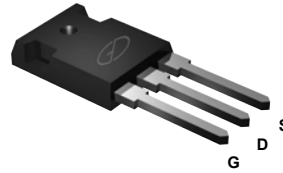
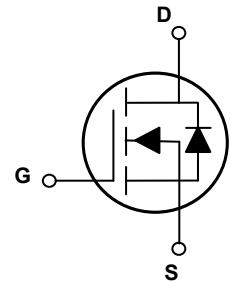


### Main Product Characteristics

$V_{(BR)DSS}$	600V
$R_{DS(ON)}$	33m $\Omega$ (max.)
$I_D$	83A



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 GSJA60R032 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 supplies and a wide variety of other applications.

### Absolute Maximum Ratings (T<sub>J</sub>=25°C unless otherwise specified)

Parameter	Symbol	Parameter	Unit
Drain-Source Voltage	V <sub>DS</sub>	600	V
Gate-to-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current, @ Steady-State (T <sub>C</sub> =25°C)	I <sub>D</sub>	83	A
Continuous Drain Current, @ Steady-State (T <sub>C</sub> =100°C)		52	A
Pulsed Drain Current	I <sub>DM</sub>	249	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	544	W
		4.35	W/°C
Single Pulse Avalanche Energy <sup>1</sup>	E <sub>AS</sub>	3228	mJ
Body Diode Reverse Voltage Slope <sup>2</sup>	dv/dt	50	V/ns
MOS dv/dt Ruggedness <sup>3</sup>	dv/dt	50	V/ns
Junction-to-Ambient (PCB Mounted, Steady-State)	R <sub>θJA</sub>	50	°C/W
Junction-to-Case	R <sub>θJC</sub>	0.23	°C/W
Operating Junction and Storage Temperature Range	T <sub>J</sub> /T <sub>STG</sub>	-55 to +150	°C
Soldering Temperature	T <sub>sold</sub>	260	°C

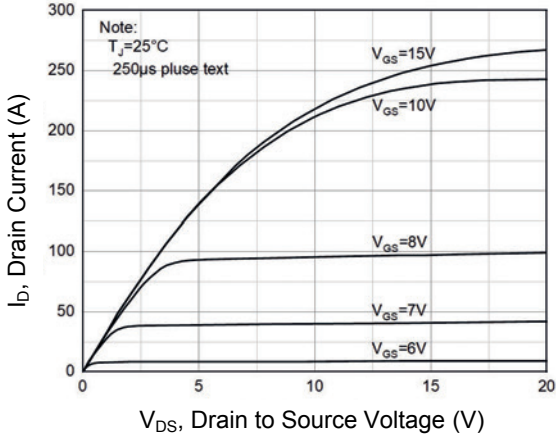
### Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On / Off Characteristics</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	600	-	-	V
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS}=600V, V_{GS}=0V, T_J=25^\circ\text{C}$	-	-	1.0	$\mu A$
		$V_{DS}=600V, V_{GS}=0V, T_J=125^\circ\text{C}$	-	23	-	$\mu A$
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{DS}=0V, V_{GS}=20V$	-	-	100	nA
		$V_{DS}=0V, V_{GS}=-20V$	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=35A$	-	28	33	m $\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	3.0	-	5.0	V
<b>Dynamic and Switching Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=200V, f=1\text{MHz}$	-	7700	-	pF
Output Capacitance	$C_{oss}$		-	227	-	
Reverse Transfer Capacitance	$C_{rss}$		-	10	-	
Total Gate Charge <sup>4,5</sup>	$Q_g$	$I_D=42A, V_{DD}=480V, V_{GS}=10V$	-	169	-	nC
Gate-to-Source Charge <sup>4,5</sup>	$Q_{gs}$		-	61	-	
Gate-to-Drain ("Miller") Charge <sup>4,5</sup>	$Q_{gd}$		-	71	-	
Gate Plateau <sup>4,5</sup>	$V_{plateau}$		-	7.5	-	V
Turn-On Delay Time <sup>4,5</sup>	$t_{d(on)}$	$V_{DD}=400V, V_{GS}=10V, R_G=4.7\Omega, I_D=42A$	-	60	-	nS
Rise Time <sup>4,5</sup>	$t_r$		-	74	-	
Turn-Off Delay Time <sup>4,5</sup>	$t_{d(off)}$		-	134	-	
Fall Time <sup>4,5</sup>	$t_f$		-	43	-	
Gate Resistance	$R_g$	$f=1\text{MHz}$	-	2.0	-	$\Omega$
<b>Source-Drain Ratings and Characteristics</b>						
Continuous Source Current (Body Diode)	$I_S$	$T_C=25^\circ\text{C}$ , MOSFET symbol showing the integral reverse p-n junction diode.	-	-	83	A
Source Pulse Current	$I_{S, pulse}$		-	-	249	A
Diode Forward Voltage	$V_{SD}$	$I_S=42A, V_{GS}=0V$	-	-	1.4	V
Reverse Recovery Time <sup>4</sup>	$T_{rr}$	$I_S=42A, V_{GS}=0V, V_R=400V, di_f/dt=100A/\mu s$	-	173	-	nS
Reverse Recovery Charge <sup>4</sup>	$Q_{rr}$		-	1.23	-	$\mu C$
Reverse Recovery Peak Current <sup>4</sup>	$I_{rrm}$		-	14	-	A

