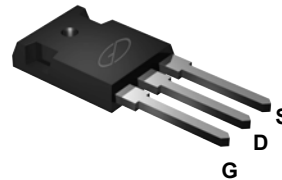
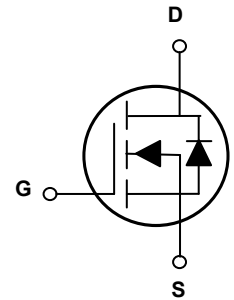


Main Product Characteristics

V_{DS}	85V
$R_{DS(ON)}$	2.0m Ω
I_D	320A



TO-247



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switch mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSGA08320 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°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	85	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	320	A
Drain Current-Continuous (T _C =100°C)	$I_D(100^\circ\text{C})$	245	A
Pulsed Drain Current	I_{DM}	1280	A
Maximum Power Dissipation	P_D	365	W
Derating Factor		2.43	W/°C
Single Pulse Avalanche Energy ⁵	E_{AS}	2850	mJ
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.41	°C/W
Operating Junction Temperature Range	T_J	-55 To +175	°C
Storage Temperature Range	T_{STG}	-55 To +175	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	85	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=85V, V_{GS}=0V$	-	-	1	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	3	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=160A$	-	1.6	2.0	m Ω
Gate Resistance	R_g		2	-	5	Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=160A$	-	210	-	S
Dynamic Characteristics⁴						
Input Capacitance	C_{iss}	$V_{DS}=40V, V_{GS}=0V, F=1MHz$	-	15800	-	pF
Output Capacitance	C_{oss}		-	2450	-	
Reverse Transfer Capacitance	C_{rss}		-	111	-	
Switching Characteristics⁴						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=40V, R_g=1.6\Omega, V_{GS}=10V, I_D=160A$	-	43	-	nS
Turn-On Rise Time	t_r		-	39	-	
Turn-Off Delay Time	$t_{d(off)}$		-	108	-	
Turn-Off Fall Time	t_f		-	40	-	
Total Gate Charge	Q_g	$V_{DS}=40V, I_D=160A, V_{GS}=10V$	-	245	-	nC
Gate-Source Charge	Q_{gs}		-	66	-	
Gate-Drain Charge	Q_{gd}		-	65	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ³	V_{SD}	$V_{GS}=0V, I_S=160A$	-	-	1.2	V
Diode Forward Current	I_S		-	-	320	A
Reverse Recovery Time	t_{rr}	$T_J=25^\circ\text{C}, I_F=160A, di/dt=100A/\mu s^3$	-	109	-	nS
Reverse Recovery Charge	Q_{rr}		-	315	-	nC

Notes:

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2.Surface Mounted on FR4 Board, $t \leq 10$ sec.
- 3.Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 4.Guaranteed by design
- 5.EAS condition : $T_J=25^\circ\text{C}, V_{DD}=40V, V_G=10V, L=0.5mH, R_g=25\Omega$.

