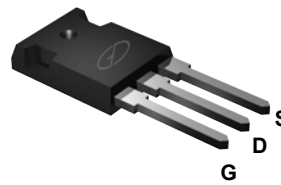
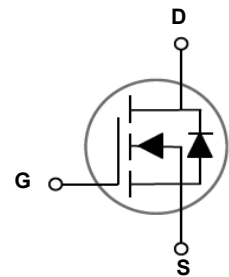


### Main Product Characteristics

$V_{DS}$	650V
$R_{DS(ON)}$	41m $\Omega$
$I_D$	75A



TO-247



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 GSJA6576 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	Value	Unit
Drain-Source Voltage ( $V_{GS}=0V$ )	$V_{DS}$	650	V
Gate-Source Voltage ( $V_{DS}=0V$ ), AC ( $f>1$ Hz)	$V_{GS}$	$\pm 30$	V
Drain Current-Continuous ( $T_C=25^\circ\text{C}$ )	$I_D$	75	A
Drain Current-Continuous ( $T_C=100^\circ\text{C}$ )		47	A
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	300	A
Power Dissipation ( $T_C=25^\circ\text{C}$ )	$P_D$	510	W
Power Dissipation-Derate Above $25^\circ\text{C}$		4.08	W/ $^\circ\text{C}$
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	1936	mJ
Avalanche Current <sup>1</sup>	$I_{AR}$	28	A
Repetitive Avalanche Energy, $t_{AR}$ Limited by $T_{jmax}$ <sup>1</sup>	$E_{AR}$	2.5	mJ
Drain Source Voltage Slope, $V_{DS} \leq 480V$ ,	dv/dt	50	V/nS
Reverse Diode dv/dt, $V_{DS} \leq 480V$ , $I_{SD} < I_D$	dv/dt	50	V/nS
Thermal Resistance, Junction-to-Case(Max.)	$R_{\theta JC}$	0.245	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Ambient(Max.)	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$

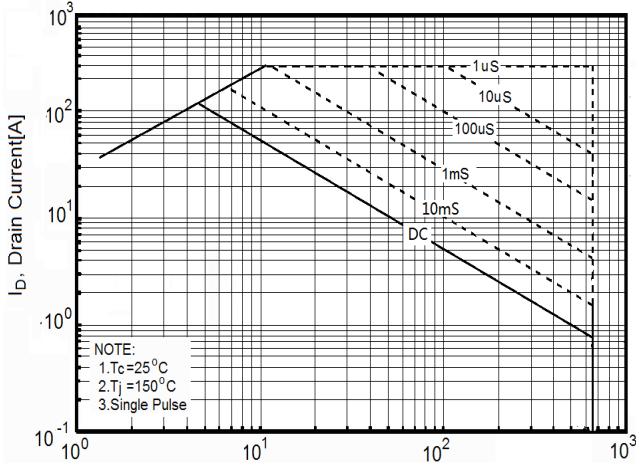
### Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =500μA	650	-	-	V
Zero Gate Voltage Drain Current (T <sub>C</sub> =25°C)	I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V	-	-	5	μA
Zero Gate Voltage Drain Current (T <sub>C</sub> =125°C)		V <sub>DS</sub> =650V, V <sub>GS</sub> =0V	-	-	500	μA
Gate-Body Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	-	-	±100	nA
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =500μA	2.5	3.5	4.5	V
Drain-Source On-State Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =38A	-	36	41	mΩ
<b>Dynamic Characteristics</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V, F=1.0MHz	-	7300	8500	pF
Output Capacitance	C <sub>OSS</sub>		-	252	-	
Reverse Transfer Capacitance	C <sub>RSS</sub>		-	4	-	
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =480V, I <sub>D</sub> =75A, V <sub>GS</sub> =10V	-	116	135	nC
Gate-Source Charge	Q <sub>gs</sub>		-	40	-	
Gate-Drain Charge	Q <sub>gd</sub>		-	30	-	
<b>Switching Characteristics</b>						
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> =380V, I <sub>D</sub> =38A, V <sub>GS</sub> =10V, R <sub>G</sub> =1.2Ω	-	27	-	nS
Turn-On Rise Time	t <sub>r</sub>		-	22	-	
Turn-Off Delay Time	t <sub>d(off)</sub>		-	118	180	
Turn-Off Fall Time	t <sub>f</sub>		-	13	30	
<b>Source-Drain Diode Characteristics</b>						
Source-Drain Current (Body Diode)	I <sub>SD</sub>	T <sub>C</sub> =25°C	-	75	-	A
Pulsed Source-Drain Current (Body Diode)	I <sub>SDM</sub>		-	300	-	A
Forward On Voltage	V <sub>SD</sub>	T <sub>J</sub> =25°C, I <sub>SD</sub> =75A, V <sub>GS</sub> =0V	-	1.3	-	V
Reverse Recovery Time	t <sub>rr</sub>	T <sub>J</sub> =25°C, I <sub>F</sub> =38A, di/dt=100A/μs, V <sub>DD</sub> =300V	-	230	-	nS
Reverse Recovery Charge	Q <sub>rr</sub>		-	3	-	μC
Peak Reverse Recovery Current	I <sub>rrm</sub>		-	26	-	A

