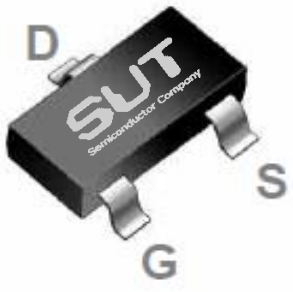
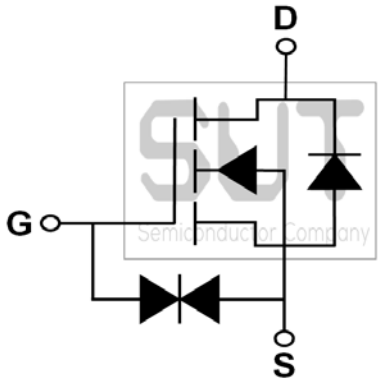
Version 1.0 Date 2019.03.27 Datasheet

N-Channel 60-$V_{(D-S)}$ MOSFET

PRODUCT SUMMARY		
B_{VDSS}(V)	$R_{DS(on)}$ (mΩ)(MAX)	I_D(A)
60	1.2@V_{GS}=10V	0.3

SOT23 Pin Configuration





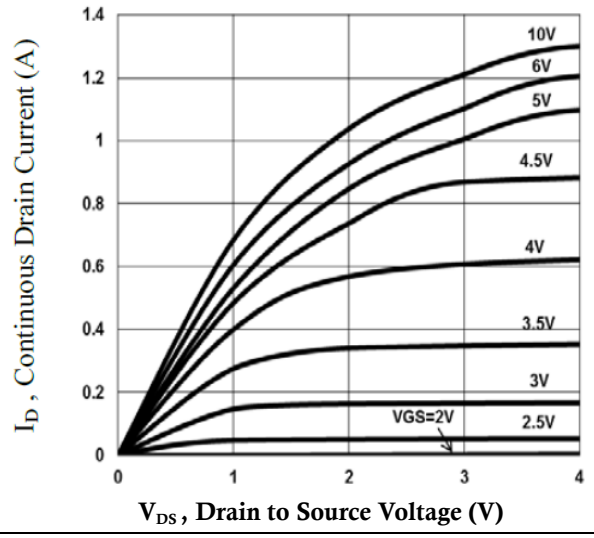
ABSOLUTE MAXIMUM RATINGS(T_C=25℃ UNLESS OTHERWISE NOTED)			
Parameter	**Symbol**	**Rating**	**Units**
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25℃)	I_D	0.3	A
Drain Current-Continuous (T_C=100℃)		0.2	A
Drain Current-Pulsed[1]	I_{DM}	1.2	A
Power Dissipation (T_C=25℃)	P_D	0.35	W
Power Dissipation-Derate above 25℃		0.003	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	$R_{\theta JA}$	---	357	℃/W