Typical Electrical and Thermal Characteristic Curves

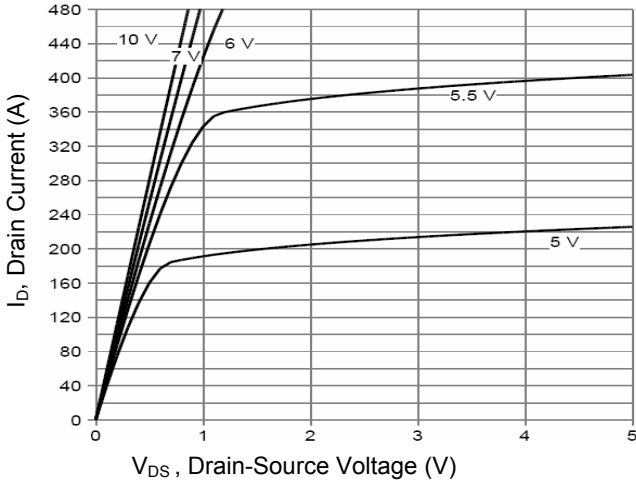


Figure 1. Output Characteristics

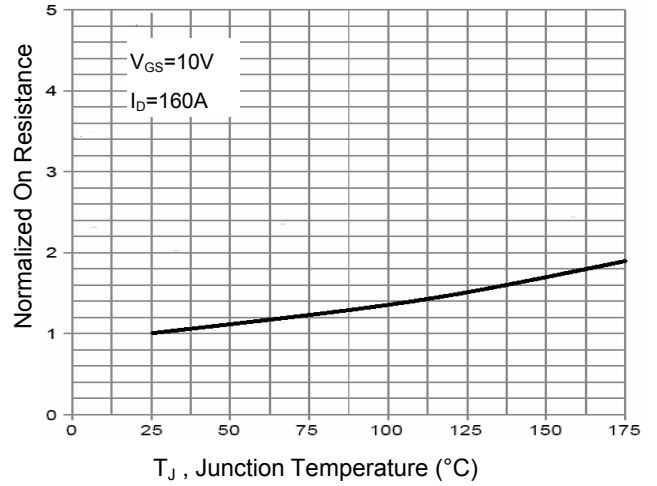


Figure 2. $R_{DS(on)}$ -Junction Temperature

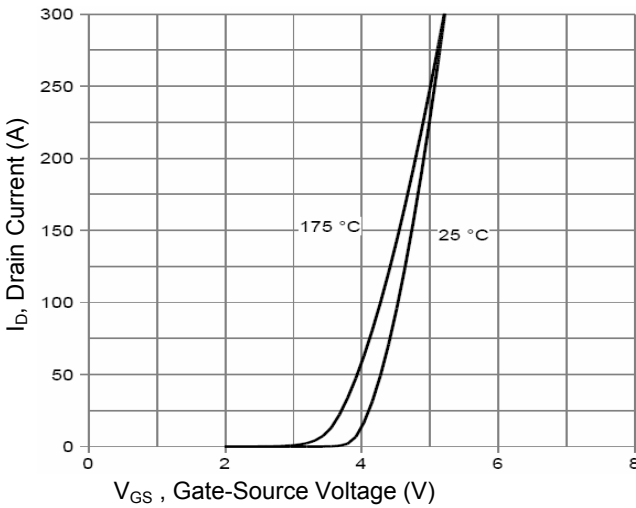


Figure 3. Transfer Characteristics

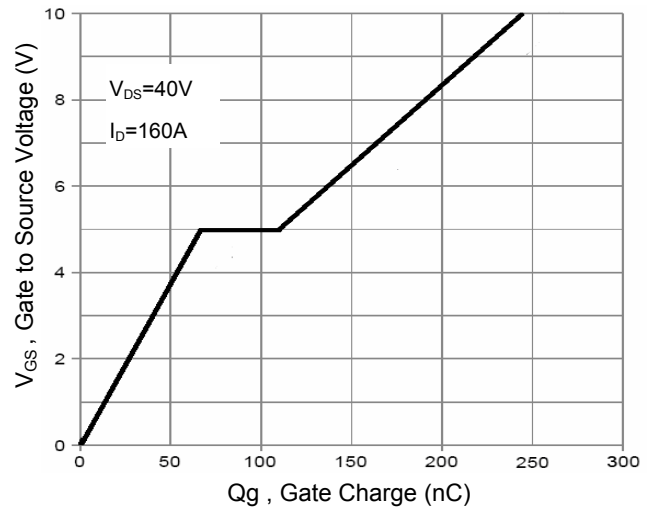


Figure 4. Gate Charge

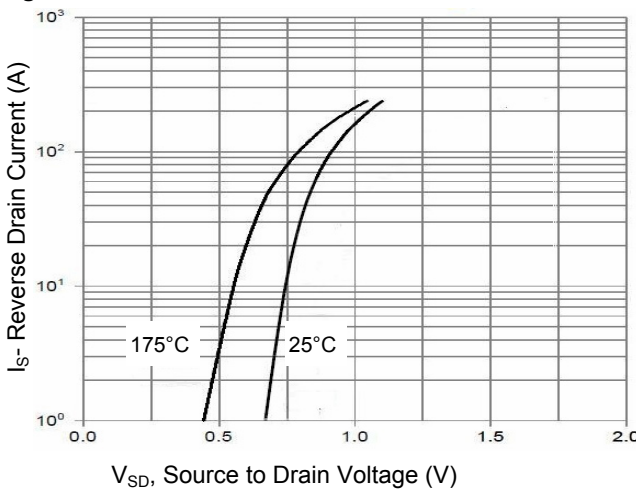