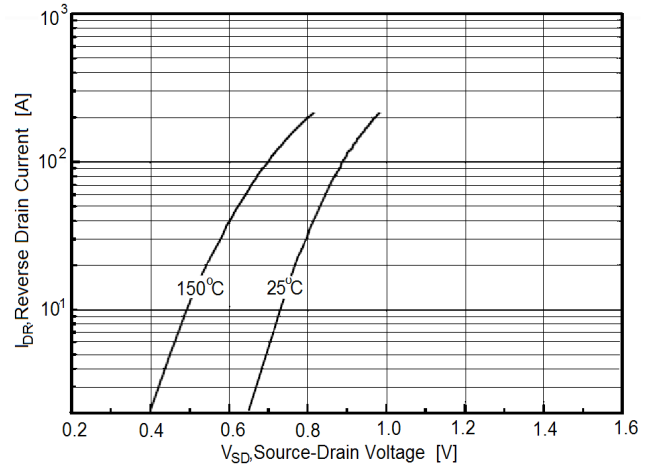
Notes 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2. T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω

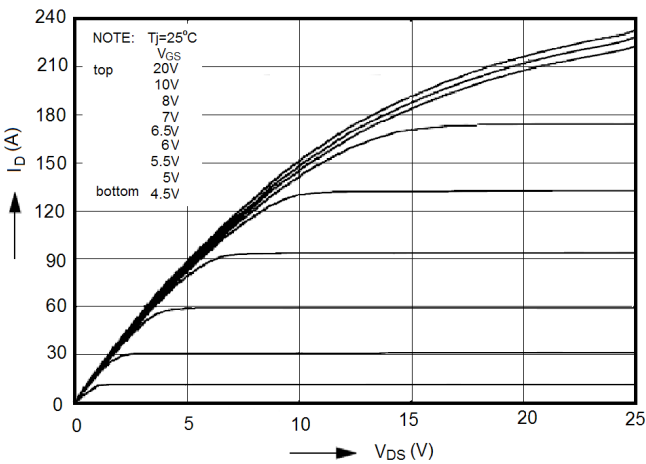
**Typical Electrical and Thermal Characteristic Curves**