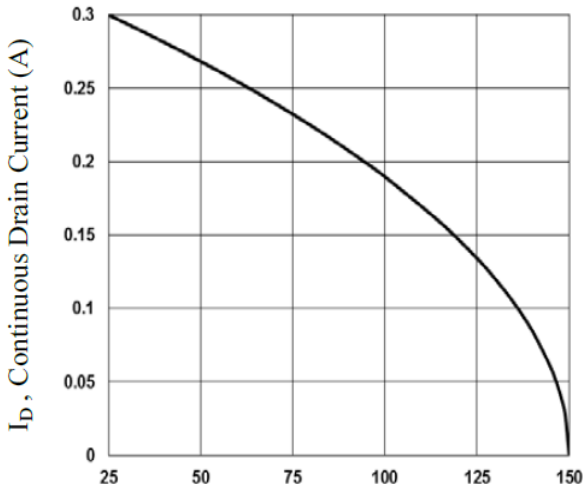
ELECTRICAL CHARACTERISTICS (T_J=25℃ UNLESS OTHERWISE NOTED)						
Parameter	**Symbol**	**Test Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=250uA	60	---	---	V
BV_{DSS}Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃,I_D=1mA	---	0.04	---	V/℃
Drain-Source Leakage Current	I_{DSS}	V_{GS}=0V,V_{DS}=60V,T_J=25℃	---	---	1	uA
		V_{GS}=0V,V_{DS}=48V,T_J=125℃	---	---	100	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V , V_{DS}=0V	---	---	±10	nA
On Characteristics						
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V , I_D=0.5A	---	0.9	1.2	mΩ
		V_{GS}=4.5V , I_D=0.2A	---	1.1	2.0	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	$\triangle V_{GS(th)}$		---	-4.0	---	mV/℃
Forward Transconductance	gfs	V_{DS}=10V , I_D=0.1A	---	0.40	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[2 , 3]	Q_g	V_{GS}=10V , V_{DS}=30V , I_D=0.2A	---	1.1	2.0	nC
Gate-Source Charge[2 , 3]	Q_{gs}		---	0.1	0.2	
Gate-Drain Charge[2 , 3]	Q_{gd}		---	0.23	0.5	
Turn-On Delay Time[2 , 3]	$T_{d(on)}$	V_{GS}=10V , V_{DD}=30V , R_G=6Ω , I_D=0.2A	---	3.0	6.0	ns
Rise Time[2 , 3]	T_r		---	5.0	10	
Turn-Off Delay Time[2 , 3]	$T_{d(off)}$		---	14	27	
Fall Time[2 , 3]	T_f		---	9.0	17	
Input Capacitance	C_{iss}	V_{GS}=0V , V_{DS}=10V , F=1MHz	---	30.6	45	pF
Output Capacitance	C_{oss}		---	5.5	10	
Reverse Transfer Capacitance	C_{rss}		---	4.0	8.0	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V,Force Current	---	---	0.3	A
Pulsed Source Current	I_{SM}		---	---	1.2	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=1A , T_J=25℃	---	---	1.0	V
Reverse Recovery Time[2]	t_{rr}	V_{GS}=30V , I_S=1A , dI/dt=100A/μs , T_J=25℃	---	---	---	ns
Reverse Recovery Charge[2]	Q_{rr}		---	---	---	nC

Note :

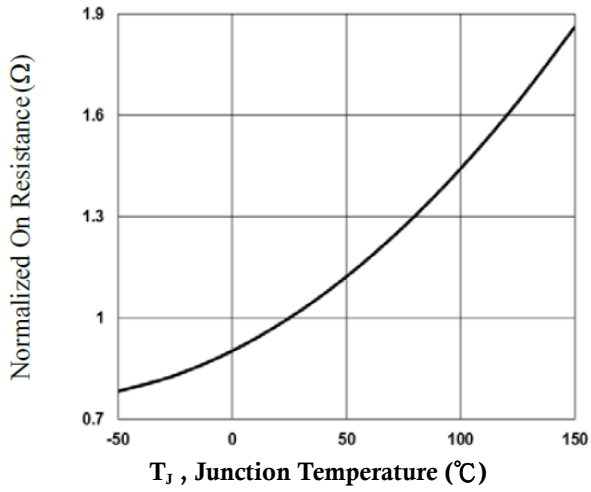
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V_{GS}=10V , V_{DD}=25V , L=1mH , I_{AS}=7A , R_G=25Ω , Starting T_J=25℃.
3. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
4. Essentially independent of operating temperature.



