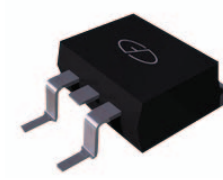
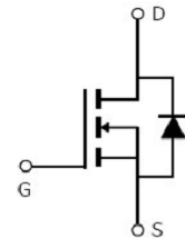


## Main Product Characteristics

$V_{DSS}$	150V
$R_{DS(on)}$	7.2m $\Omega$
$I_D$	140A



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



Schematic Diagram

## Features and Benefits

- Excellent gate charge
- Low R<sub>ds(on)</sub>
- Ideal for high-frequency switching
- Low conduction and switching power loss



## Description

The GSGT15140 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<sub>C</sub>=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	150	V
Gate-Source Voltage	$V_{GS}$	±20	V
Drain Current-Continuous	$I_D$	140	A
Drain Current-Continuous(T <sub>C</sub> =100°C)	$I_D(100^\circ\text{C})$	100	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	560	A
Maximum Power Dissipation	$P_D$	320	W
Derating Factor		2.1	W/°C
Single pulse avalanche energy <sup>5</sup>	$E_{AS}$	1296	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 175	°C
Thermal Resistance, Junction-to-Case <sup>2</sup>	$R_{\theta JC}$	0.47	°C/W

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

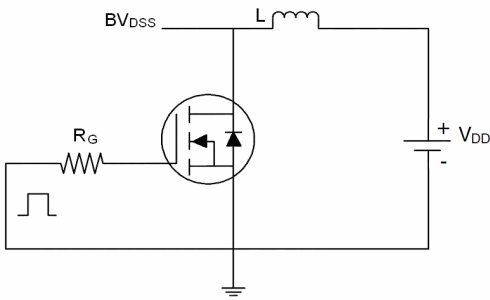
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	150	155	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=150V, V_{GS}=0V$		-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$		-	$\pm 100$	nA
<b>On Characteristics</b> <sup>3</sup>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	3.3	4.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=70A$		6	7.2	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=10V, I_D=70A$		-	-	S
<b>Dynamic Characteristics</b> <sup>4</sup>						
Input Capacitance	$C_{iss}$	$V_{DS}=75V, V_{GS}=0V,$ $F=1.0MHz$	-	5500	-	PF
Output Capacitance	$C_{oss}$		-	600	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	7	-	PF
<b>Switching Characteristics</b> <sup>4</sup>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=75V, I_D=70A$ $V_{GS}=10V, R_G=4.7\Omega$	-	26	-	nS
Turn-on Rise Time	$t_r$		-	36	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	47	-	nS
Turn-Off Fall Time	$t_f$		-	15	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=75V, I_D=70A,$ $V_{GS}=10V$	-	74		nC
Gate-Source Charge	$Q_{gs}$		-	32		nC
Gate-Drain Charge	$Q_{gd}$		-	11		nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$V_{GS}=0V, I_F=I_S$	-		1.2	V
Diode Forward Current <sup>2</sup>	$I_S$		-	-	140	A
Reverse Recovery Time	$t_{rr}$	$T_J = 25^\circ\text{C}, I_F = I_S$ $di/dt = 100A/\mu s^3$		146		nS
Reverse Recovery Charge	$Q_{rr}$		-	485		nC

**Notes:**

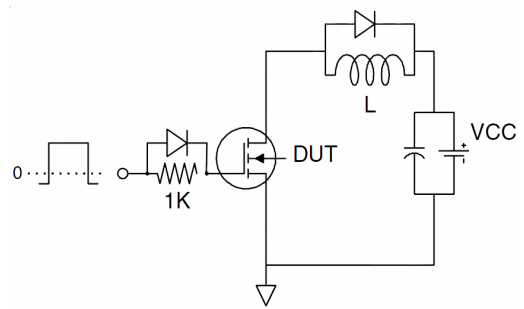
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed only by design.
5. EAS condition :  $T_J=25^\circ\text{C}, V_{DD}=50V, V_G=10V, L=0.5mH, R_G=25\Omega$

