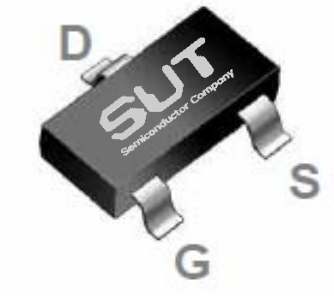
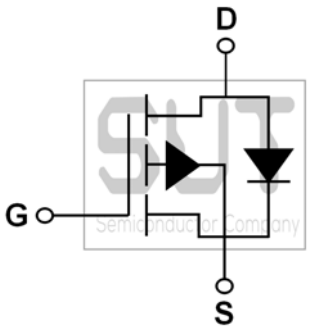
Version 1.0 Date 2019.03.27 Datasheet

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

PRODUCT SUMMARY		
B_{VDSS}(V)	$R_{DS(on)}$ (mΩ)(MAX)	I_D(A)
-60	190@V_{GS}=-10V	-2

SOT23-3S Pin Configuration





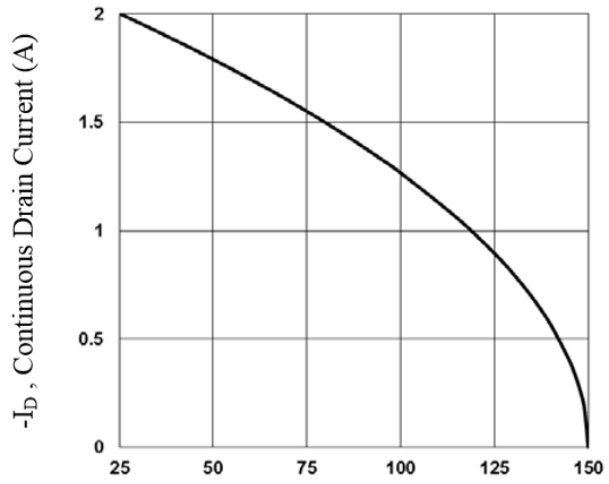
ABSOLUTE MAXIMUM RATINGS(T_C=25℃ UNLESS OTHERWISE NOTED)			
Parameter	**Symbol**	**Rating**	**Units**
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous (T_C=25℃)	I_D	-2	A
Drain Current-Continuous (T_C=100℃)		-1.25	A
Drain Current-Pulsed[1]	I_{DM}	-8	A
Power Dissipation (T_C=25℃)	P_D	1.56	W
Power Dissipation-Derate above 25℃		0.012	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	$R_{\theta JA}$	---	80	℃/W

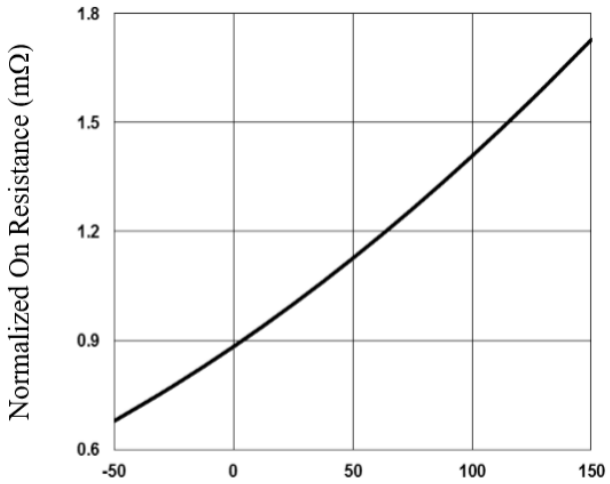
ELECTRICAL CHARACTERISTICS (T_J=25℃ UNLESS OTHERWISE NOTED)						
Parameter	**Symbol**	**Test Condition**	**Min.**	**Typ.**	**Max.**	**Unit**
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V , I_D=-250uA	-60	---	---	V
BV_{DSS} Temperature Coefficient	$\triangle BV_{DSS}/\triangle T_J$	Reference to 25℃,I_D=-1mA	---	-0.05	---	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℃	---	---	-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=-2A	---	160	190	mΩ
		V_{GS}=-4.5V , I_D=-1.5A	---	200	240	mΩ
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D=-250uA	-1.2	-1.9	-2.5	V
$V_{GS(th)}$ Temperature Coefficient	$\triangle V_{GS(th)}$		---	5.0	---	mV/℃
Forward Transconductance	gfs	V_{DS}=-10V , I_D=-2A	---	3.5	---	S
Dynamic and Switching Characteristics						
Total Gate Charge[2,3]	Q_g	V_{GS}=-10V , V_{DS}=-30V , I_D=-2A	---	8.2	12	nC
Gate-Source Charge[2,3]	Q_{gs}		---	1.8	3.6	
Gate-Drain Charge[2,3]	Q_{gd}		---	1.5	3.0	
Turn-On Delay Time[2,3]	$T_{d(on)}$	V_{GS}=-10V , V_{DD}=-30V , R_G=6Ω , I_D=-1A	---	5.2	10	ns
Rise Time[2,3]	T_r		---	19	36	
Turn-Off Delay Time[2,3]	$T_{d(off)}$		---	35	67	
Fall Time[2,3]	T_f		---	10.6	20	
Input Capacitance	C_{iss}	V_{GS}=0V , V_{DS}=-30V , F=1MHz	---	425	615	pF
Output Capacitance	C_{oss}		---	35	50	
Reverse Transfer Capacitance	C_{rss}		---	20	30	
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	V_G=V_D=0V,Force Current	---	---	-2.0	A
Pulsed Source Current	I_{SM}		---	---	-4.0	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_S=-1A ,T_J=25℃	---	---	-1.0	V

