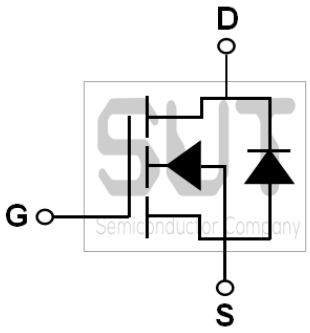
Version 1.0 Date 2019.03.27 Datasheet

N-Channel 80-$V_{(D-S)}$ SGT MOSFET

PRODUCT SUMMARY		
B_{VDSS}(V)	$R_{DS(on)}$ (mΩ)(MAX)	I_D(A)
80	3.9@V_{GS}=10V	120

TO220 Pin Configuration



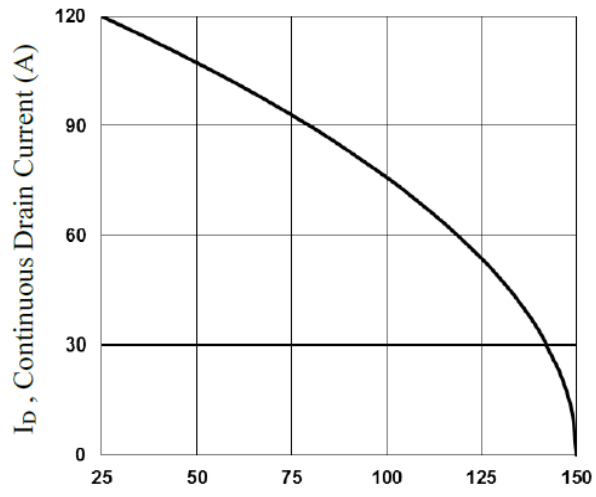
ABSOLUTE MAXIMUM RATINGS(T_C=25℃ UNLESS OTHERWISE NOTED)			
Parameter	**Symbol**	**Rating**	**Units**
Drain-Source Voltage	V_{DS}	80	V
Gate-Source Voltage	V_{GS}	+20/-12	V
Drain Current-Continuous (T_C=25℃)	I_D	120	A
Drain Current-Continuous (T_C=100℃)		76	A
Drain Current-Pulsed[1]	I_{DM}	480	A
Single Pulse Avalanche Energy[2]	EAS	245	mJ
Single Pulse Avalanche Current[2]	IAS	70	A
Power Dissipation (T_C=25℃)	P_D	184	W
Power Dissipation-Derate above 25℃		1.47	W/℃
Storage Temperature Range	T_{STG}	-50 to 150	℃
Operating Junction Temperature Range	T_J	-50 to 150	℃

THERMAL CHARACTERISTICS				
Parameter	**Symbol**	**Typ.**	**Max.**	**Unit**
Thermal Resistance Junction to ambient	$R_{\theta JA}$	---	62	℃/W
Thermal Resistance Junction to Case	$R_{\theta JC}$	---	0.68	℃/W