**Test Circuits and Waveforms**

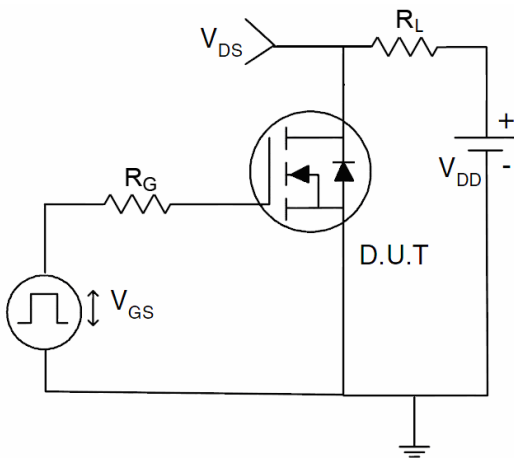
**EAS Test Circuit:**



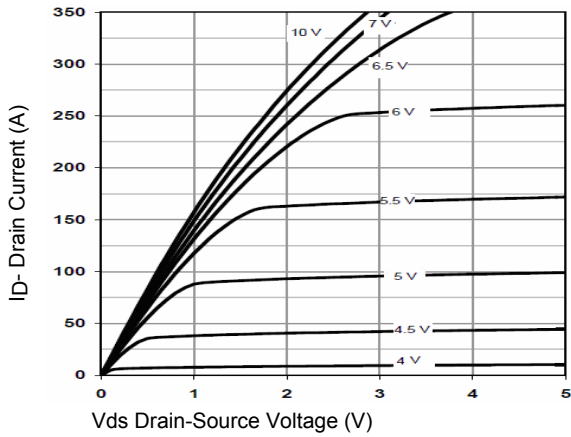
**Gate charge test circuit:**



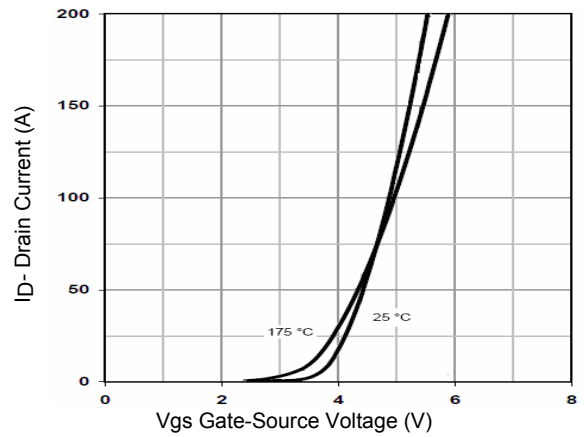
**Switching Time Test Circuit:**



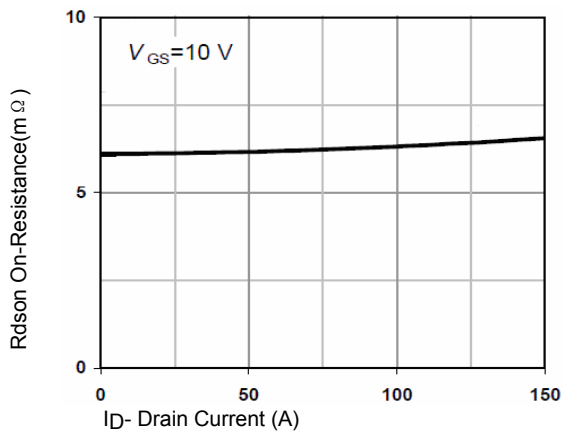
**Typical Electrical and Thermal Characteristic Curves**