Note :

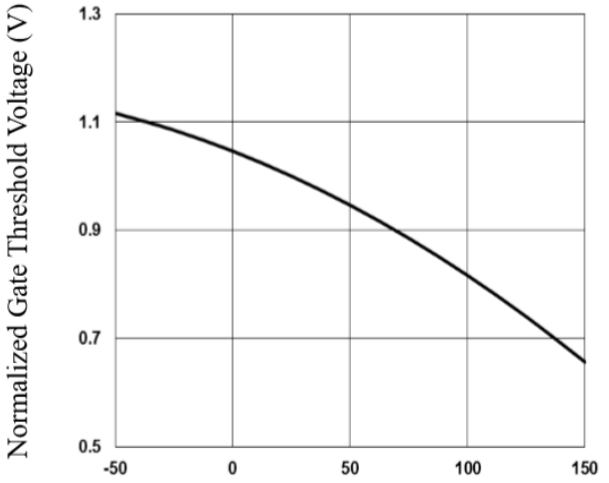
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%.
3. Essentially independent of operating temperature.



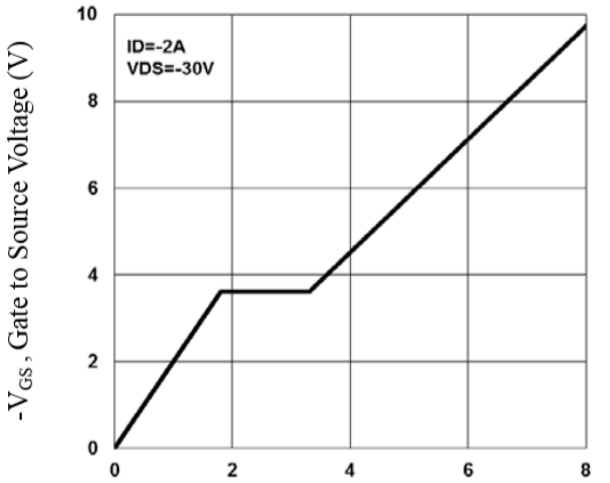
Continuous Drain Current vs. T_C



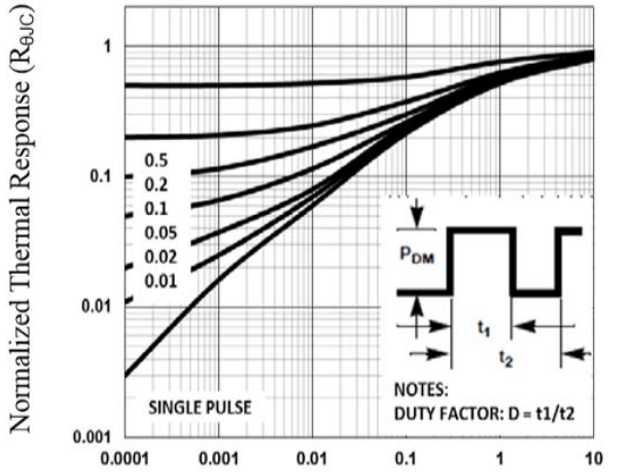
Normalized $R_{DS(ON)}$ vs. T_J



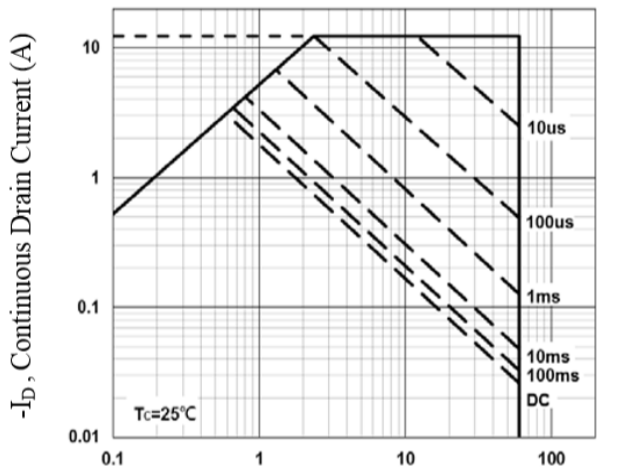