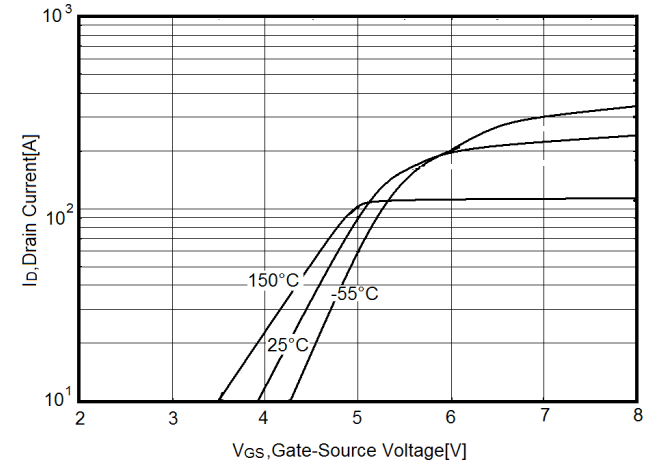
**Figure 1. Safe Operating Area**



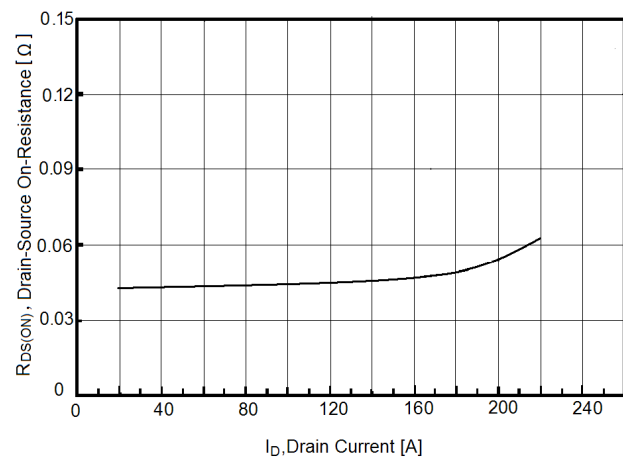
**Figure 2. Source-Drain Diode Forward Voltage**



