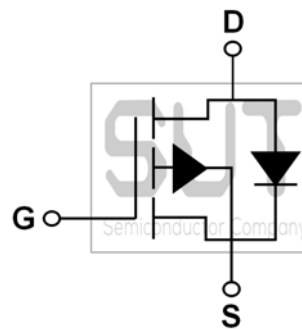
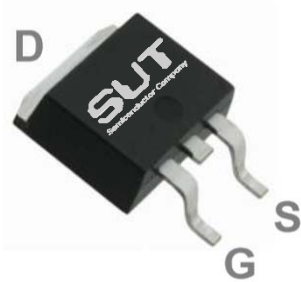


## P-Channel 60-V<sub>(D-S)</sub> MOSFET

PRODUCT SUMMARY		
B <sub>VDSS</sub> (V)	R <sub>DS(on)</sub> (mΩ)(MAX)	I <sub>D</sub> (A)
-60	48@V <sub>GS</sub> =-10V	-16

### TO252 Pin Configuration



### ABSOLUTE MAXIMUM RATINGS(T<sub>C</sub>=25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V <sub>DS</sub>	-60	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Drain Current-Continuous (T <sub>C</sub> =25°C)	I <sub>D</sub>	-16	A
Drain Current-Continuous (T <sub>C</sub> =100°C)		-10	A
Drain Current-Pulsed <sup>1</sup>	I <sub>DM</sub>	-64	A
Single Pulse Avalanche Energy <sup>2</sup>	EAS	51	mJ
Single Pulse Avalanche Current <sup>2</sup>	IAS	-32	A
Power Dissipation (T <sub>C</sub> =25°C)	P <sub>D</sub>	25	W
Power Dissipation-Derate above 25°C		0.2	W/°C
Storage Temperature Range	T <sub>STG</sub>	-50 to 150	°C
Operating Junction Temperature Range	T <sub>J</sub>	-50 to 150	°C

### THERMAL CHARACTERISTICS

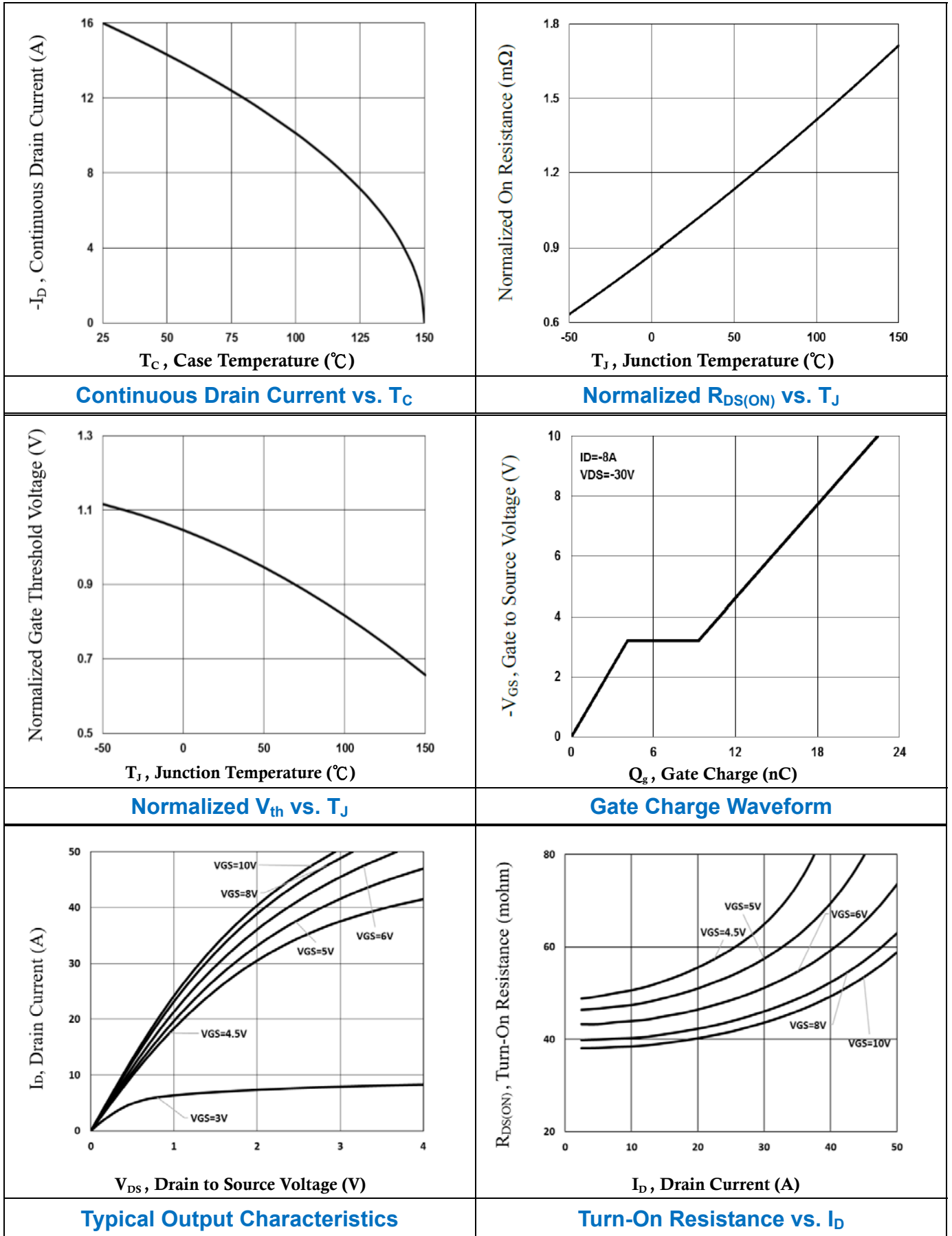
Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance Junction to ambient	R <sub>θJA</sub>	---	62	°C/W
Thermal Resistance Junction to Case	R <sub>θJC</sub>	---	5	°C/W