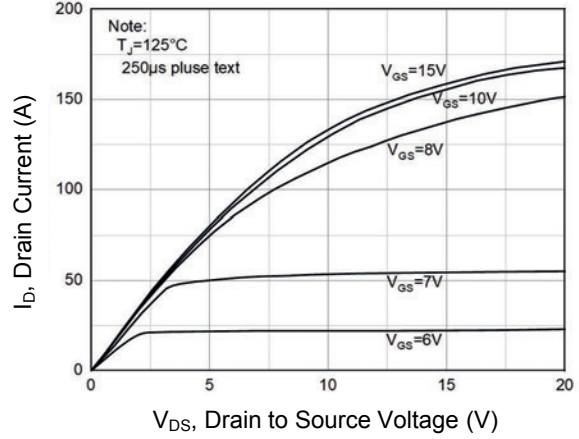
Notes:

1.  $L=79\text{mH}, I_{AS}=8.4A, V_{DD}=100V, R_G=25\Omega$ , starting temperature  $T_J=25^\circ\text{C}$ .
2.  $V_{DS}=0-400V, I_{SD}\leq I_S, T_J=25^\circ\text{C}$ .
3.  $V_{DS}=0-400V$ .
4. Pulse test : pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .
5. Essentially independent of operating temperature.

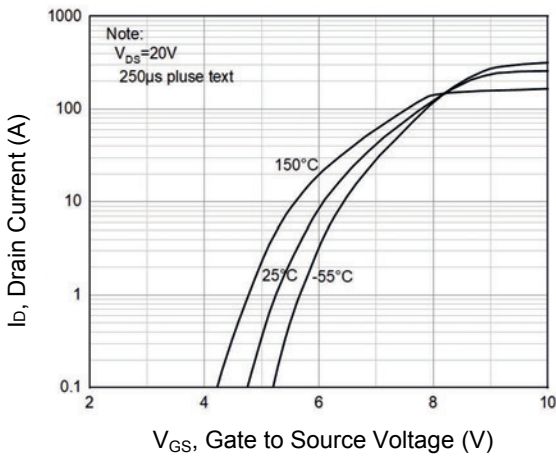
### Typical Electrical and Thermal Characteristic Curves



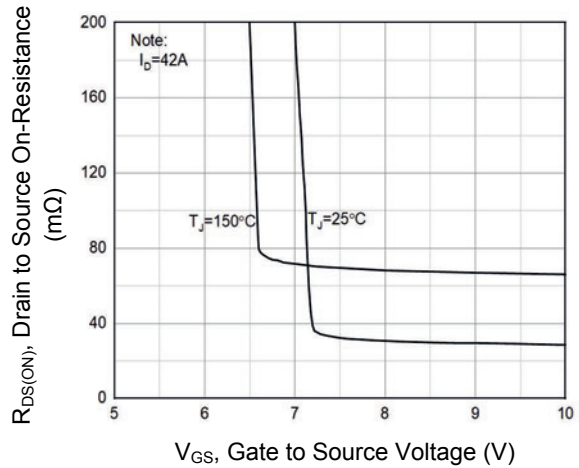
**Figure 1. Typical Output Characteristics**



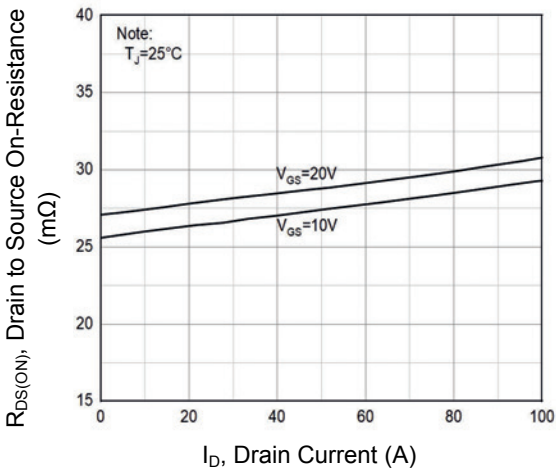
**Figure 2. Typical Output Characteristics**



