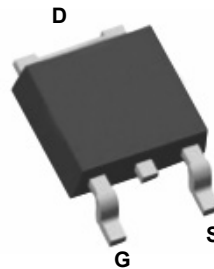
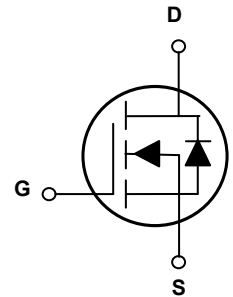


Main Product Characteristics

V_{DS}	650V
$R_{DS(ON)}$	750mΩ
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 ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

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

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	650	-	-	V
Zero Gate Voltage Drain Current (T _C =25°C)	I _{DSS}	V _{DS} =650V, V _{GS} =0V	-	-	1	μA
Zero Gate Voltage Drain Current (T _C =125°C)		V _{DS} =650V, V _{GS} =0V	-	-	50	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	3	-	4	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2.5A	-	750	900	mΩ
Dynamic Characteristics						
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
Switching Characteristics						
Turn-On Delay Time	t _{d(on)}	V _{DD} =380V, I _D =3A V _{GS} =10V, R _G =5Ω	-	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
Source-Drain Diode Characteristics						
Source-Drain Current(Body Diode)	I _{SD}	T _C =25°	-	-	5	A
Pulsed Source-Drain Current (Body Diode)	I _{SDM}		-	-	20	A
Forward On Voltage	V _{SD}	T _J =25°C, I _{SD} =5A, V _{GS} =0V	-	0.9	1.2	V
Reverse Recovery Time	t _{rr}	T _J =25°C, I _F =2.5A, di/dt=100A/μs	-	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