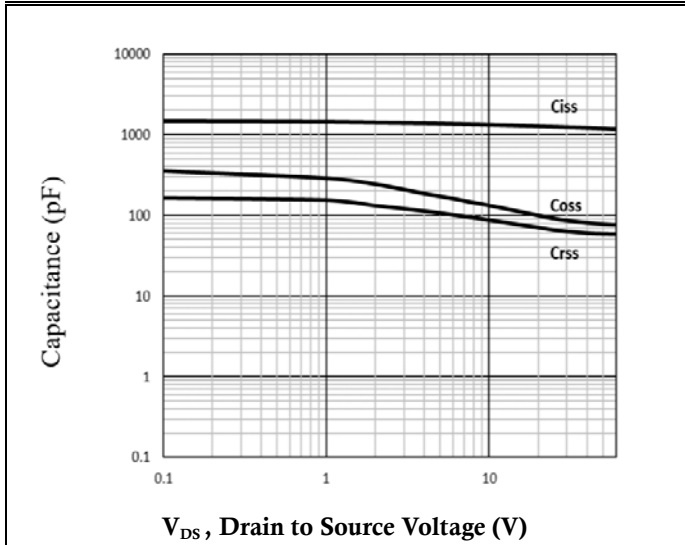
ELECTRICAL CHARACTERISTICS (T <sub>J</sub> =25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-60	---	---	V
BV <sub>DSS</sub> Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	Reference to 25°C, I <sub>D</sub> =-1mA	---	-0.05	---	V/°C
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-60V, T <sub>J</sub> =25°C	---	---	-1	uA
		V <sub>GS</sub> =0V, V <sub>DS</sub> =-48V, T <sub>J</sub> =125°C	---	---	-10	uA
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	---	---	±100	nA
<b>On Characteristics</b>						
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-8A	---	39	48	mΩ
		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4A	---	53	65	mΩ
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =-250uA	-1.2	-1.6	-2.2	V
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub>		---	5.0	---	mV/°C
Forward Transconductance	g <sub>fs</sub>	V <sub>DS</sub> =-10V, I <sub>D</sub> =-8A	---	10	---	S
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>3,4</sup>	Q <sub>g</sub>	V <sub>GS</sub> =-10V, V <sub>DS</sub> =-30V, I <sub>D</sub> =-8A	---	22.4	31	nC
Gate-Source Charge <sup>3,4</sup>	Q <sub>gs</sub>		---	4.1	6.0	
Gate-Drain Charge <sup>3,4</sup>	Q <sub>gd</sub>		---	5.2	7.0	
Turn-On Delay Time <sup>3,4</sup>	T <sub>d(on)</sub>	V <sub>GS</sub> =-10V, V <sub>DD</sub> =-30V, R <sub>G</sub> =6Ω, I <sub>D</sub> =-1A	---	13	25	ns
Rise Time <sup>3,4</sup>	T <sub>r</sub>		---	42.4	81	
Turn-Off Delay Time <sup>3,4</sup>	T <sub>d(off)</sub>		---	64.6	123	
Fall Time <sup>3,4</sup>	T <sub>f</sub>		---	16.4	31	
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =-30V, F=1MHz	---	1250	1810	pF
Output Capacitance	C <sub>oss</sub>		---	85	125	
Reverse Transfer Capacitance	C <sub>rss</sub>		---	65	95	
Gate resistance	R <sub>g</sub>	V <sub>GS</sub> =0V, V <sub>DS</sub> =0V, F=1MHz		15	30	Ω
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	I <sub>S</sub>	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	-16	A
Pulsed Source Current	I <sub>SM</sub>		---	---	-64	A
Diode Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, T <sub>J</sub> =25°C	---	---	-1.0	V
Reverse Recovery Time <sup>3</sup>	t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =-1A, dI/dt=100A/μs, T <sub>J</sub> =25°C	---	---	---	ns
Reverse Recovery Charge <sup>3</sup>	Q <sub>rr</sub>		---	---	---	nC