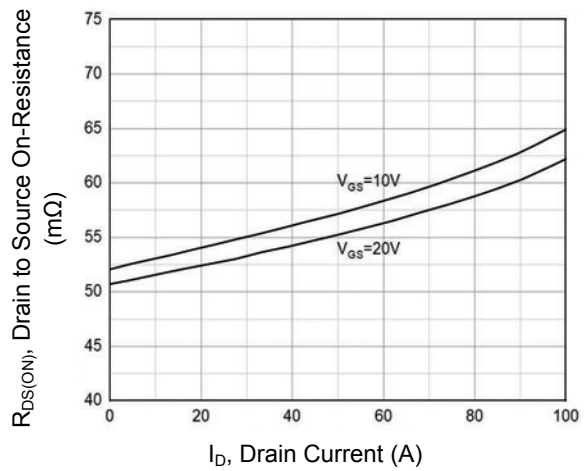
**Figure 3. Transfer Characteristics**



**Figure 4. Normalized  $R_{DS(ON)}$  vs.  $V_{GS}$**

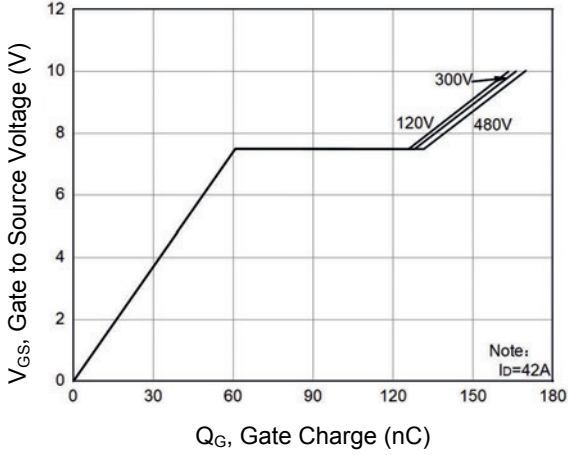


**Figure 5.  $R_{DS(ON)}$  vs. Drain Current**

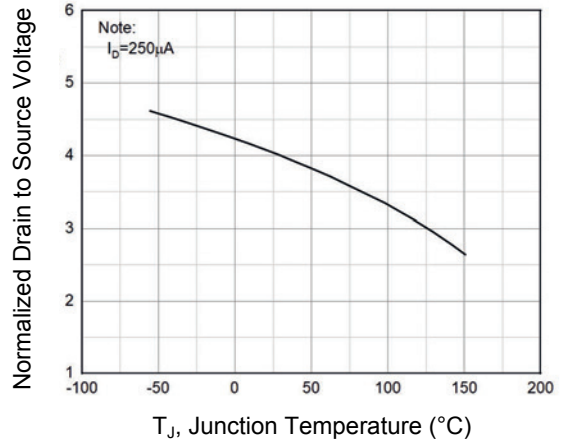


**Figure 6.  $R_{DS(ON)}$  vs. Drain Current**

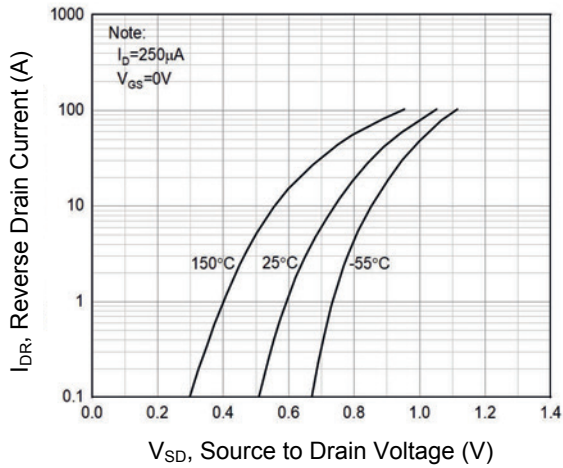
### Typical Electrical and Thermal Characteristic Curves



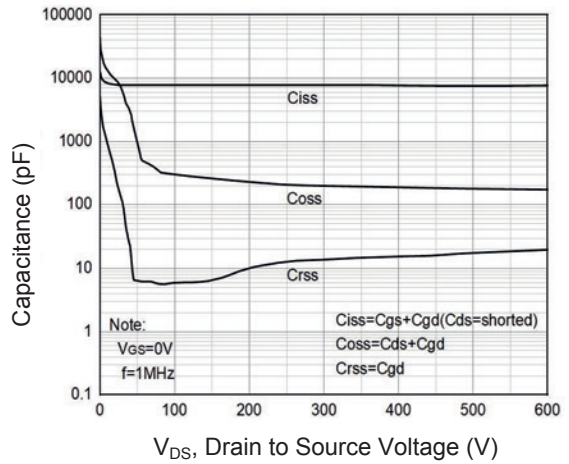
**Figure 7. Gate Charge Characteristics**



