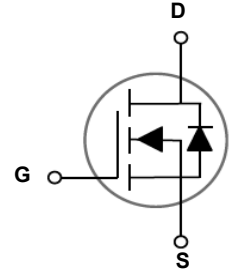


### Main Product Characteristics

$V_{DS}$	100V
$R_{DS(ON)}$	7.6m $\Omega$
$I_D$	65A



TO-220F



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 GSGU1066 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	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	+20/-12	V
Drain Current-Continuous( $T_C=25^\circ\text{C}$ )	$I_D$	65	A
Drain Current-Continuous( $T_C=100^\circ\text{C}$ )		41	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	260	A
Single Pulse Avalanche Energy <sup>2</sup>	$E_{AS}$	231	mJ
Single Pulse Avalanche Current <sup>2</sup>	$I_{AS}$	68	A
Power Dissipation( $T_C=25^\circ\text{C}$ )	$P_D$	50	W
Power Dissipation-De-rate above $25^\circ\text{C}$		0.40	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.5	$^\circ\text{C}/\text{W}$
Storage Temperature Range	$T_{STG}$	-55 To +150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 To +150	$^\circ\text{C}$

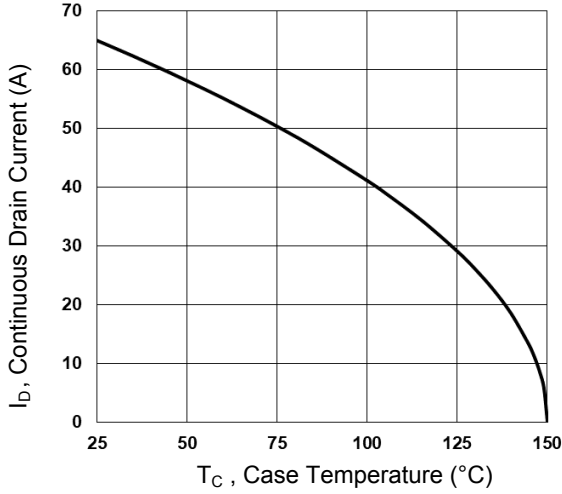

**Electrical Characteristics** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=1mA$	-	0.049	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=100V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=80V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=+20V, V_{DS}=0V$	-	-	100	nA
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=18A$	-	6.3	7.6	m $\Omega$
		$V_{GS}=4.5V, I_D=10A$	-	8.8	11.4	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	1	1.5	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	-5.5	-	mV/ $^\circ\text{C}$
Forward Transconductance	$g_{fs}$	$V_{DS}=10V, I_D=3A$	-	15	-	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	$Q_g$	$V_{DS}=80V, I_D=10A,$ $V_{GS}=10V$	-	53.5	80	nC
Gate-Source Charge <sup>3,4</sup>	$Q_{gs}$		-	7.5	12	
Gate-Drain Charge <sup>3,4</sup>	$Q_{gd}$		-	13.3	20	
Turn-On Delay Time <sup>3,4</sup>	$t_{d(on)}$	$V_{DD}=50V, R_G=6\Omega,$ $V_{GS}=10V, I_D=1A$	-	14.6	30	nS
Rise Time <sup>3,4</sup>	$t_r$		-	32.8	66	
Turn-Off Delay Time <sup>3,4</sup>	$t_{d(off)}$		-	62.2	125	
Fall Time <sup>3,4</sup>	$t_f$		-	28.4	56	
Input Capacitance	$C_{iss}$	$V_{DS}=25V, V_{GS}=0V,$ $F=1MHz$	-	3250	6500	pF
Output Capacitance	$C_{oss}$		-	867	1730	
Reverse Transfer Capacitance	$C_{rss}$		-	58	116	
Gate Resistance	$R_g$	$V_{GS}=0V, V_{DS}=0V,$ $F=1MHz$	-	1.25	-	$\Omega$
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	80	A
Pulsed Source Current	$I_{SM}$		-	-	160	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=1A,$ $T_J=25^\circ\text{C}$	-	-	1	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V, I_S=50A,$ $di/dt=100A/\mu s, T_J=25^\circ\text{C}$	-	58	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	85	-	nC