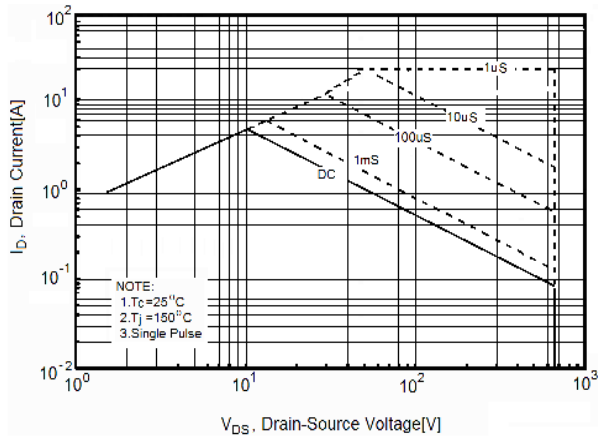


Figure 1. Safe Operation Area

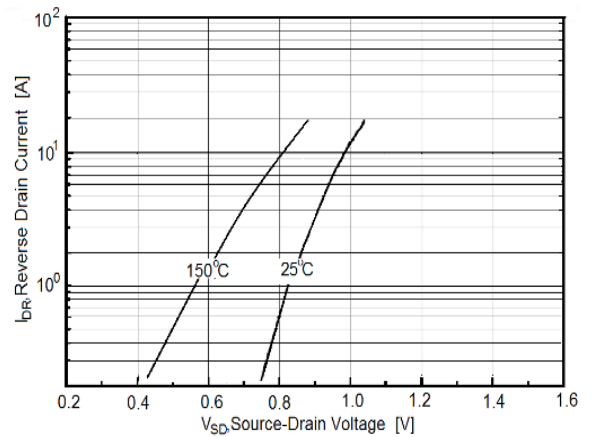


Figure 2. Source-Drain Diode Forward

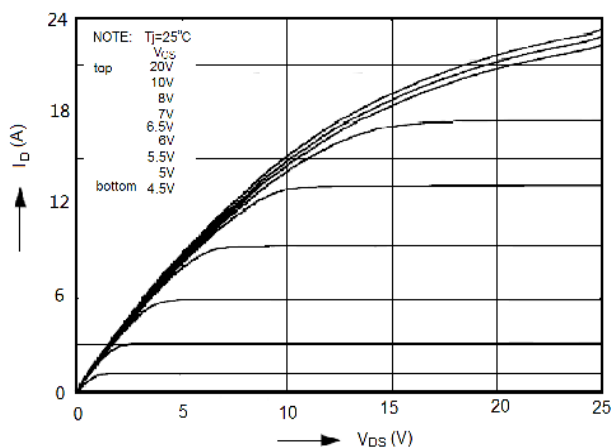


Figure 3. Output Characteristics

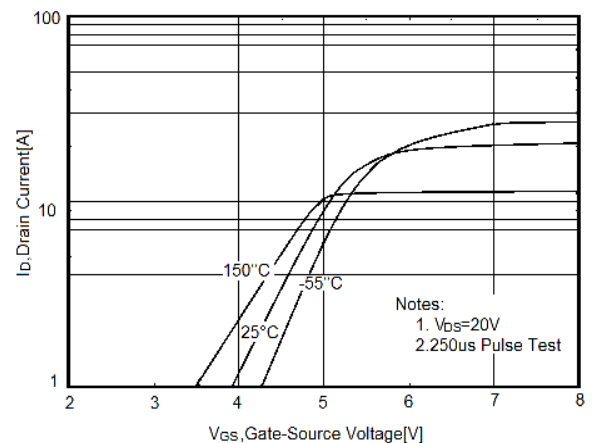


Figure 4. Transfer Characteristics

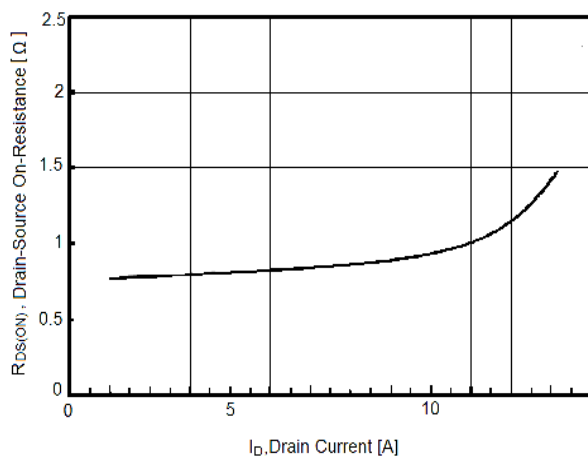


Figure 5. Static Drain-Source On Resistance

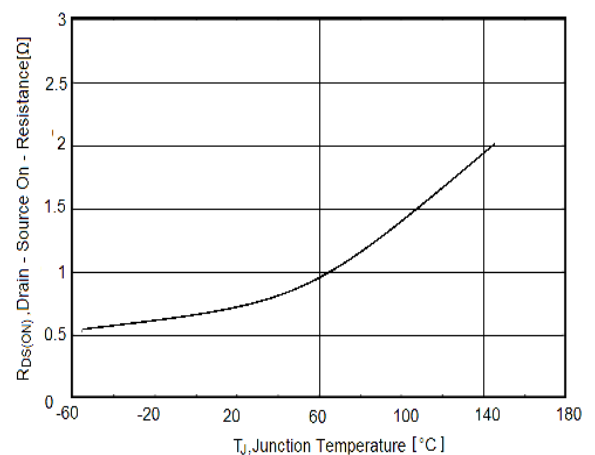


Figure 6. $R_{DS(on)}$ vs Junction Temperature

Typical Electrical and Thermal Characteristic Curves

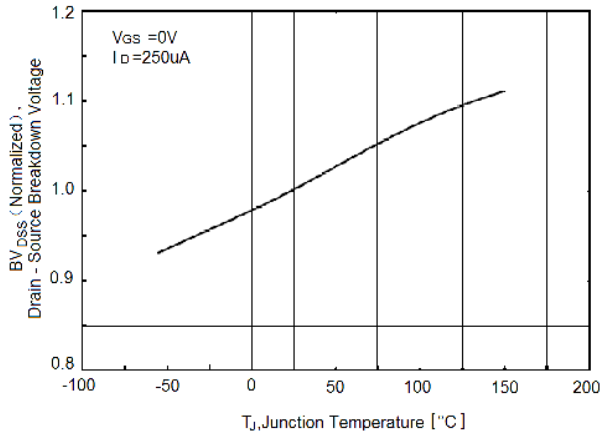