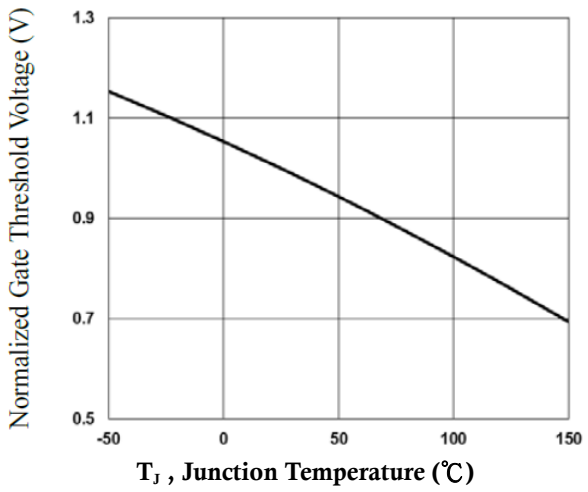
Output Characteristics



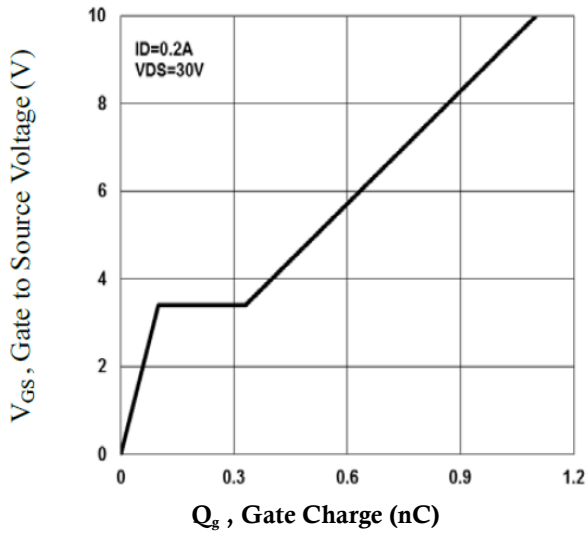
Continuous Drain Current vs. T_C



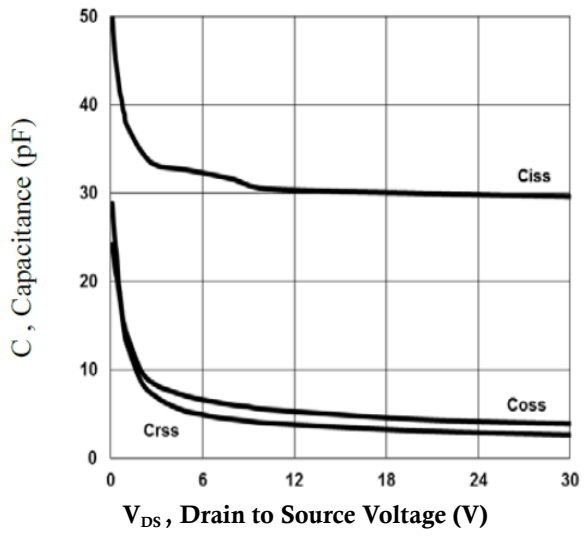
Normalized $R_{DS(ON)}$ vs. T_J



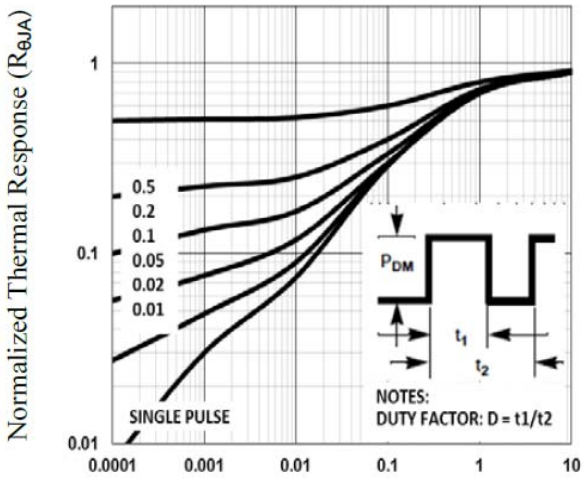
Normalized V_{th} vs. T_J



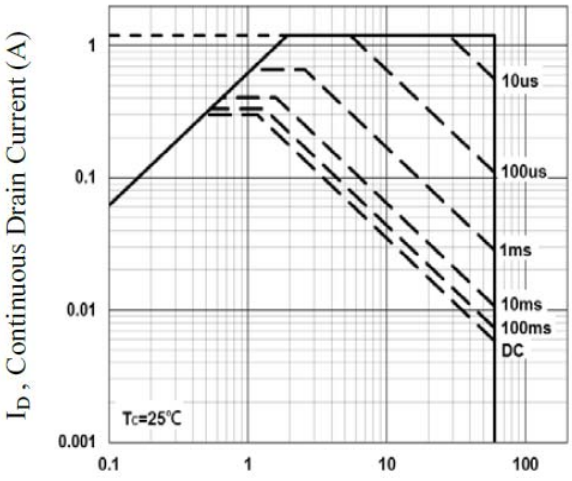
Gate Charge Waveform



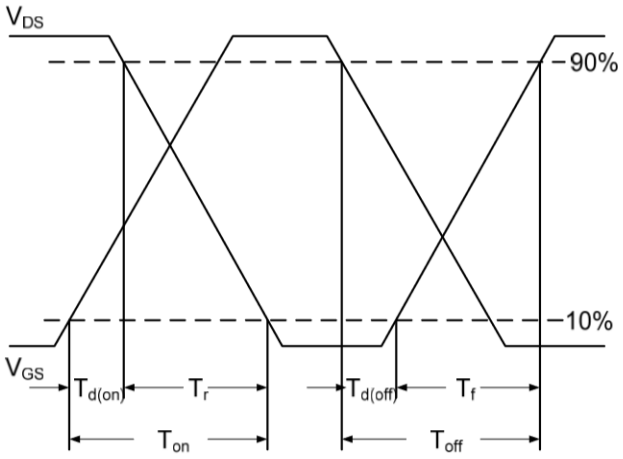
Capacitance Characteristics



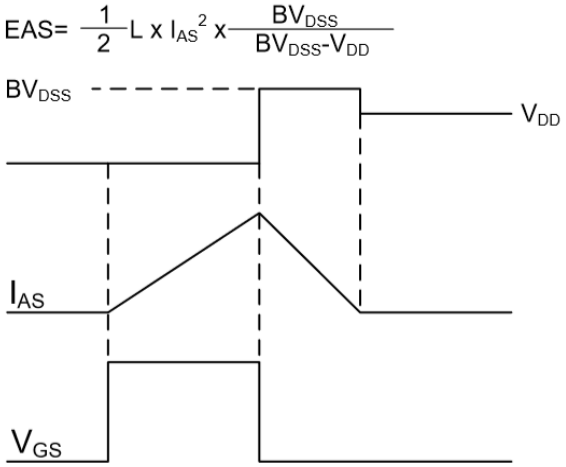
Normalized Transient Impedance