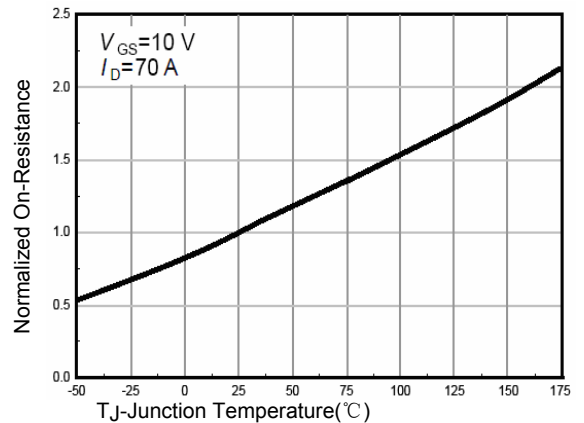
**Figure 1. Output Characteristics**



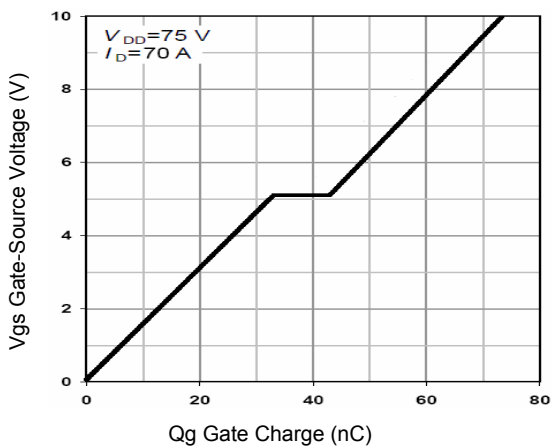
**Figure 2. Transfer Characteristics**



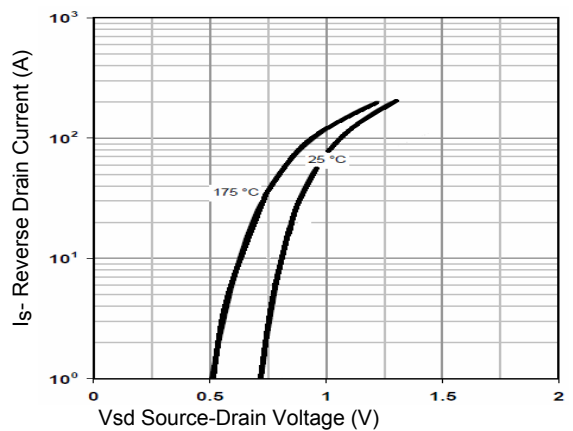
**Figure 3. Rdson- Drain Current**



**Figure 4. Rdson-Junction Temperature**

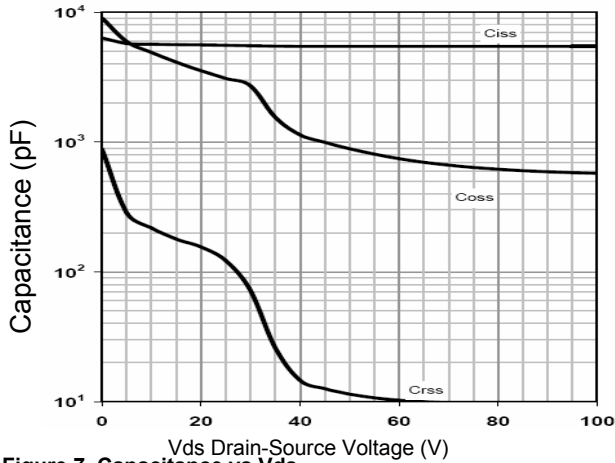


**Figure 5. Gate Charge**

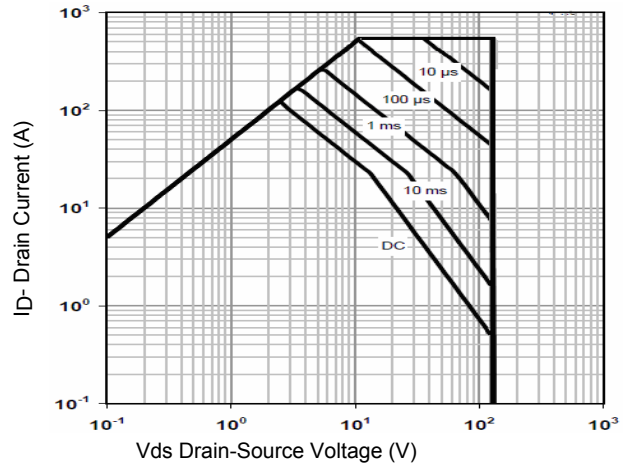


**Figure 6. Source- Drain Diode Forward**

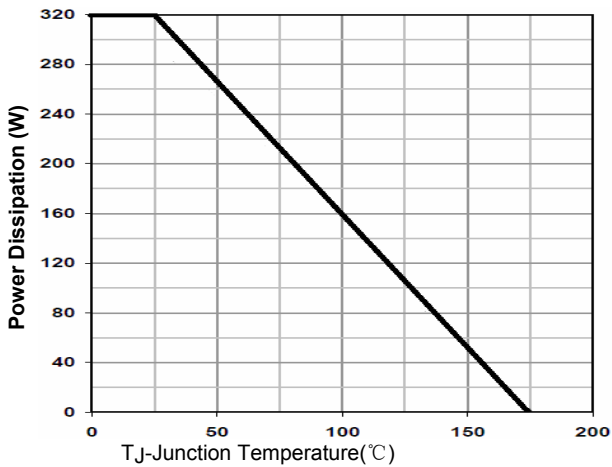
**Typical Electrical and Thermal Characteristic Curves**