Note :

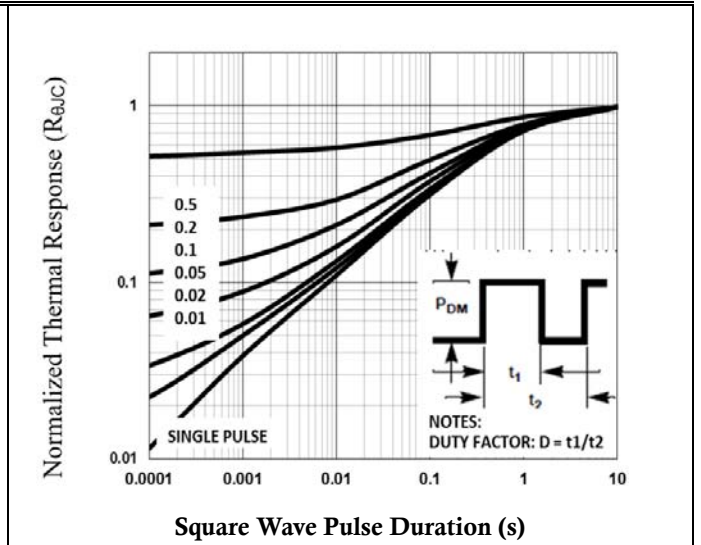
1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. V<sub>GS</sub>=-10V, V<sub>DD</sub>=-25V, L=0.1mH, I<sub>AS</sub>=-32A, R<sub>G</sub>=25Ω, Starting T<sub>J</sub>=25°C.
3. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
4. Essentially independent of operating temperature.