Figure 5. Source-Drain Diode Forward

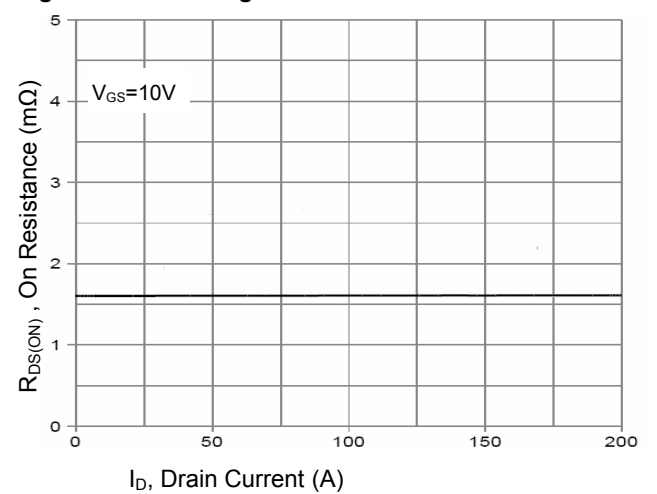


Figure 6. $R_{DS(on)}$ -Drain Current

Typical Electrical and Thermal Characteristic Curves

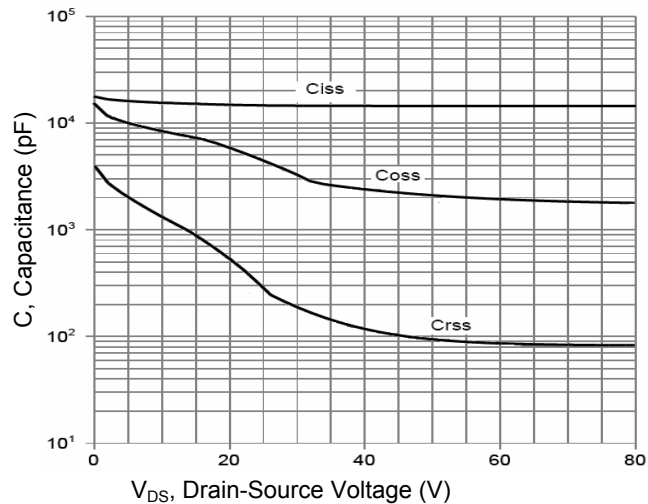


Figure 7. Capacitance vs. V_{DS}

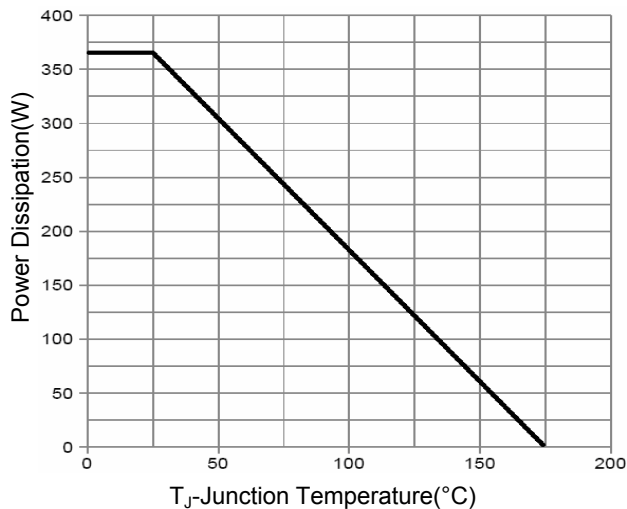


Figure 8. Power De-rating

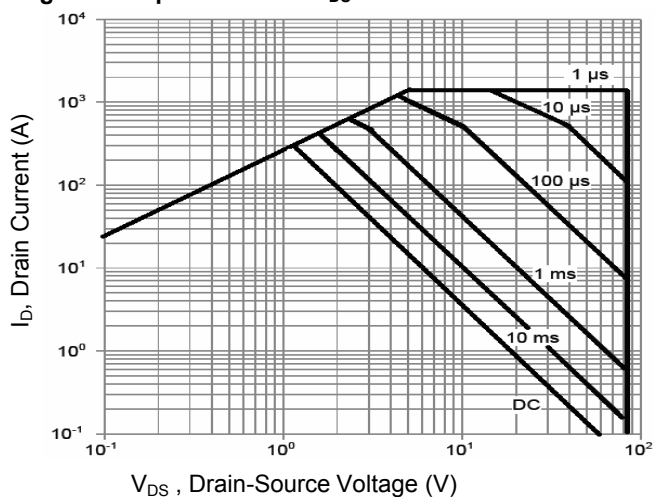