Maximum Safe Operation Area

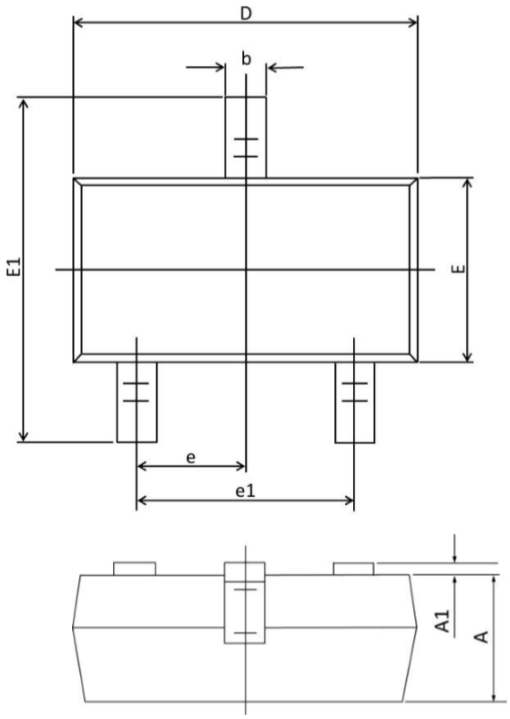


Switching Time Waveform



EAS Waveform

SOT23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.000	0.900	0.039	0.035
A1	0.100	0.000	0.004	0.000
b	0.500	0.300	0.020	0.012
c	0.110	0.090	0.004	0.003
D	3.000	2.800	0.118	0.110
E	1.400	1.200	0.055	0.047
E1	2.550	2.250	0.100	0.089
e	0.950(TYP)		0.037(TYP)	
e1	2.000	1.800	0.079	0.071
L	0.550(REF)		0.022(REF)	
L1	0.500	0.300	0.020	0.012
θ	7°	1°	7°	1°