

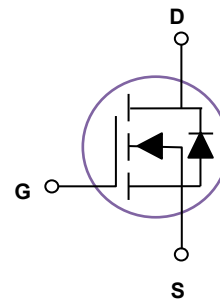
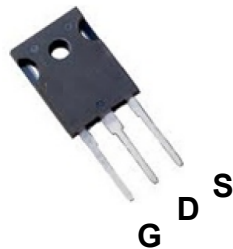
General Description

These N-Channel enhancement mode power field effect transistors are using SGT technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

Features

V_{DS}	100V
I_D (at $V_{GS}=10V$)	364A
$R_{DS(ON)}$ (at $V_{GS}=10V$)	1.8m Ω (Typ)

TO-247



Absolute Maximum Ratings $T_A=25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Maximum	Units	
Drain-Source Voltage	V_{DS}	100	V	
Gate-Source Voltage	V_{GS}	± 20	V	
Drain Current-Continuous	TC=25 $^\circ\text{C}$	I_D	364	A
	TC=100 $^\circ\text{C}$	I_D	230	A
Maximum Power Dissipation	P_D	596	W	
Single pulse avalanche energy	E_{AS}	1225	mJ	
Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ\text{C}$	

Thermal Characteristics

Parameter	Symbol	Typ	Max	Unit
Thermal Resistance junction-case	$R_{\theta Jc}$		0.21	$^\circ\text{C}/\text{W}$
Thermal Resistance junction-to-Ambient	$R_{\theta JA}$		62.5	$^\circ\text{C}/\text{W}$

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Condition	Min	Typ	Max	Unit
STATIC PARAMETERS						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.0	3.0	4.0	V
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =50A		1.8	2.3	mΩ
DYNAMIC PARAMETERS						
C _{iSS}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, F=1.0MHz		11260		pF
C _{oSS}	Output Capacitance			1715		pF
C _{rSS}	Reverse Transfer Capacitance			328		pF
SWITCHING PARAMETERS						
t _{d(on)}	Turn-on Delay Time	V _{DD} =50V, I _D =20A, V _{GS} =10V, R _G =6Ω		34		nS
t _r	Turn-on Rise Time			26		nS
t _{d(off)}	Turn-Off Delay Time			78		nS
t _f	Turn-Off Fall Time			30		nS
Q _g	Total Gate Charge	V _{DS} =50V, I _D =10A, V _{GS} =10V		220		nC
Q _{gs}	Gate-Source Charge			80		nC
Q _{gd}	Gate-Drain Charge			38		nC
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =1A			1.2	V

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=180A, Starting T_J=25°C
3. The data tested by pulsed , pulse width ≅ 300us , duty cycle ≅ 2%.
4. Essentially independent of operating temperature.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