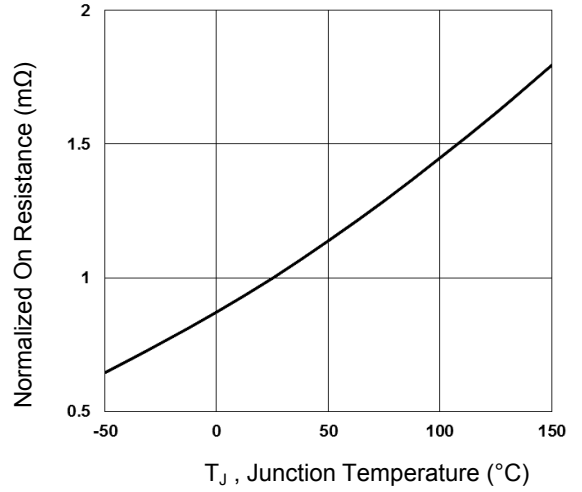
Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2.  $V_{DD}=50V, V_{GS}=10V, L=0.1mH, I_{AS}=68A, R_G=25\Omega$  Starting  $T_J=25^\circ\text{C}$
3. The data tested by pulsed , pulse width 300us , duty cycle 2%.
4. Essentially independent of operating temperature.

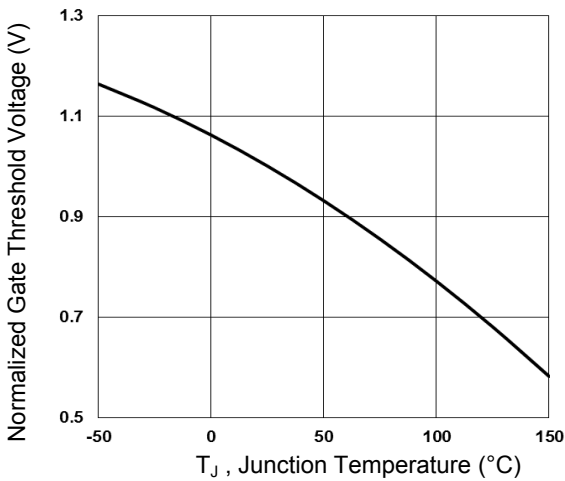
### Typical Electrical and Thermal Characteristic Curves



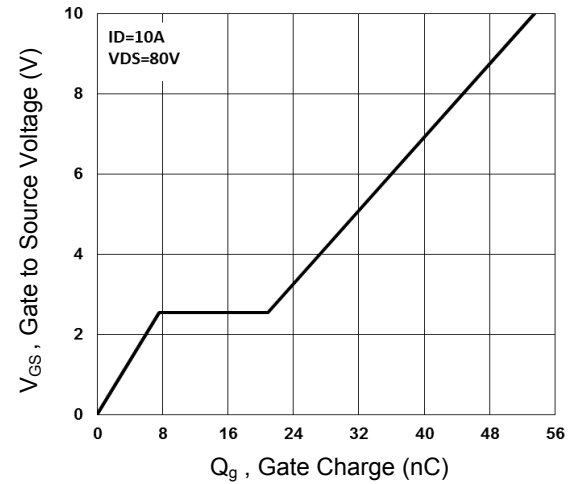
**Figure 1. Continuous Drain Current vs.  $T_C$**



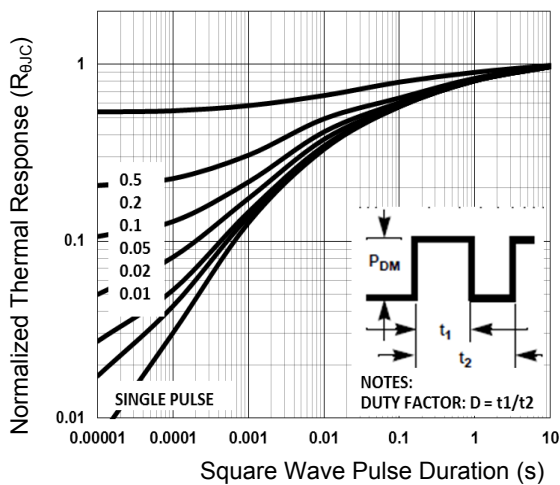
**Figure 2. Normalized  $R_{DSON}$  vs.  $T_J$**



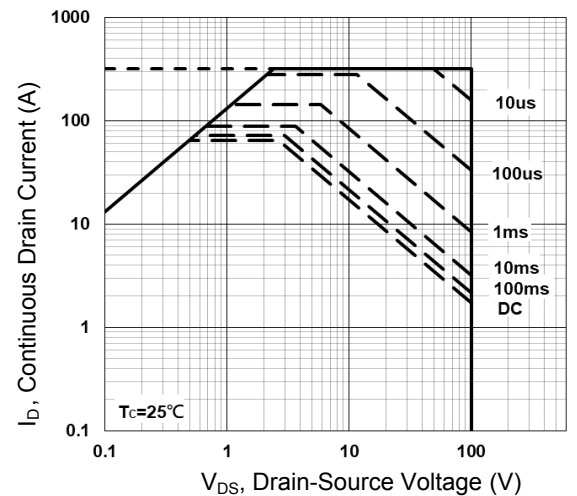
**Figure 3. Normalized  $V_{TH}$  vs.  $T_J$**