Normalized V_{th} vs. T_J



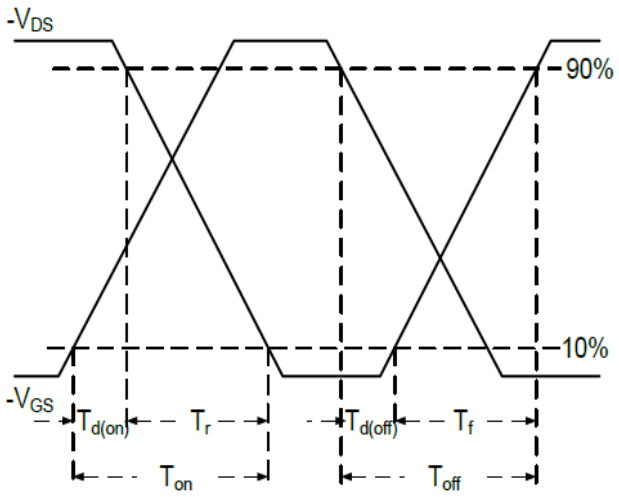
Gate Charge Waveform



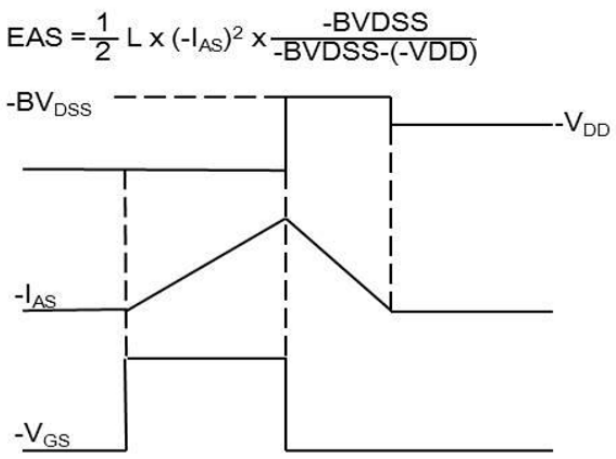
Normalized Transient Impedance



Maximum Safe Operation Area

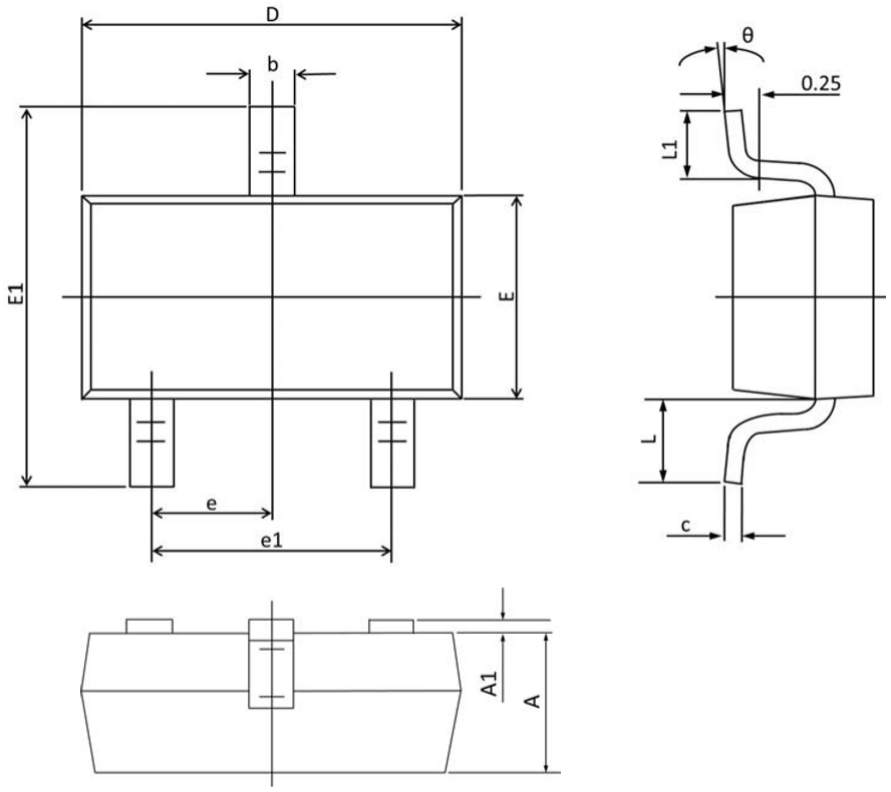


Switching Time Waveform



EAS Waveform

SOT23-3S 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°