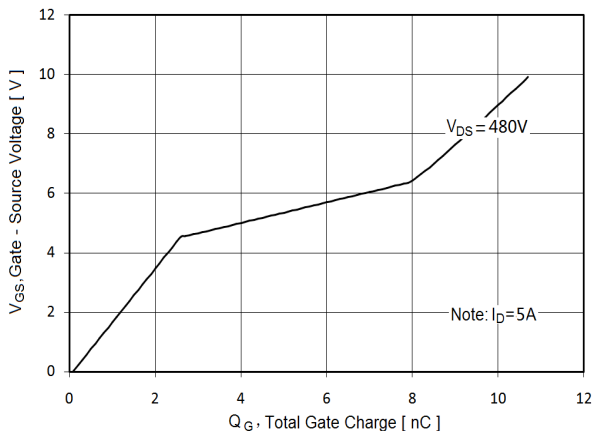
**Typical Electrical and Thermal Characteristic Curves**



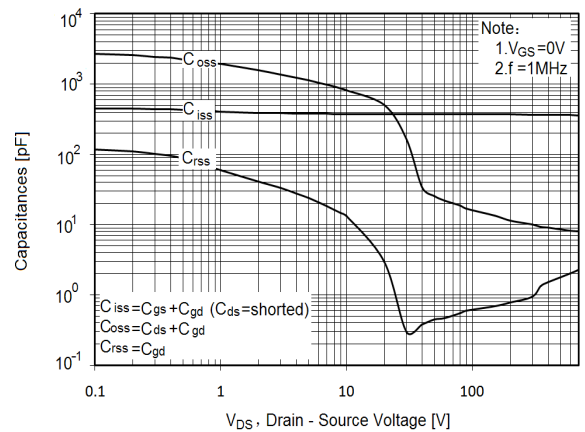
**Figure 7.  $BV_{DSS}$  vs Junction Temperature**



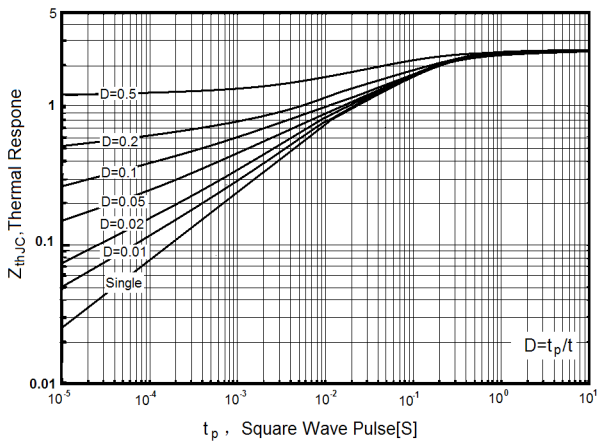
**Figure 8. Maximum  $I_D$  vs Junction Temperature**



**Figure 9. Gate Charge Waveforms**

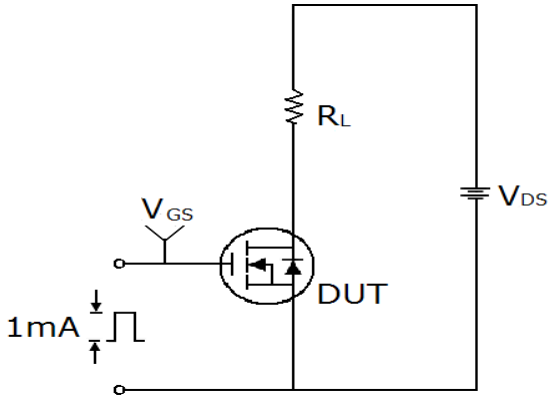


**Figure 10. Capacitance**

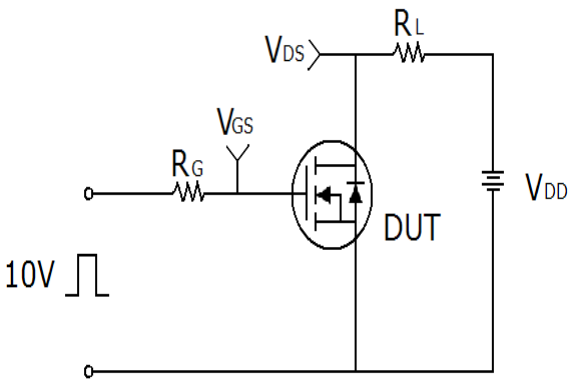
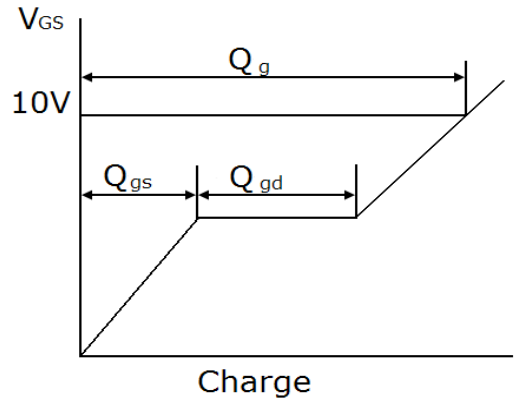