Figure 9. Safe Operation Area

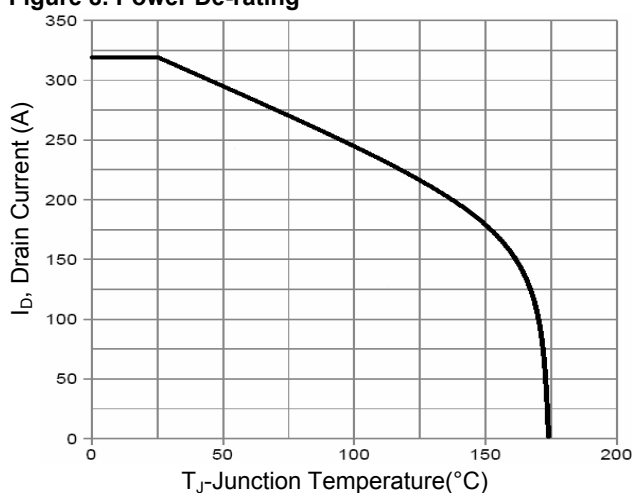


Figure 10. Current De-rating

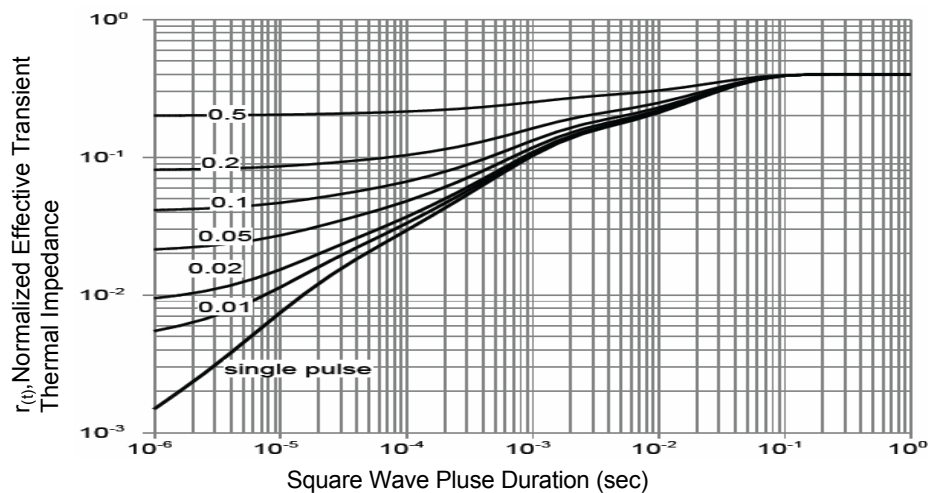
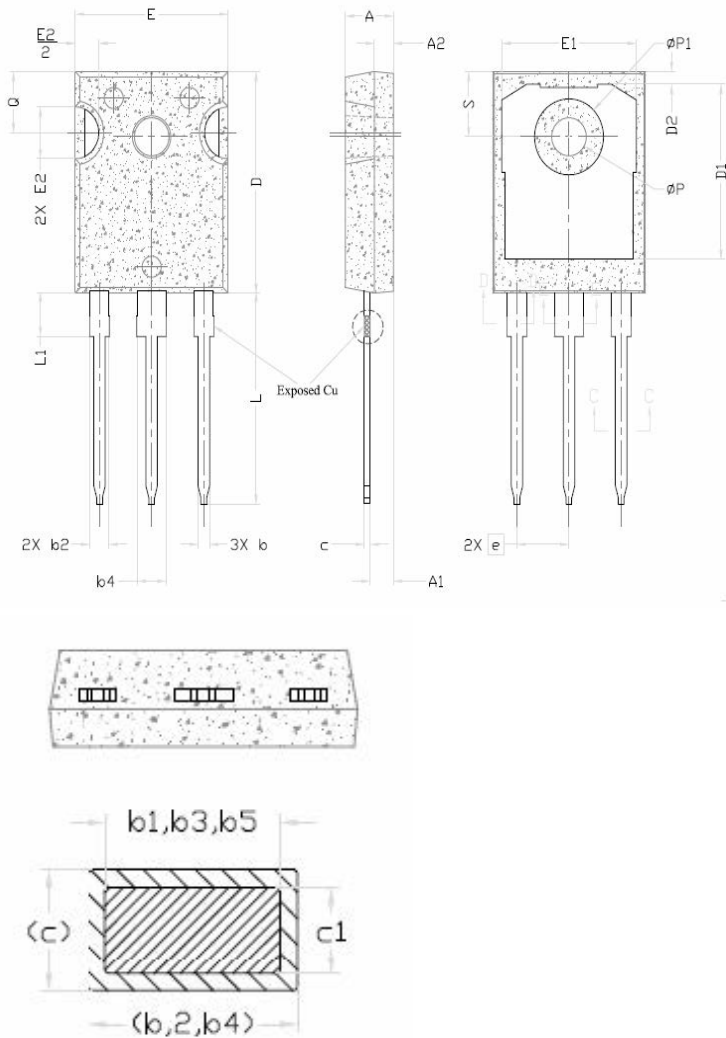


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Outline Dimensions (TO-247)



SYMBOL	DIMENSIONS			NOTES
	MIN.	NOM.	MAX.	
A	4.83	5.02	5.21	
A1	2.29	2.41	2.55	
A2	1.50	2.00	2.49	
b	1.12	1.20	1.33	
b1	1.12	1.20	1.28	
b2	1.91	2.00	2.39	6
b3	1.91	2.00	2.34	
b4	2.87	3.00	3.22	6, 8
b5	2.87	3.00	3.18	
c	0.55	0.60	0.69	6
c1	0.55	0.60	0.65	
D	20.80	20.95	21.10	4
D1	16.25	16.55	17.65	5
D2	0.51	1.19	1.35	
E	15.75	15.94	16.13	4
E1	13.46	14.02	14.16	5
E2	4.32	4.91	5.49	3
e	5.44BSC			
L	19.81	20.07	20.32	
L1	4.10	4.19	4.40	6
ØP	3.56	3.61	3.65	7
ØP1	7.19REF.			
Q	5.39	5.79	6.20	
S	6.04	6.17	6.30	