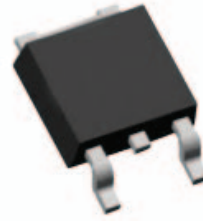
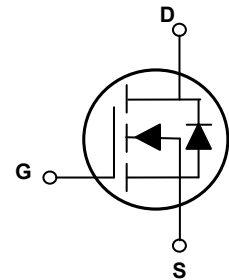


Main Product Characteristics

V_{DS}	550V
$R_{DS(ON)}$	1600m Ω
I_D	3.5A



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 GSJD5504 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($V_{GS}=0V$)	V_{DS}	550	V
Gate-Source Voltage($V_{DS}=0V$), AC($f>1\text{Hz}$)	V_{GS}	± 30	V
Drain Current-Continuous($T_C=25^\circ\text{C}$)	I_D	3.5	A
Drain Current-Continuous($T_C=100^\circ\text{C}$)		2.1	A
Drain Current-Pulsed ¹	I_{DM}	14	A
Maximum Power Dissipation($T_C=25^\circ\text{C}$)	P_D	22	W
Power Dissipation-Derate Above 25°C		0.176	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy ²	E_{AS}	16	mJ
Avalanche Current ¹	I_{AR}	0.4	A
Repetitive Avalanche Energy, t_{AR} Limited by T_{jmax} ¹	E_{AR}	0.1	mJ
Drain Source Voltage Slope, $V_{DS}\leq 480\text{V}$	dv/dt	50	V/nS
Reverse Diode dv/dt, $V_{DS}\leq 480V$, $I_{SD}<I_D$		15	V/nS
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.68	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C/W}$
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 ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	550	-	-	V
Zero Gate Voltage Drain Current ($T_C=25^\circ\text{C}$)	I_{DSS}	$V_{DS}=550V, V_{GS}=0V$	-	-	1	μA
Zero Gate Voltage Drain Current ($T_C=125^\circ\text{C}$)		$V_{DS}=550V, V_{GS}=0V$	-	-	50	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 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	$R_{DS(on)}$	$V_{GS}=10V, I_D=2A$	-	1300	1600	m Ω
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1.0\text{MHz}$	-	130	-	PF
Output Capacitance	C_{oss}		-	10	-	PF
Reverse Transfer Capacitance	C_{rss}		-	0.6	-	PF
Total Gate Charge	Q_g	$V_{DS}=440V, I_D=3.5A, V_{GS}=10V$	-	9	-	nC
Gate-Source Charge	Q_{gs}		-	2.5	-	nC
Gate-Drain Charge	Q_{gd}		-	4	-	nC
Switching Times						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=380V, I_D=1.5A, V_{GS}=10V, R_G=4.7\Omega$	-	10	-	nS
Turn-On Rise Time	t_r		-	9	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	56	-	nS
Turn-Off Fall Time	t_f		-	11	-	nS
Source-Drain Diode Characteristics						
Source-Drain Current(Body Diode)	I_{SD}	$T_C=25^\circ\text{C}$	-	-	4	A
Pulsed Source-Drain Current (Body Diode)	I_{SDM}		-	-	16	A
Forward On Voltage	V_{SD}	$T_J=25^\circ\text{C}, I_{SD}=3A, V_{GS}=0V$	-	0.9	1.2	V
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}, I_F=1.5A, di/dt=100A/\mu s$	-	190	-	nS
Reverse Recovery Charge	Q_{rr}		-	0.5	-	μC
Peak Reverse Recovery Current	I_{rrm}		-	5	-	A

Notes:

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature
2. $T_J=25^\circ\text{C}, V_{DD}=50V, V_G=10V, R_G=25\Omega$