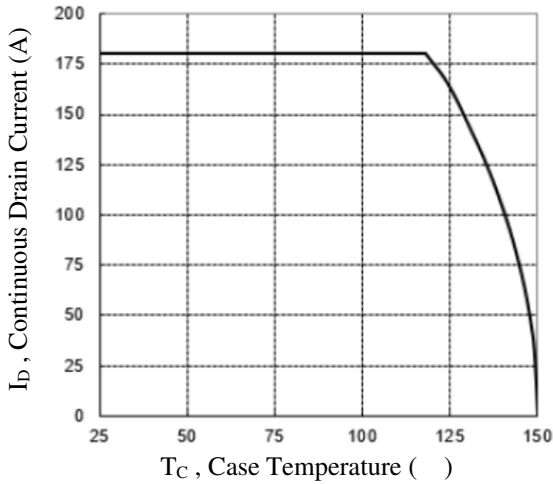


Fig.1 Continuous Drain Current vs. T_c

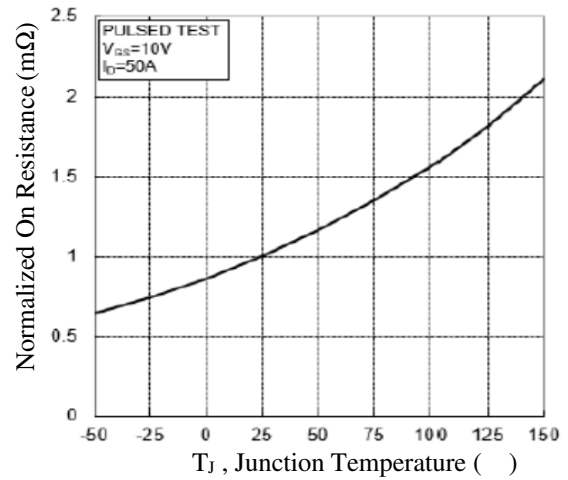


Fig.2 Normalized $R_{DS(on)}$ vs. T_j

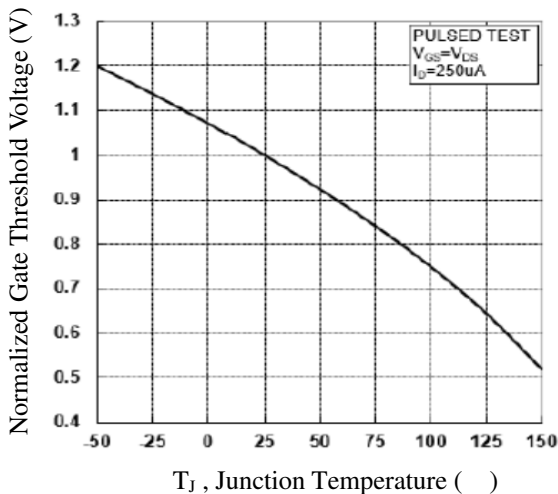


Fig.3 Normalized V_{th} vs. T_j

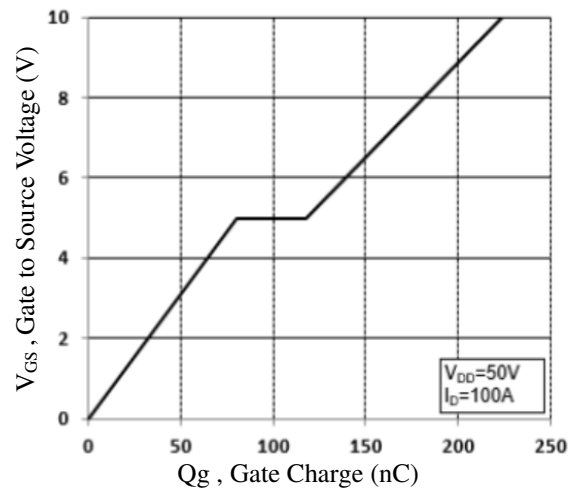


Fig.4 Gate Charge Characteristics

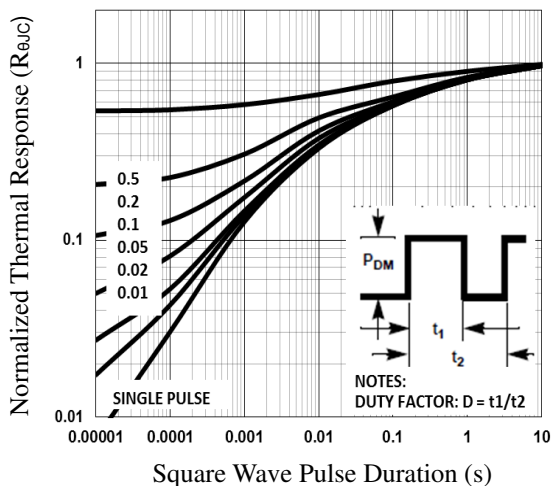


Fig.5 Normalized Transient Impedance

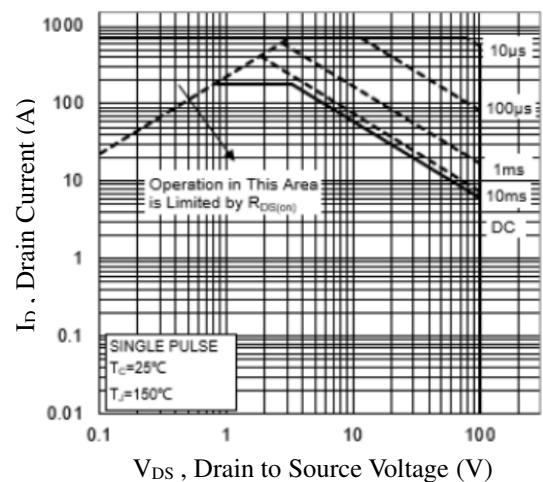


Fig.6 Maximum Safe Operation Area

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

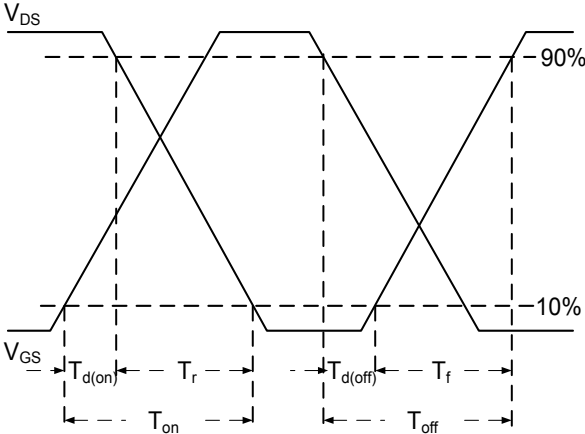


Fig.7 Switching Time Waveform