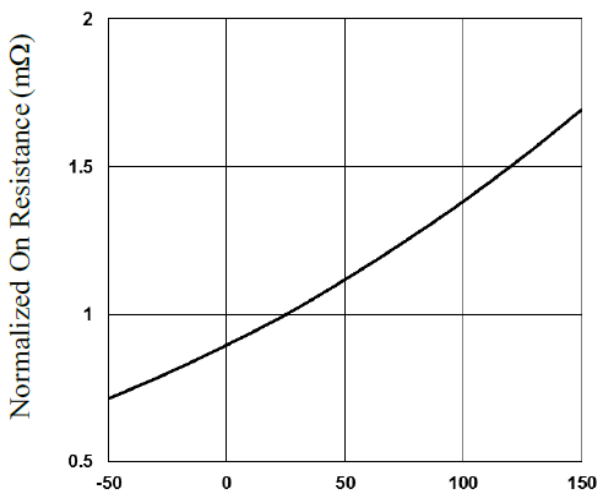
ELECTRICAL CHARACTERISTICS (T_J=25℃ UNLESS OTHERWISE NOTED)						
Parameter	**Symbol**	**Test Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	80	---	---	V
BV_{DSS}Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃,I_D=1mA	---	0.03	---	V/℃
Drain-Source Leakage Current	I_{DSS}	V_{GS}=0V,V_{DS}=80V,T_J=25℃	---	---	1	uA
		V_{GS}=0V,V_{DS}=64V,T_J=85℃	---	---	10	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=20V , V_{DS}=0V	---	---	100	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=20A	---	3.2	3.9	mΩ
		V_{GS}=4.5V , I_D=10A	---	4.6	6.2	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D =250uA	1.0	1.6	2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	-5.8	---	mV/℃
Forward Transconductance	gfs	V_{DS}=10V , I_D=5A	---	10	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[3 , 4]	Q_g	V_{GS}=10V , V_{DS}=64V , I_D=10A	---	88	132	nC
Gate-Source Charge[3 , 4]	Q_{gs}		---	10.2	15	
Gate-Drain Charge[3 , 4]	Q_{gd}		---	24	32	
Turn-On Delay Time[3 , 4]	$T_{d(on)}$	V_{GS}=10V , V_{DD}=40V , R_G=6Ω , I_D=1A	---	20	40	ns
Rise Time[3 , 4]	T_r		---	13	26	
Turn-Off Delay Time[3 , 4]	$T_{d(off)}$		---	36	72	
Fall Time[3 , 4]	T_f		---	18	36	
Input Capacitance	C_{iss}	V_{GS}=0V , V_{DS}=25V , F=1MHz	---	5160	10200	pF
Output Capacitance	C_{oss}		---	1346	2700	
Reverse Transfer Capacitance	C_{rss}		---	40	80	
Gate resistance	R_g	V_{GS}=0V,V_{DS}=0V,F=1MHz	---	1.65	---	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V,Force Current	---	---	120	A
Pulsed Source Current	I_{SM}		---	---	240	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.0	V

Note :

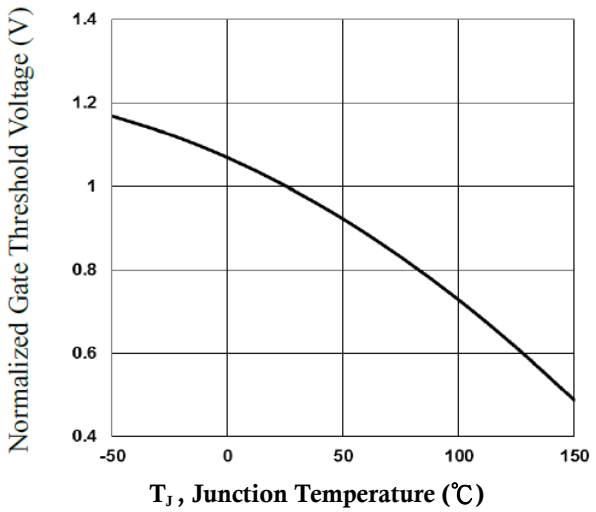
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{GS}=10V , V_{DD}=25V , L=0.1mH , I_{AS}=70A , R_G=25Ω , Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.