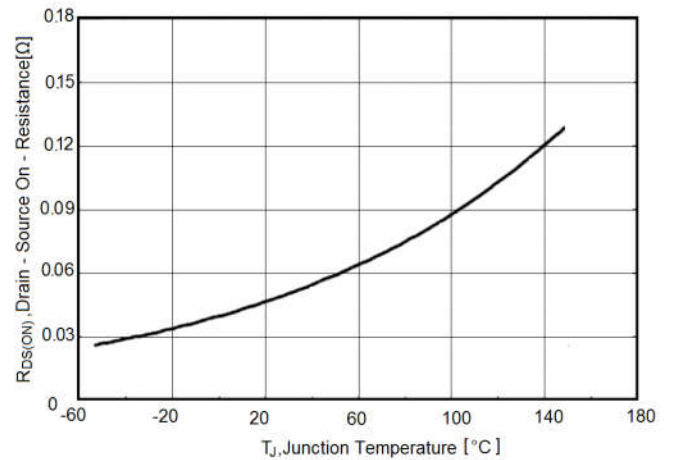
**Figure 3. Output Characteristics**



**Figure 4. Transfer Characteristics**

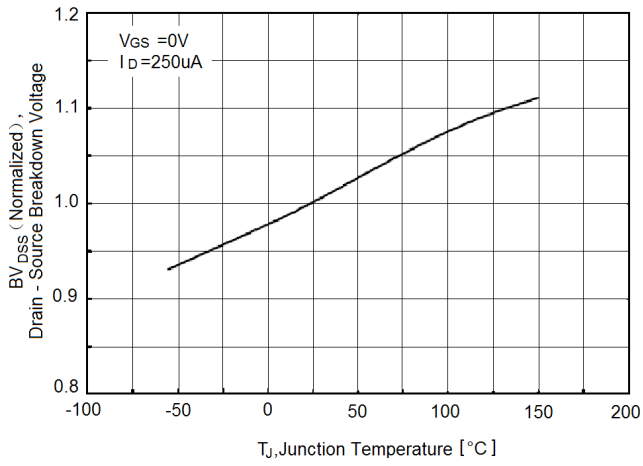


**Figure 5. Static Drain-Source On Resistance**

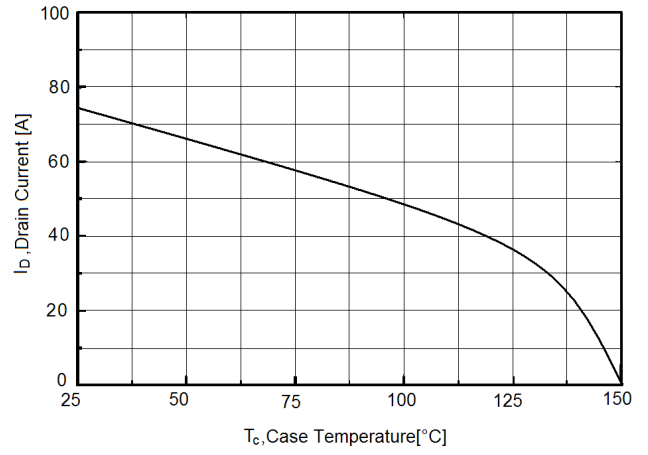


**Figure 6.  $R_{DS(ON)}$  vs Junction Temperature**

**Typical Electrical and Thermal Characteristic Curves**

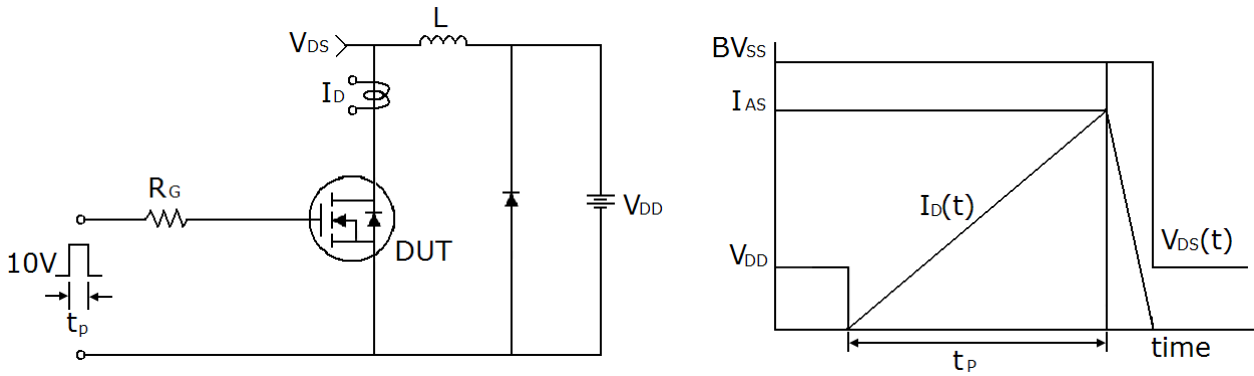