**Figure 4. Gate Charge Characteristics**

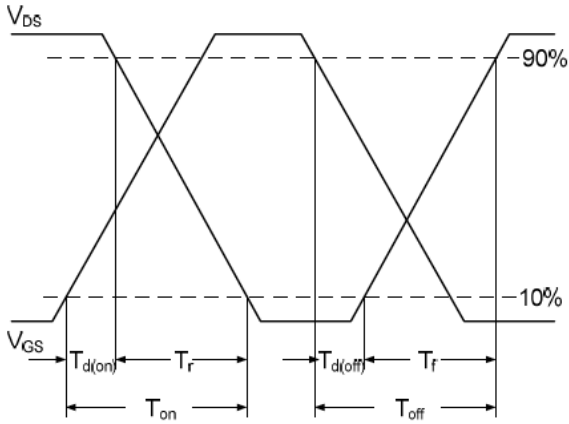


**Figure 5. Normalized Transient Impedance**

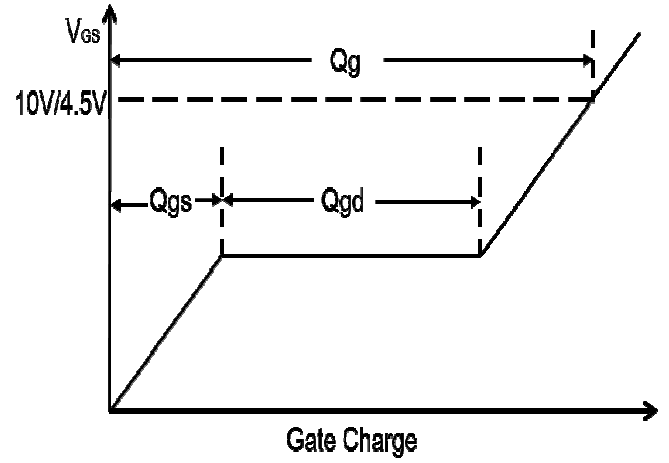


**Figure 6. Safe Operation Area**

**Typical Electrical and Thermal Characteristic Curves**

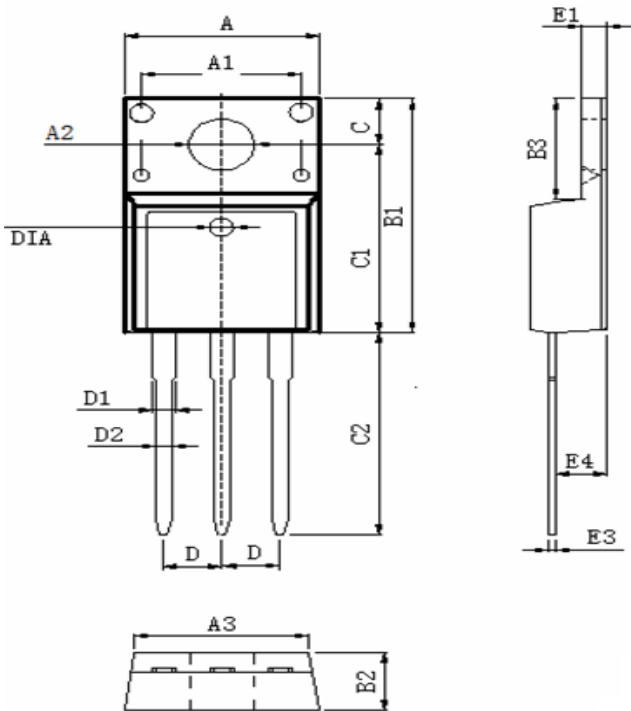


**Figure 7. Switching Time Waveform**



**Figure 8. Gate Charge Waveform**

**Package Outline Dimensions (TO-220F)**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.460	9.860	0.412	0.388
A1	7.100	6.900	0.280	0.272
A2	3.500	3.100	0.138	0.122
A3	9.900	9.500	0.390	0.374
B1	16.170	15.570	0.637	0.613
B2	4.900	4.500	0.193	0.177
B3	6.880	6.480	0.271	0.255
C	3.500	3.100	0.138	0.122
C1	12.870	12.270	0.507	0.483
C2	13.380	12.580	0.527	0.495
D	2.590	2.490	0.102	0.098
D1	1.470	1.070	0.058	0.042
D2	0.900	0.700	0.035	0.028
E1	2.740	2.340	0.108	0.092
E3	0.600	0.400	0.024	0.016
E4	2.960	2.560	0.117	0.101
DIA	Φ1.5 TYP.	deep0.1 TYP.	Φ0.059 TYP.	deep0.004 TYP.