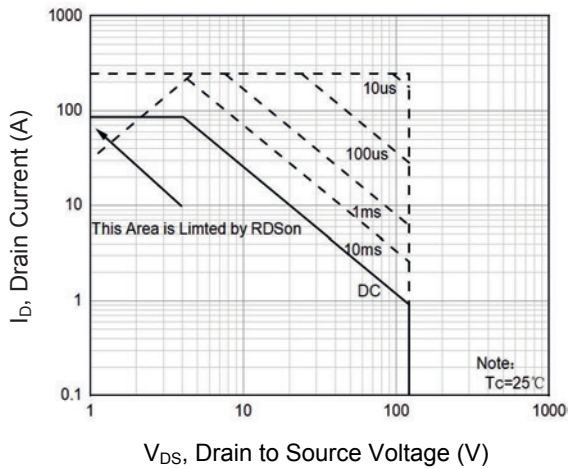
**Figure 8. Normalized  $BV_{DSS}$  vs.  $T_J$**



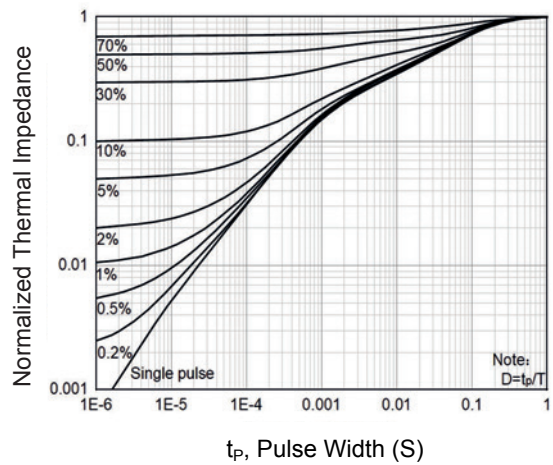
**Figure 9. Body Diode Characteristics**



**Figure 10. Capacitance Characteristics**

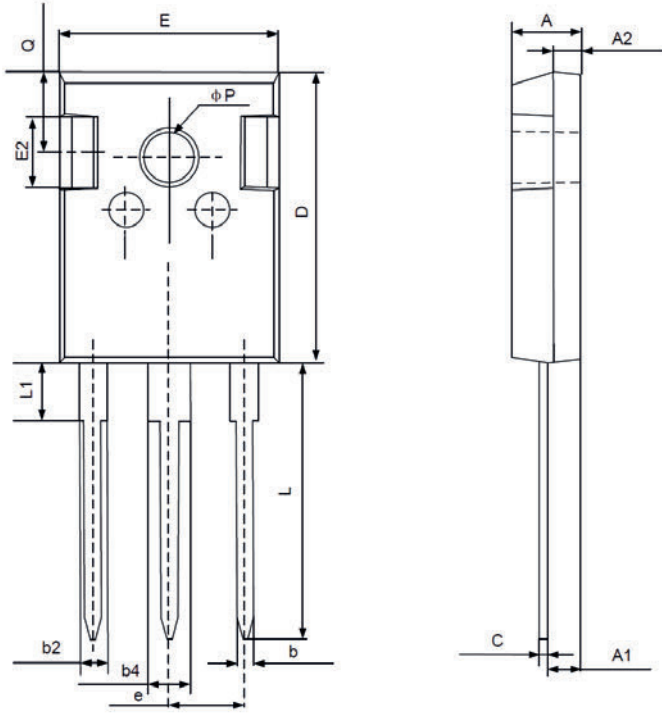


**Figure 11. Safe Operation Area**



**Figure 12. Transient Thermal Impedance vs.  $t_p$**

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



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.80	5.20	0.189	0.205
A1	2.21	2.59	0.087	0.102
A2	1.85	2.15	0.073	0.085
b	1.11	1.36	0.044	0.054
b2	1.91	2.25	0.075	0.089
b4	2.91	3.25	0.115	0.128
C	0.51	0.75	0.020	0.030
D	20.80	21.30	0.819	0.839
E	15.50	16.10	0.610	0.634
E2	4.40	5.20	0.173	0.205
e	5.44 BSC		0.214 BSC	
L	19.72	20.22	0.776	0.796
L1	-	4.30	-	0.169
Q	5.60	6.00	0.220	0.236
P	3.40	3.80	0.134	0.150