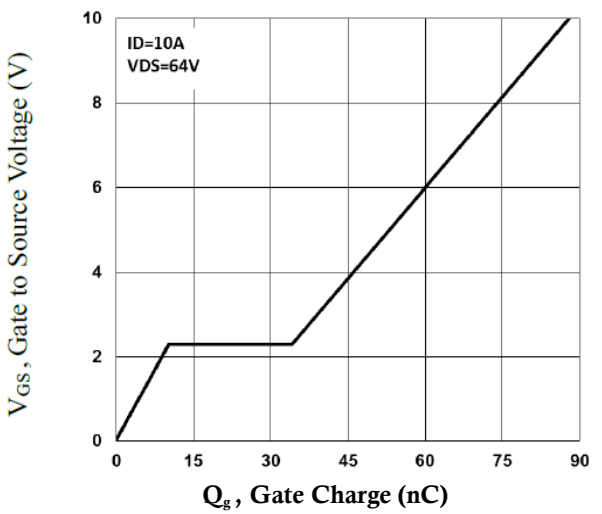
Continuous Drain Current vs. T_C



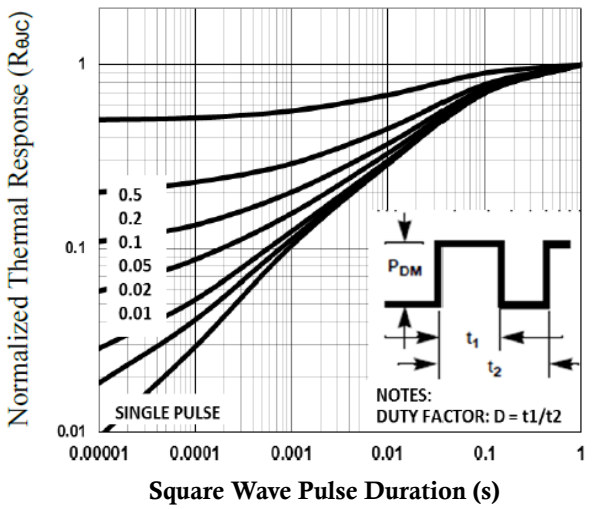
Normalized $R_{DS(ON)}$ vs. T_J



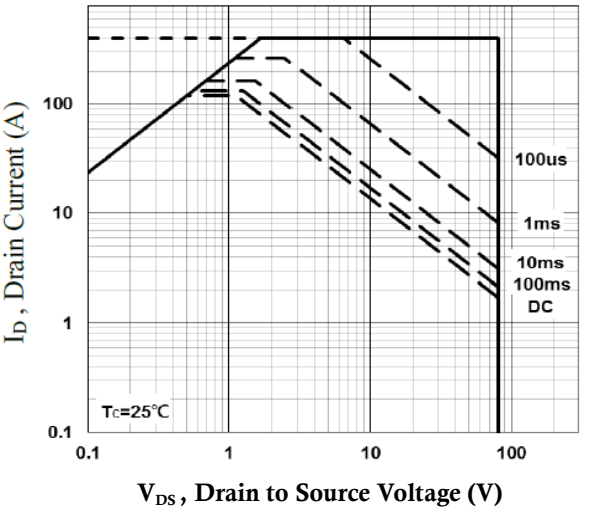
Normalized V_{th} vs. T_J



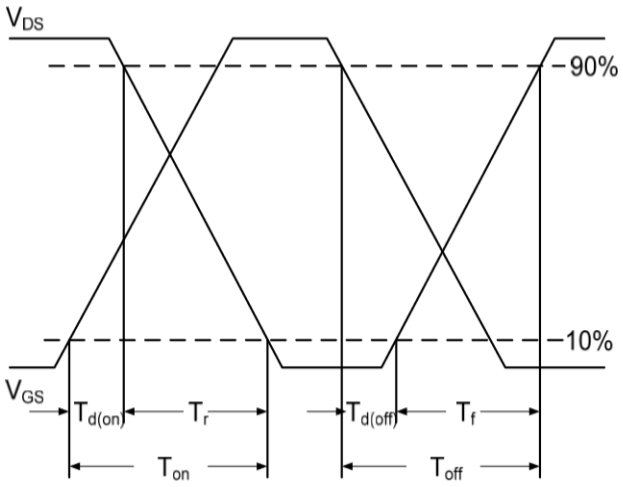
Gate Charge Characteristics



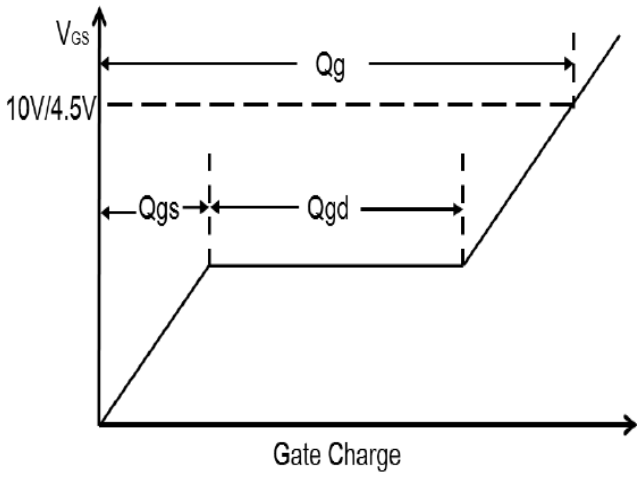
Normalized Transient Impedance



Maximum Safe Operation Area

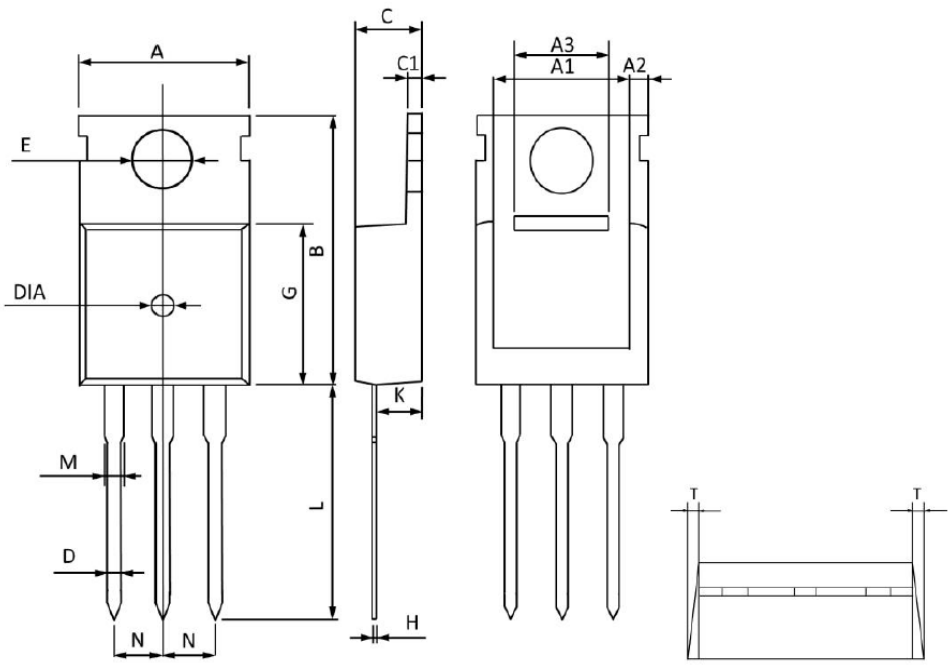


Switching Time Waveform



Gate Charge Waveform

TO220 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	10.300	9.700	0.406	0.382
A1	8.840	8.440	0.348	0.332
A2	1.250	1.050	0.049	0.041
A3	5.300	5.100	0.209	0.201
B	16.200	15.400	0.638	0.606
C	4.680	4.280	0.184	0.169
C1	1.500	1.100	0.059	0.043
D	1.000	0.600	0.039	0.024
E	3.800	3.400	0.150	0.134
G	9.300	8.700	0.366	0.343
H	0.600	0.400	0.024	0.016
K	2.700	2.100	0.106	0.083
L	13.600	12.800	0.535	0.504
M	1.500	1.100	0.059	0.043
N	2.590	2.490	0.102	0.098
T	W0.350		W0.014	
DIA	Ø1.500(TYP)	Deep0.200(TYP)	Ø0.059(TYP)	Deep0.008(TYP)