Typical Electrical and Thermal Characteristic Curves

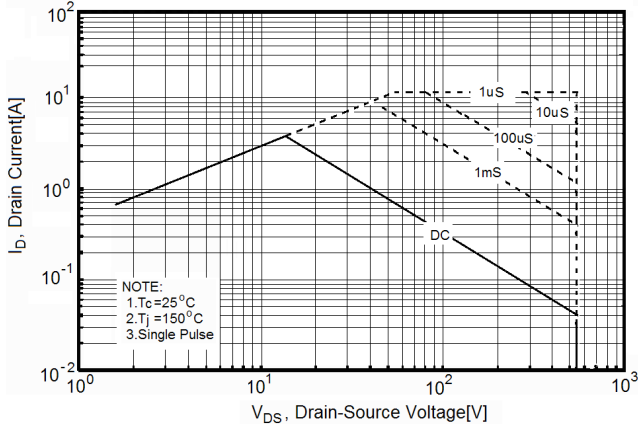


Figure 1. Safe Operation Area

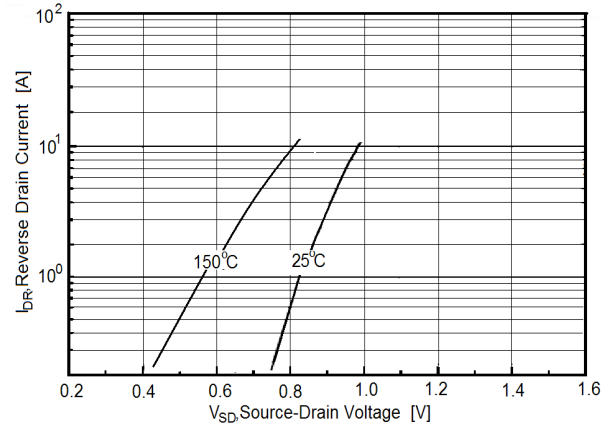


Figure 2. Source-Drain Diode Forward Voltage

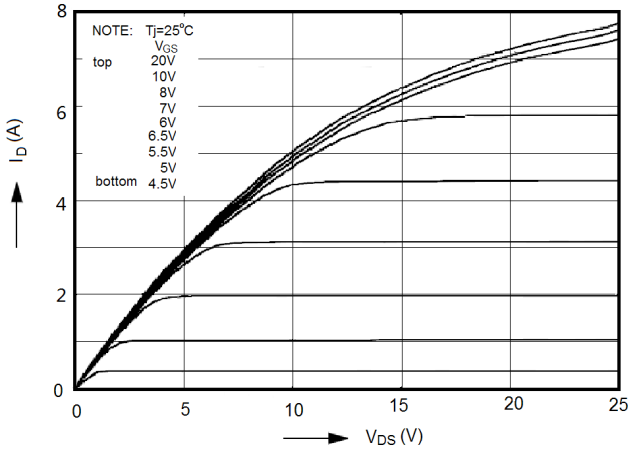


Figure 3. Output Characteristics

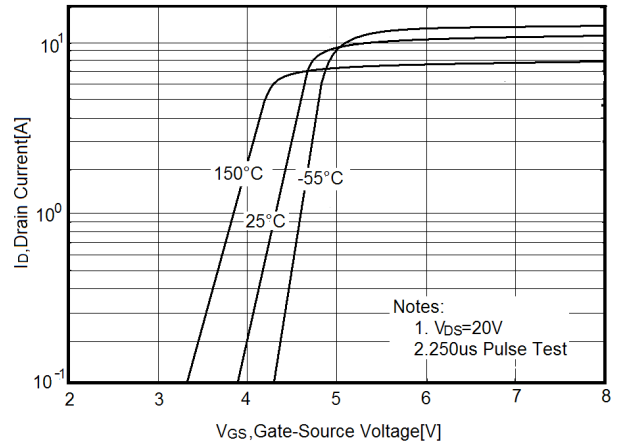


Figure 4. Transfer Characteristics

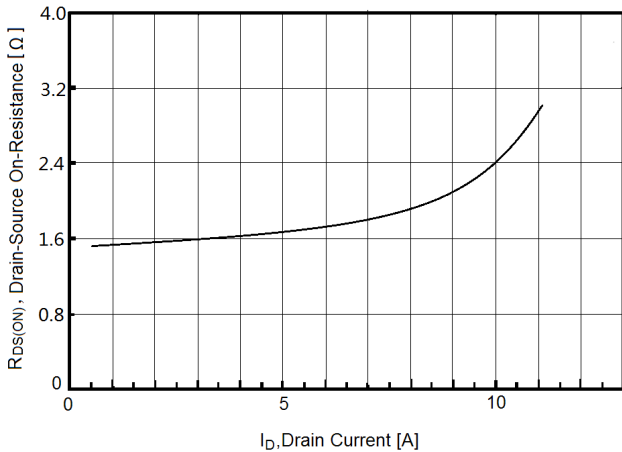


