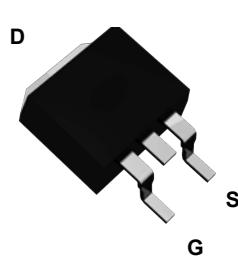
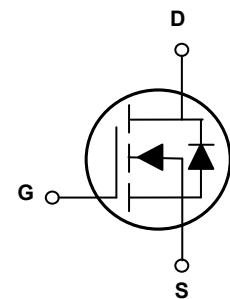


### Main Product Characteristics

$V_{(BR)DSS}$	65V
$R_{DS(ON)}$	5.3mΩ
$I_D$	100A



TO-263 (D<sup>2</sup>PAK)



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 GSGT65100 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	$V_{DS}$	65	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous ( $T_C=25^\circ C$ )	$I_D$	100	A
Drain Current-Continuous ( $T_C=100^\circ C$ )		63	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	400	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	180	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	60	A
Power Dissipation ( $T_C=25^\circ C$ )	$P_D$	129	W
Power Dissipation-Derate above 25°C		1.03	W/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.97	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°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-Source Breakdown Voltage	$\text{BV}_{\text{DSS}}$	$V_{\text{GS}}=0\text{V}, I_{\text{D}}=250\mu\text{A}$	65	-	-	V
Drain-Source Leakage Current	$I_{\text{DS}(\text{SS})}$	$V_{\text{DS}}=60\text{V}, V_{\text{GS}}=0\text{V}, T_J=25^\circ\text{C}$	-	-	1	$\mu\text{A}$
		$V_{\text{DS}}=48\text{V}, V_{\text{GS}}=0\text{V}, T_J=85^\circ\text{C}$	-	-	10	$\mu\text{A}$
Gate-Source Leakage Current	$I_{\text{GSS}}$	$V_{\text{GS}}=\pm 20\text{V}, V_{\text{DS}}=0\text{V}$	-	-	$\pm 100$	nA
Static Drain-Source On-Resistance	$R_{\text{DS}(\text{ON})}$	$V_{\text{GS}}=10\text{V}, I_{\text{D}}=20\text{A}$	-	4.4	5.3	$\text{m}\Omega$
Gate Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{GS}}=V_{\text{DS}}, I_{\text{D}}=250\mu\text{A}$	2	3	4	V
Forward Transconductance	$g_{\text{f}}$	$V_{\text{DS}}=10\text{V}, I_{\text{D}}=3\text{A}$	-	10	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{\text{DS}}=30\text{V}, I_{\text{D}}=50\text{A}$ $V_{\text{GS}}=10\text{V}$	-	34	50	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{\text{gs}}$		-	7.4	10	
Gate-Drain Charge <sup>3,4</sup>	$Q_{\text{gd}}$		-	13	20	
Turn-On Delay Time <sup>3,4</sup>	$t_{\text{d}(\text{on})}$	$V_{\text{DD}}=30\text{V}, R_{\text{G}}=6\Omega$ $V_{\text{GS}}=10\text{V}, I_{\text{D}}=50\text{A}$	-	10	15	nS
Rise Time <sup>3,4</sup>	$t_r$		-	16	24	
Turn-Off Delay Time <sup>3,4</sup>	$t_{\text{d}(\text{off})}$		-	42	63	
Fall Time <sup>3,4</sup>	$t_f$		-	38	57	
Input Capacitance	$C_{\text{iss}}$	$V_{\text{DS}}=30\text{V}, V_{\text{GS}}=0\text{V}, F=1\text{MHz}$	-	1900	2850	pF
Output Capacitance	$C_{\text{oss}}$		-	890	1340	
Reverse Transfer Capacitance	$C_{\text{rss}}$		-	17	25	
Gate Resistance	$R_g$	$V_{\text{GS}}=0\text{V}, V_{\text{DS}}=0\text{V}, F=1\text{MHz}$	-	1.2	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_s$	$V_G=V_D=0\text{V},$ Force Current	-	-	100	A
Pulsed Source Current	$I_{\text{SM}}$		-	-	200	A
Diode Forward Voltage	$V_{\text{SD}}$	$V_{\text{GS}}=0\text{V}, I_s=1\text{A}, T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$t_{\text{rr}}$	$V_R=50\text{V}, I_s=10\text{A}$ $dI/dt=100\text{A}/\mu\text{s}$ $T_J=25^\circ\text{C}$	-	60	-	nS
Reverse Recovery Charge	$Q_{\text{rr}}$		-	80	-	nC