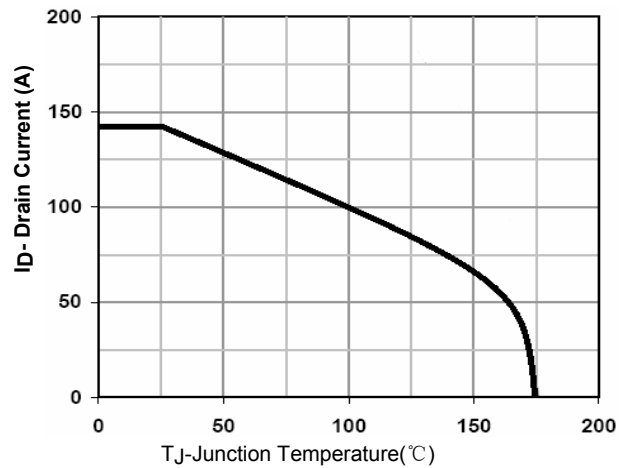
**Figure 7. Capacitance vs Vds**



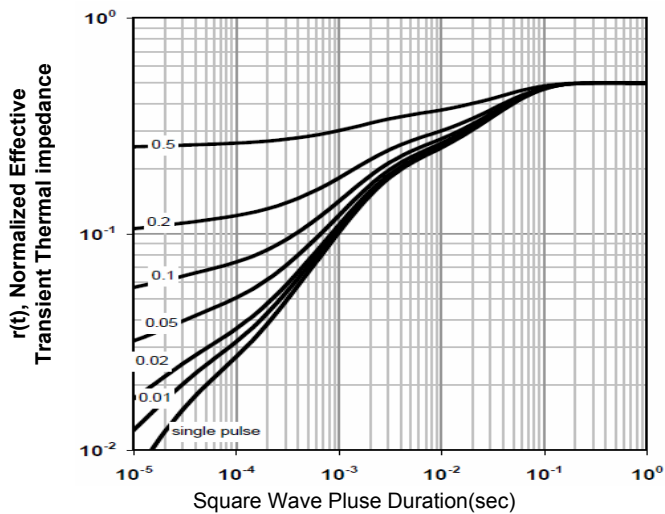
**Figure 8. Safe Operation Area**



**Figure 9. Power De-rating**



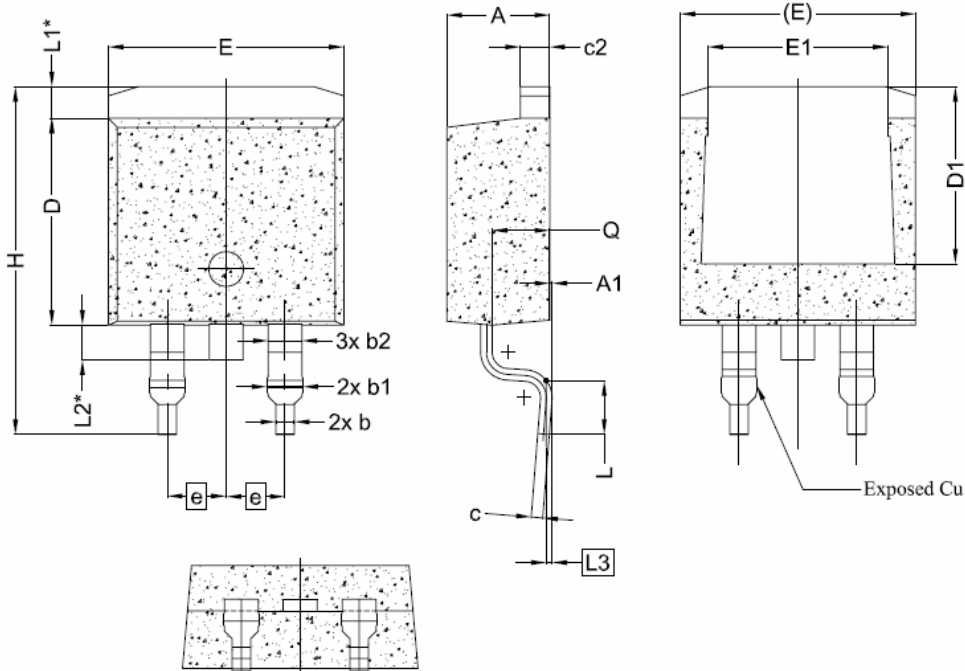
**Figure 10. Current De-rating**



**Figure 11. Normalized Maximum Transient Thermal Impedance**

**Package Outline Dimensions**

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



Symbol	Dimensions In Millimeters		
	Min.	Nom.	Max.
A	4.24	4.44	4.64
A1	0.00	0.10	0.25
b	0.70	0.80	0.90
b1	1.20	1.55	1.75
b2	1.20	1.45	1.70
c	0.40	0.50	0.60
c2	1.15	1.27	1.40
D	8.82	8.92	9.02
D1	6.86	7.65	-
E	9.96	10.16	10.36
E1	6.89	7.77	7.89
e	2.54BSC		
H	14.61	15.00	15.88
L	1.78	2.32	2.79
L1	1.36 REF.		
L2	1.50 REF.		
L3	0.25 BSC		
Q	2.30	2.48	2.70