**Figure 7. BV<sub>DSS</sub> vs Junction Temperature**

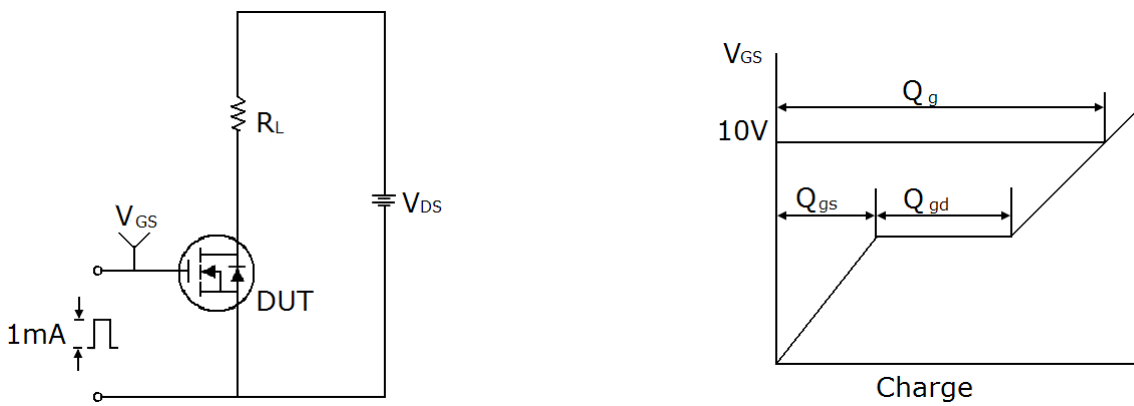


**Figure 8. Maximum I<sub>D</sub> vs Junction Temperature**

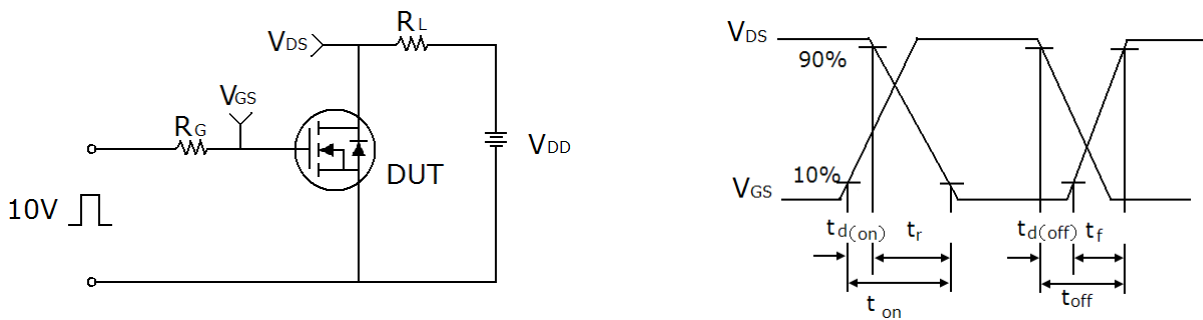
**Test Circuit**



**Figure 9. E<sub>AS</sub> Test Circuit**

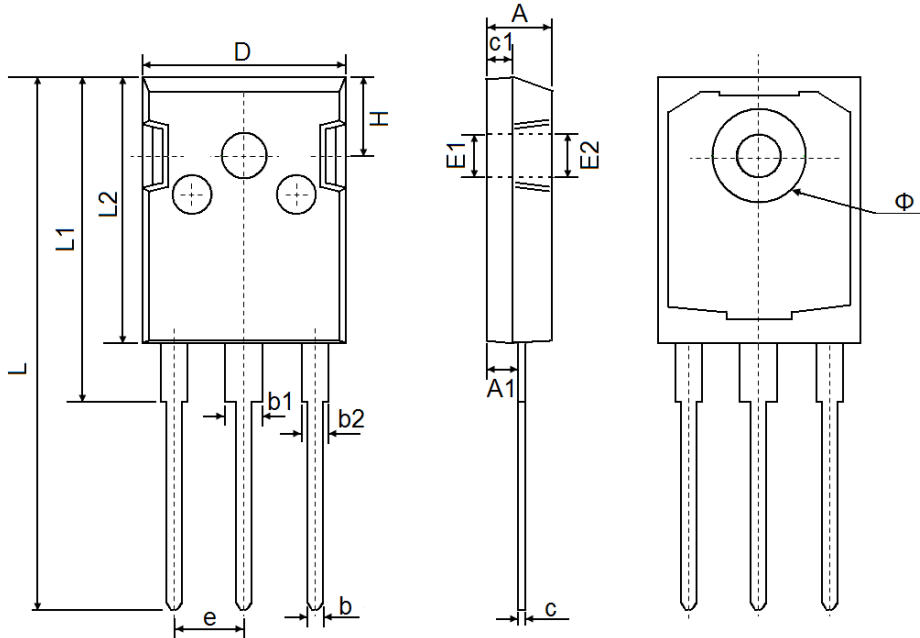


**Figure 10. Gate Charge Test Circuit**



**Figure 11. Switch Time Test Circuit**

**Package Outline Dimensions (TO-247)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	