Figure 7. BV_{DSS} vs Junction Temperature

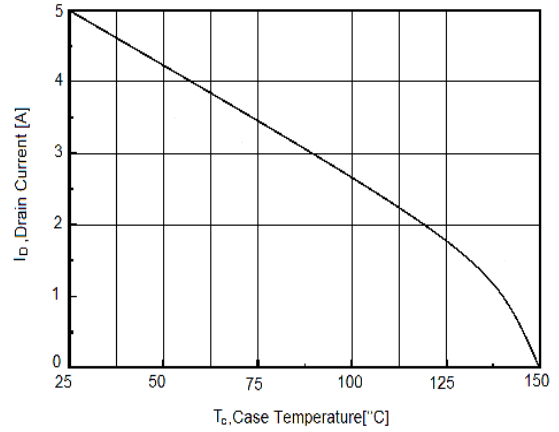


Figure 8. Maximum I_D vs Junction Temperature

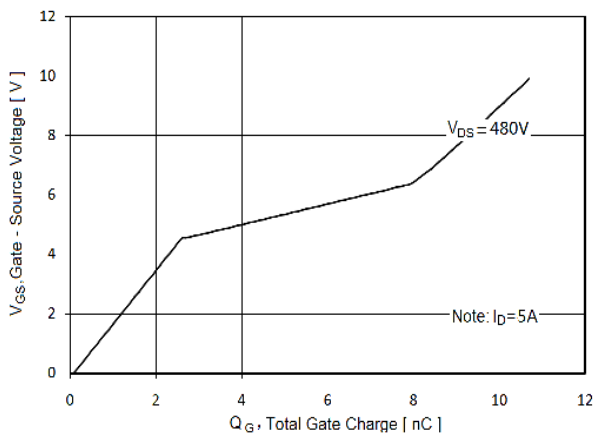


Figure 9. Gate Charge Waveforms

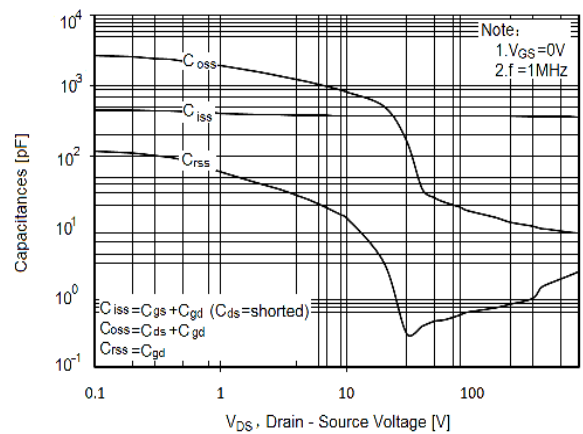


Figure 10. Capacitance

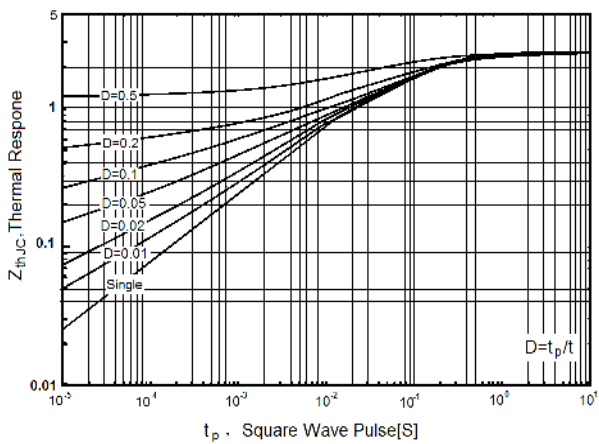


Figure 11. Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

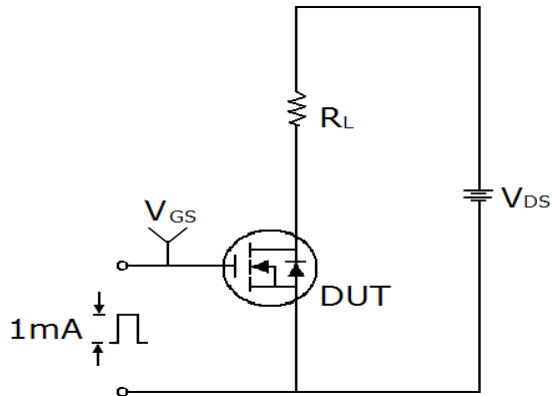


Figure 12. Gate Charge Test Circuit & Waveform

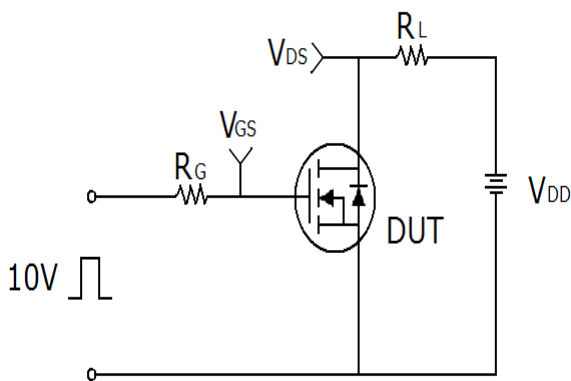
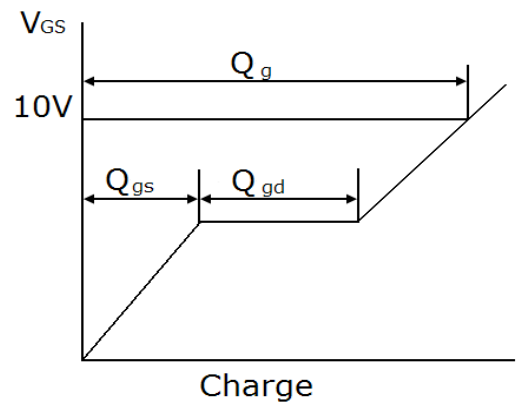