Figure 5. Static Drain-Source On Resistance

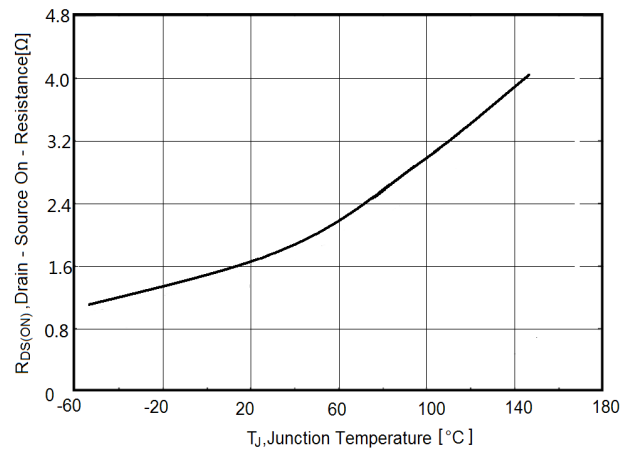


Figure 6. $R_{ds(on)}$ vs Junction Temperature

Typical Electrical and Thermal Characteristic Curves

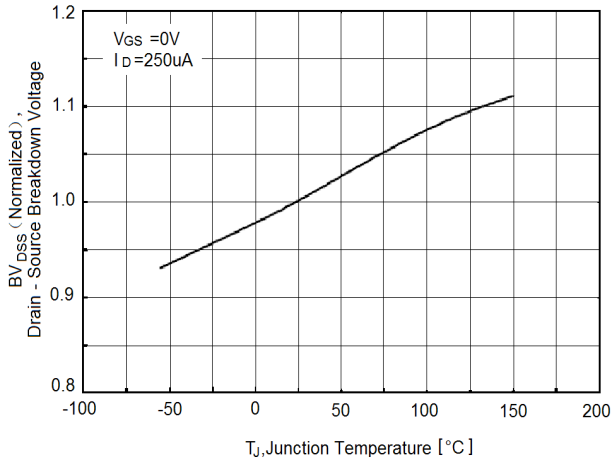


Figure 7. BV_{DSS} vs Junction Temperature

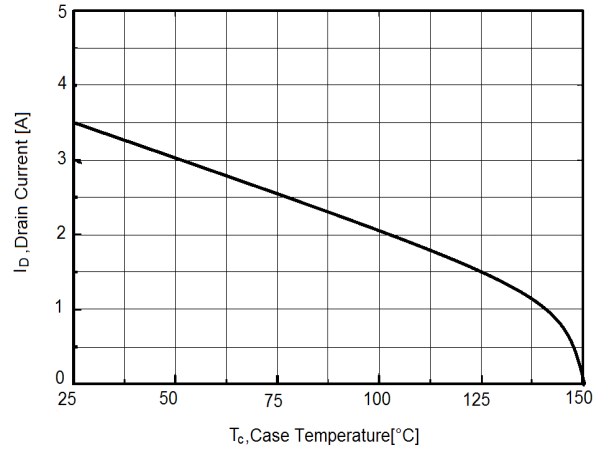


Figure 8. Maximum I_D vs Junction Temperature

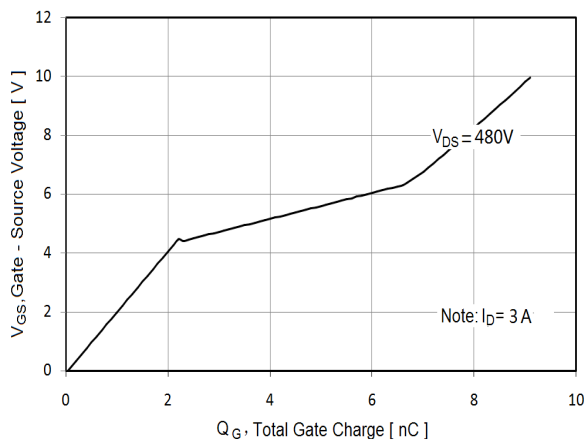