Note:

1. Repetitive rating: Pulsed width limited by maximum junction temperature.
2.  $V_{\text{DD}}=25\text{V}, V_{\text{GS}}=10\text{V}, L=0.1\text{mH}, I_{\text{AS}}=60\text{A}, R_{\text{G}}=25\Omega$ , starting  $T_J=25^\circ\text{C}$ .
3. Pulse test: pulse width  $\leq 300\text{us}$ , duty cycle  $\leq 2\%$ .
4. Essentially independent of operation temperature.

## Typical Electrical and Thermal Characteristic Curves

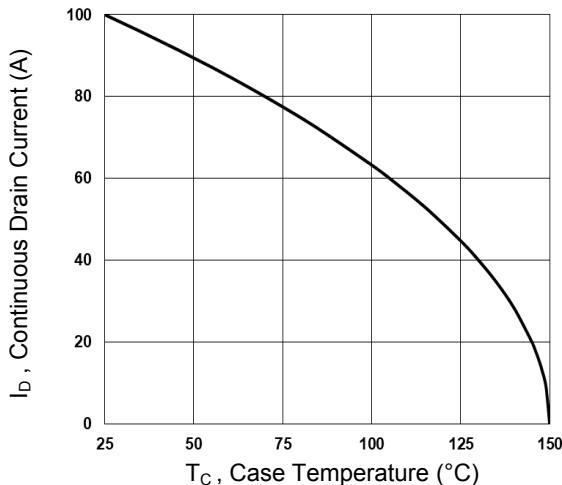


Figure 1. Continuous Drain Current vs.  $T_c$

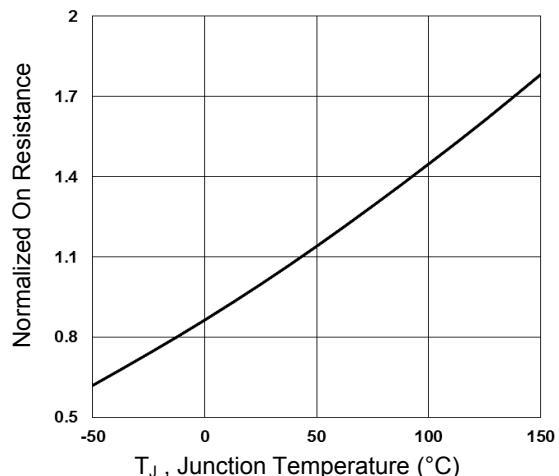


Figure 2. Normalized  $R_{DSON}$  vs.  $T_j$