Figure 13. Switch Time Test Circuit

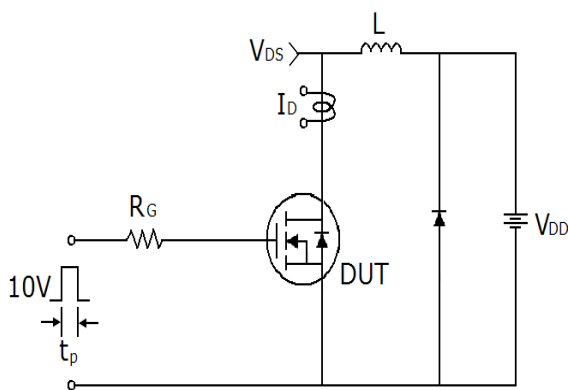
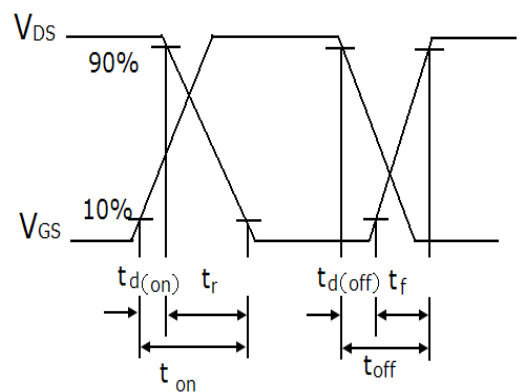
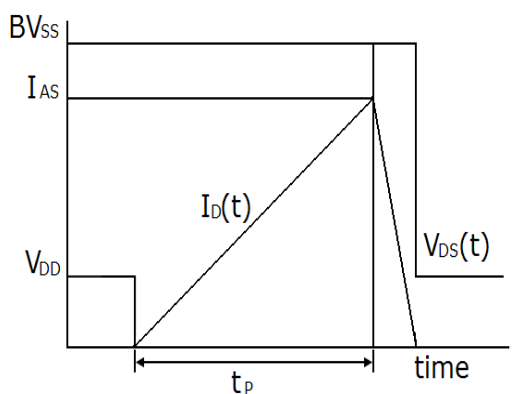
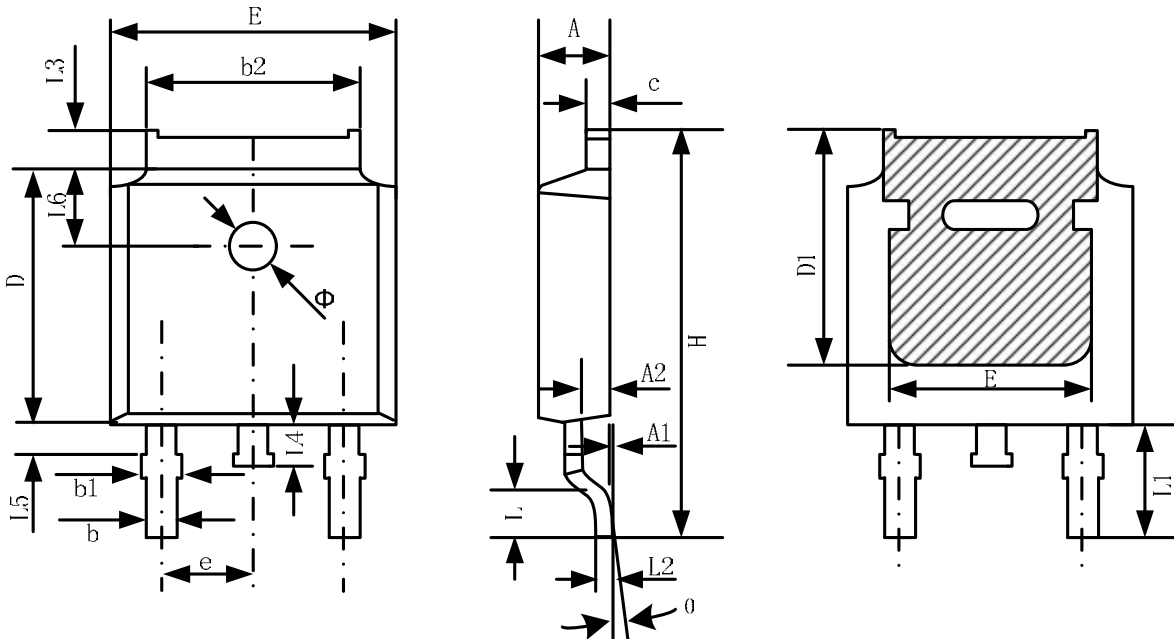


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms



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 REF	
Φ	1.20	1.40	0.047	0.055
θ	0°	8°	0°	8°