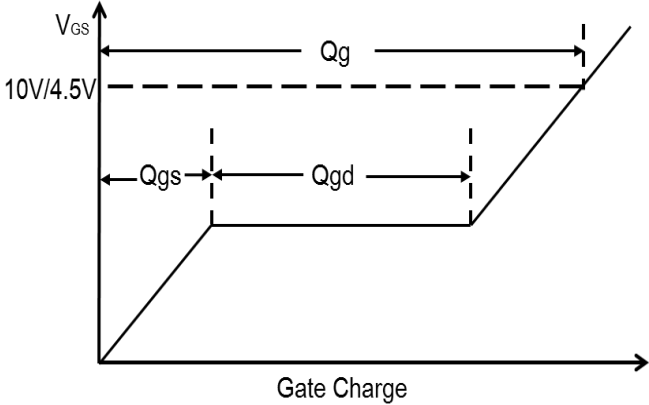
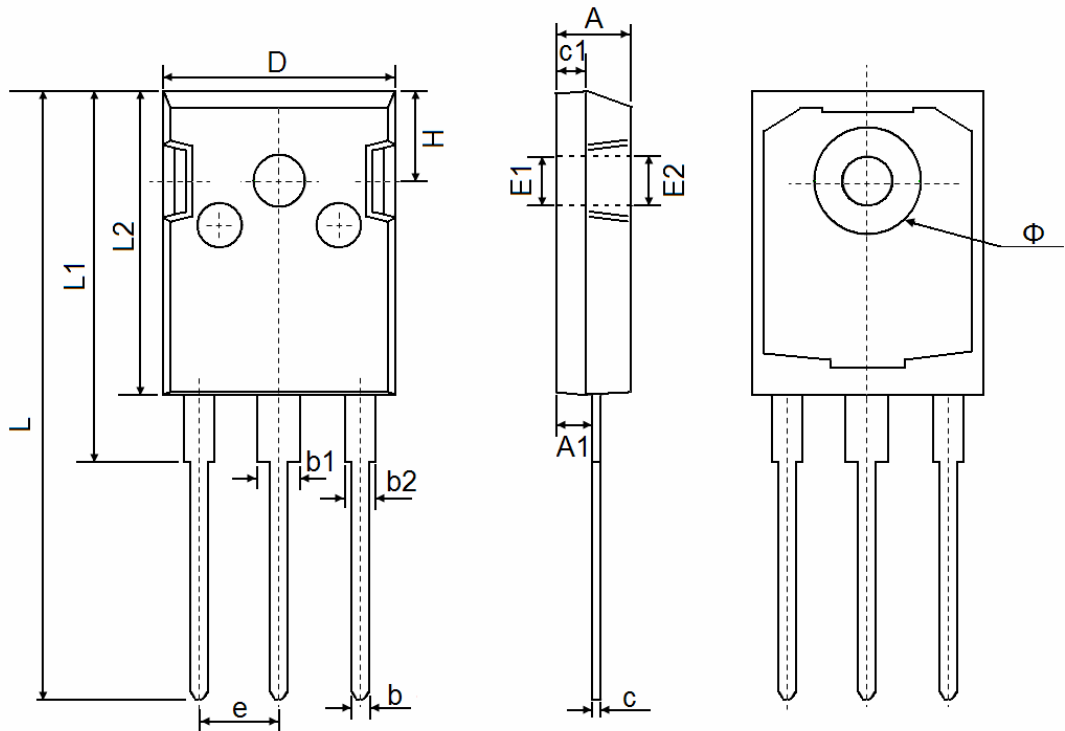


Fig.8 Gate Charge Waveform

TO-247 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.850	5.150	0.191	0.200
A1	2.200	2.600	0.087	0.102
b	1.000	1.400	0.039	0.055
b1	2.800	3.200	0.110	0.126
b2	1.800	2.200	0.071	0.087
c	0.500	0.700	0.020	0.028
c1	1.900	2.100	0.075	0.083
D	15.450	15.750	0.608	0.620
E1	3.500 REF		0.138 REF	
E2	3.600 REF		0.142 REF	
L	40.900	41.300	1.610	1.626
L1	24.800	25.100	0.976	0.988
L2	20.300	20.600	0.799	0.811
Φ	7.100	7.300	0.280	0.287
e	5.450 TYP		0.215 TYP	
H	5.980 REF		0.235 REF	