Figure 9. Gate Charge Waveforms

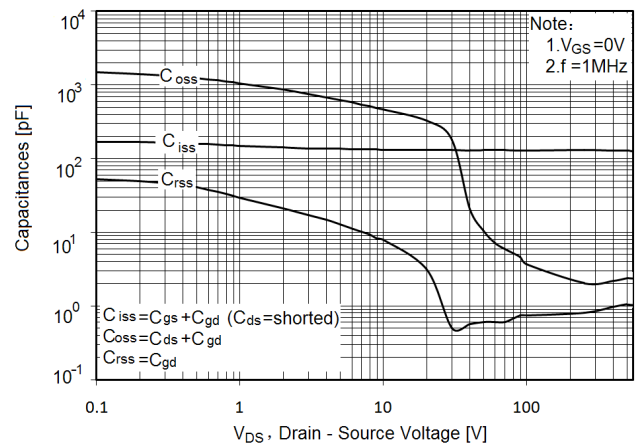


Figure 10. Capacitance

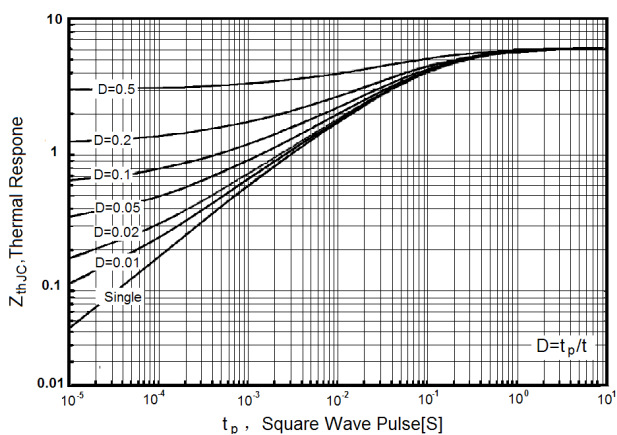


Figure 11. Transient Thermal Impedance

Typical Electrical and Thermal Characteristic Curves

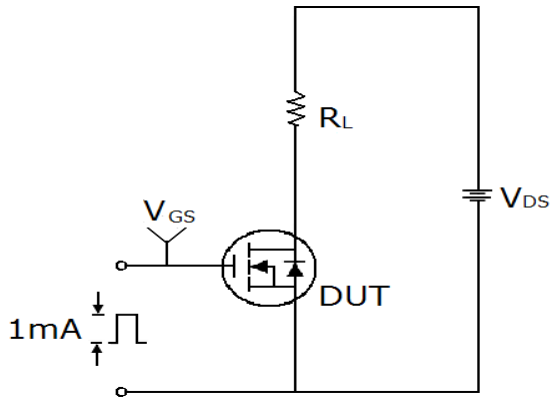


Figure 12. Gate Charge Test Circuit & Waveform

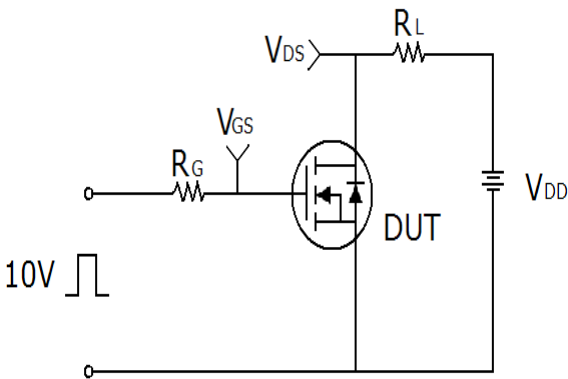
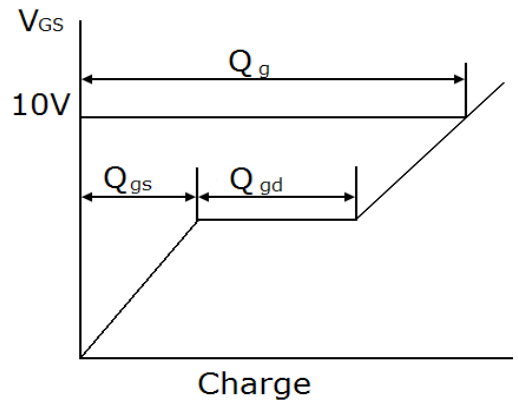