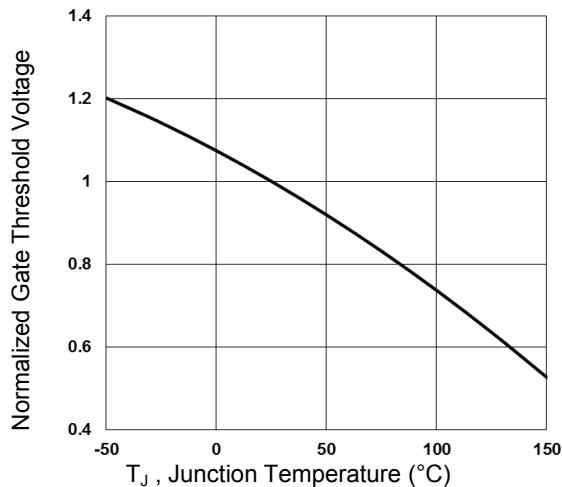


Figure 3. Normalized  $V_{th}$  vs.  $T_j$

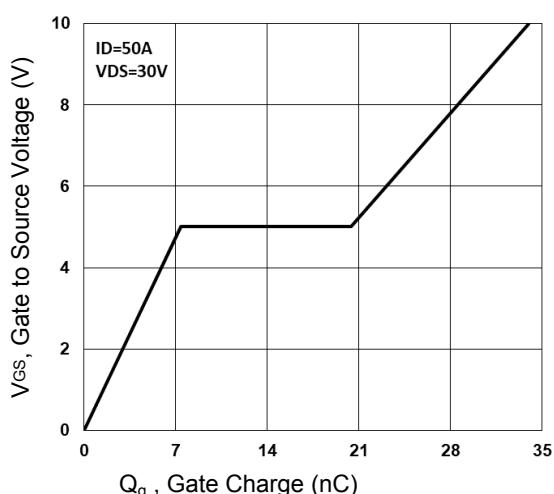


Figure 4. Gate Charge Characteristic

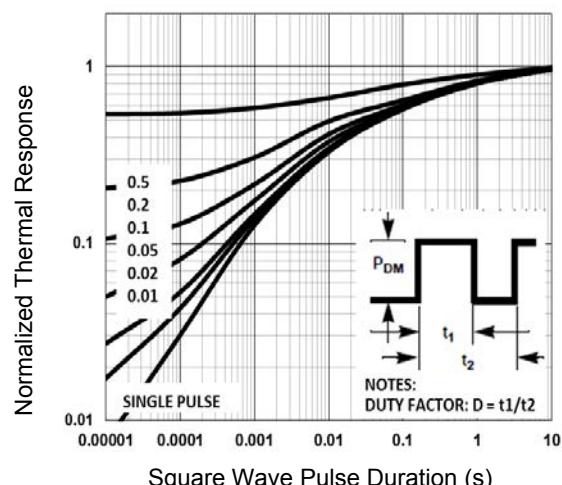


Figure 5. Normalized Transient Impedance

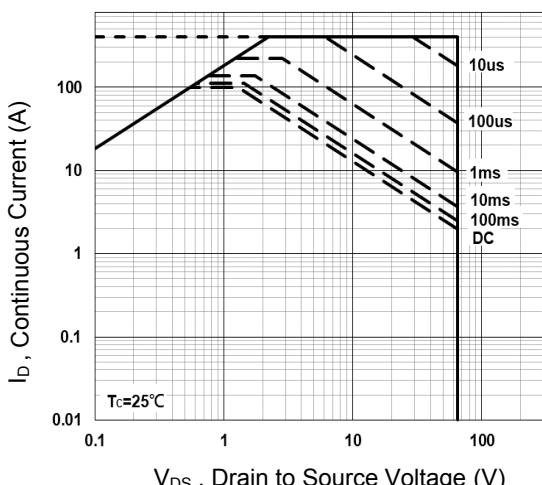


Figure 6. Maximum Safe Operation Area

### Typical Electrical and Thermal Characteristic Curves

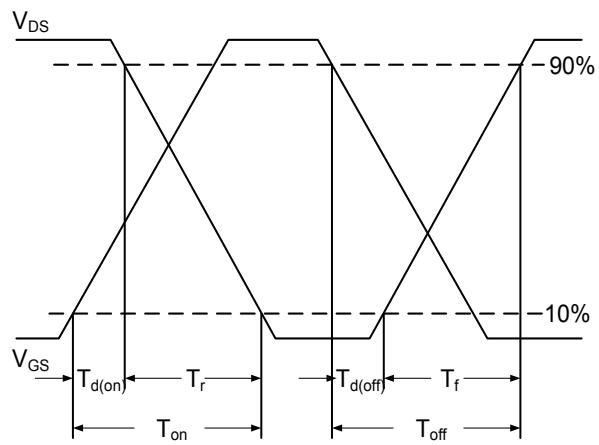


Figure 7. Switching Time Waveform

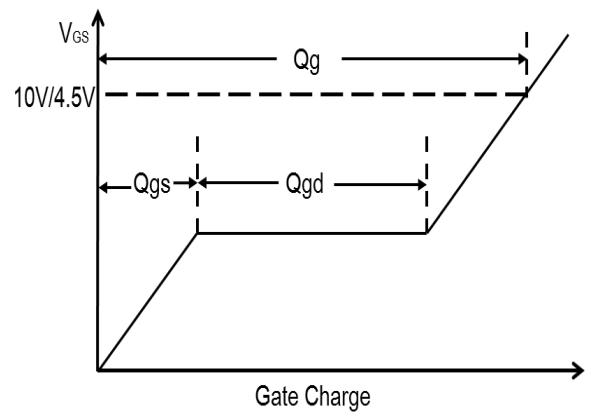
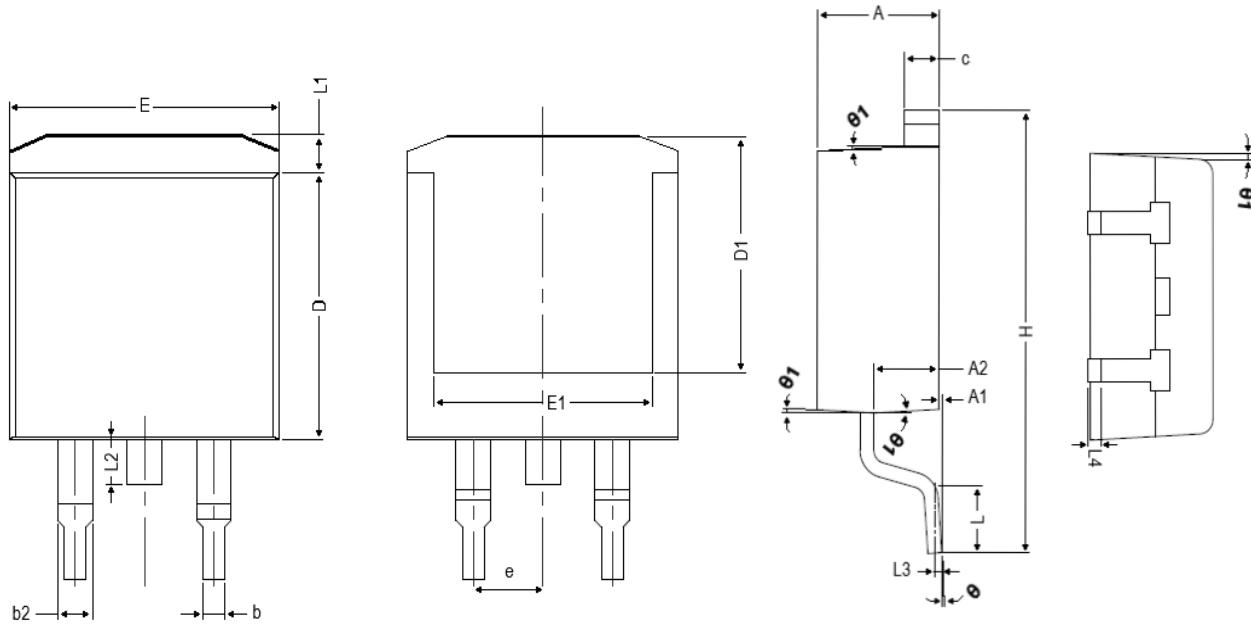


Figure 8. Gate Charge Waveform

**Package Outline Dimensions      TO-263(D<sup>2</sup>PAK)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	4.850	4.250	0.191	0.167
A1	0.250	0.000	0.001	0.000
A2	2.900	2.350	0.114	0.093
b	0.950	0.700	0.037	0.028
b2	1.600	1.000	0.063	0.039
c	1.450	1.200	0.057	0.047
D	9.500	8.350	0.374	0.329
D1	9.150	6.400	0.360	0.252
E	10.500	9.600	0.413	0.378
E1	8.900	7.500	0.350	0.295
e	2.540 BSC		0.100 BSC	
H	15.900	14.600	0.626	0.575
L	2.800	2.000	0.110	0.079
L1	1.700	1.150	0.067	0.045
L2	2.100	1.400	0.083	0.055
L3	0.250 BSC		0.010 BSC	
L4	0.750	0.200	0.030	0.001
θ	0°	8°	0°	8°
θ1	5°	1°	5°	1°