60V P-Channel MOSFETs

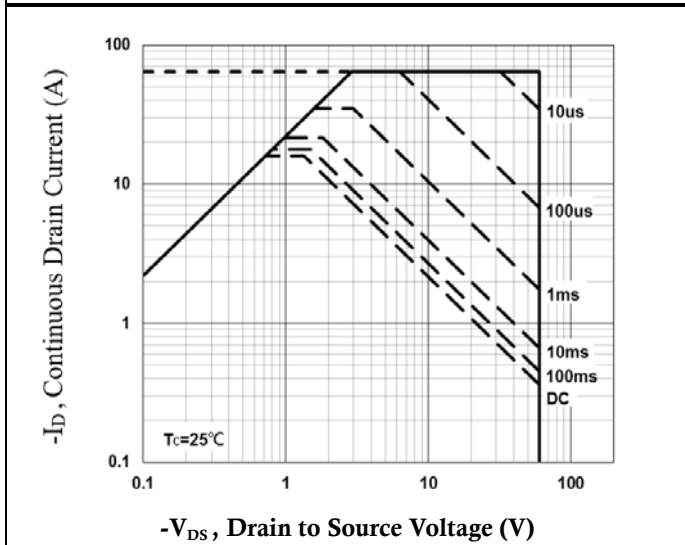




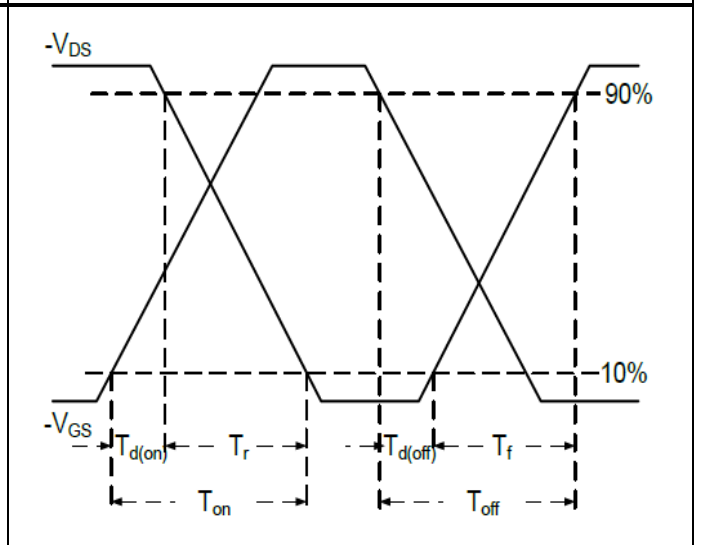
Capacitance Characteristics



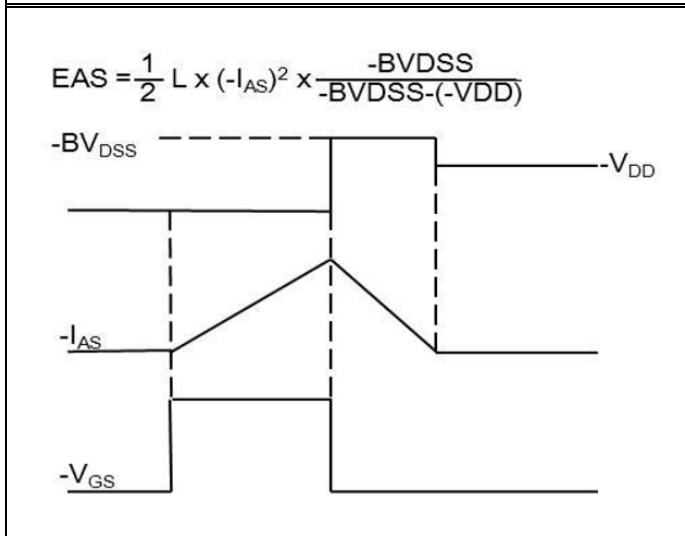
Normalized Transient Impedance



Maximum Safe Operation Area

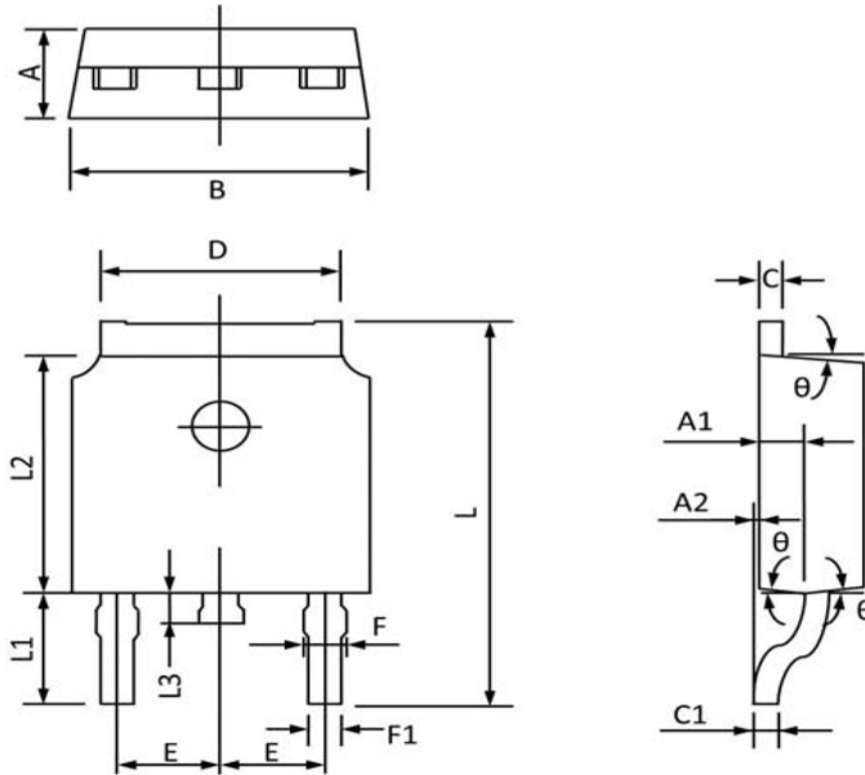


Switching Time Waveform



EAS Waveform

TO252 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	2.400	2.200	0.094	0.087
A1	1.110	0.910	0.044	0.036
A2	0.150	0.000	0.006	0.000
B	6.700	6.500	0.264	0.256
C	0.580	0.460	0.0230	0.018
C1	0.580	0.460	0.030	0.018
D	5.460	5.100	0.215	0.201
E	2.386	2.186	0.094	0.086
F	0.940	0.740	0.037	0.029
F1	0.860	0.660	0.034	0.026
L	10.400	9.800	0.409	0.386
L1	2.900(REF)		0.114(REF)	
L2	6.200	6.000	0.244	0.236
L3	1.000	0.600	0.039	0.024
θ	9°	3°	9°	3°