Figure 13. Switch Time Test Circuit

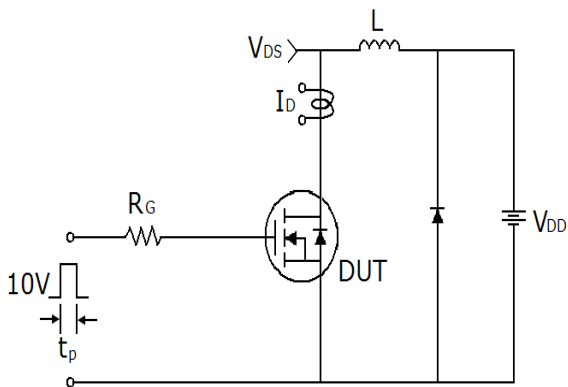
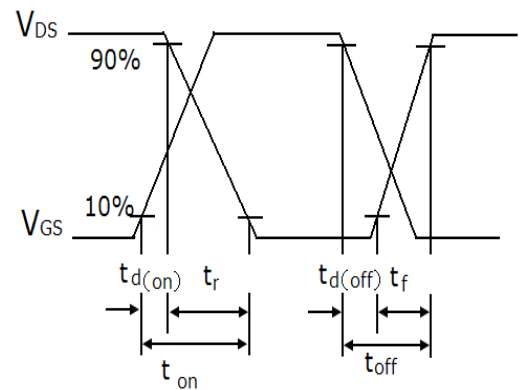
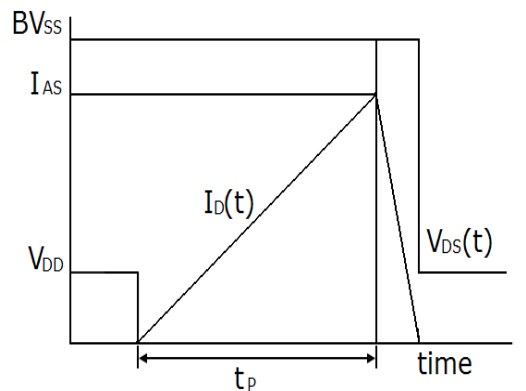
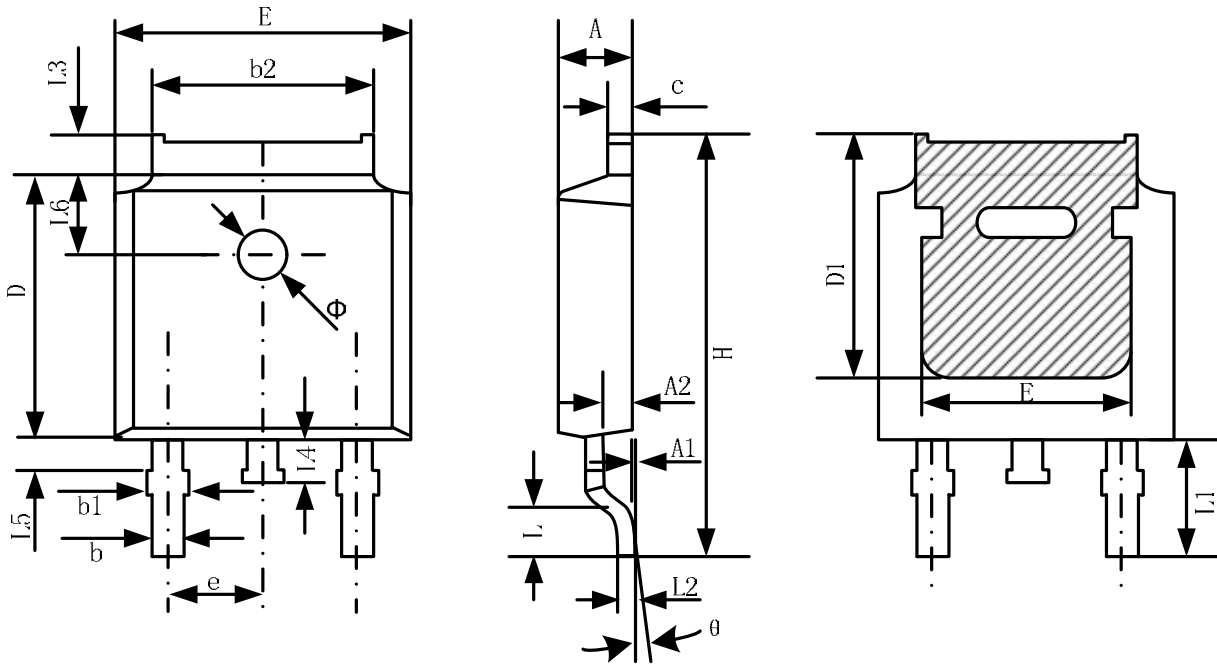


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms



Package Outline Dimensions (TO-252)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.20	2.35	0.087	0.093
A1	0.90	1.10	0.035	0.043
b	0.56	0.69	0.022	0.027
b1	0.77	0.90	0.030	0.035
b2	5.23	5.43	0.206	0.214
b3	-	1.05	0.000	0.041
C	0.46	0.59	0.018	0.023
c1	0.46	0.59	0.018	0.023
D	6.00	6.20	0.236	0.244
D1	5.20	-	0.205	-
E	6.50	6.70	0.256	0.264
E1	4.60	5.00	0.181	-
e	2.24	2.34	0.088	0.092
e1	4.47	4.67	0.176	0.184
H	16.18	16.78	0.637	0.661
L	9.00	9.60	0.354	0.378
L1	0.95	1.35	0.037	0.053
L2	0.90	1.25	0.035	0.049