**Figure 11. Transient Thermal Impedance**

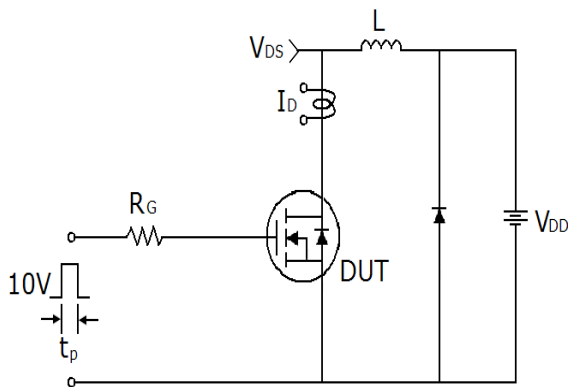
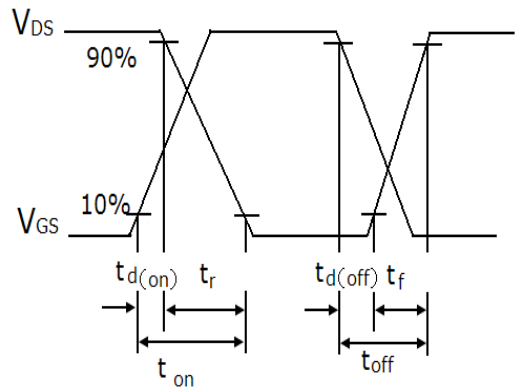
**Typical Electrical and Thermal Characteristic Curves**



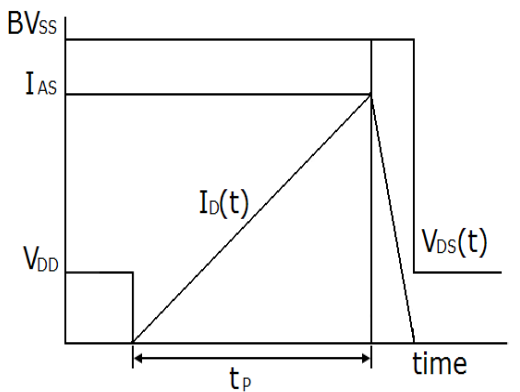
**Figure 12. Gate Charge Test Circuit & Waveform**



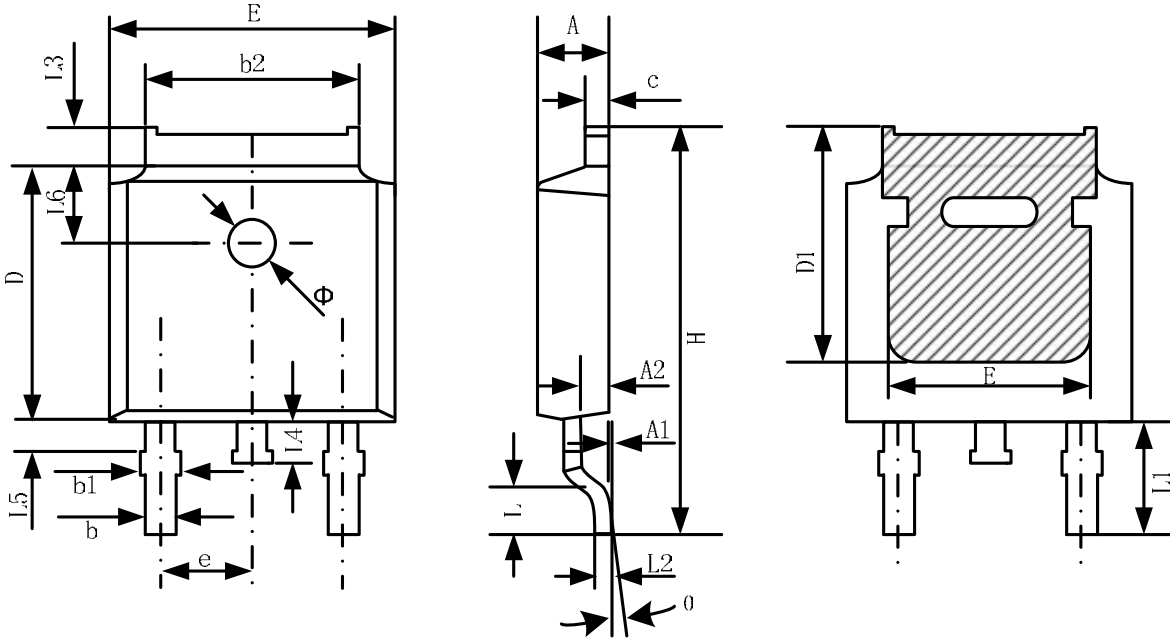
**Figure 13. Switch Time Test Circuit**



**Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms**



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



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.38	0.087	0.094
A1	0.00	0.10	0.000	0.004
A2	0.90	1.10	0.035	0.043
b	0.72	0.85	0.028	0.033
b1	0.72	0.90	0.028	0.035
b2	5.13	5.46	0.202	0.215
c	0.47	0.60	0.019	0.024
D	6.00	6.20	0.236	0.244
D1	5.25	--	0.207	--
E	6.50	6.70	0.256	0.264
E1	4.70	--	0.185	--
e	2.19	2.39	0.086	0.094
H	9.80	10.40	0.386	0.409
L	1.40	1.70	0.055	0.067
L1	2.90 REF		0.114 REF	
L2	0.508 BSC		0.020 BSC	
L3	0.90	1.25	0.035	0.049
L4	0.60	1.00	0.024	0.039
L5	0.15	0.75	0.006	0.030
L6	1.80 REF		0.071	
Φ	1.20	1.40	0.047	0.055
θ	0°	8°	0°	8°