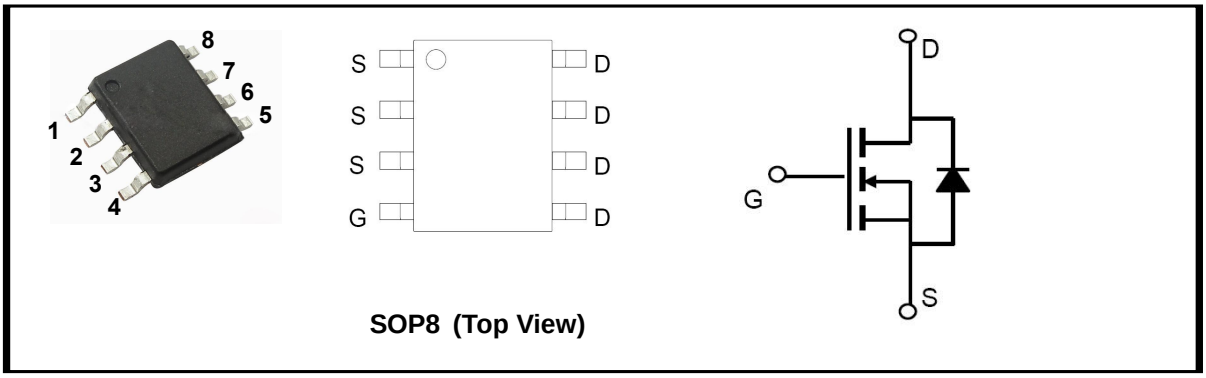
40V N-Channel Enhancement Mode MOSFET

VDS= 40V
RDS(ON), Vgs@ 10.0V, Ids@10.0A＜10.0mΩ
RDS(ON), Vgs@ 4.5V, Ids@ 8.0A ＜12.5mΩ

Features

Advanced trench process technology
High Density Cell Design For Ultra Low On-Resistance



SOP8 (Top View)

Maximum Ratings and Thermal Characteristics (TA = 25oC unless otherwise noted)

Parameter		Symbol	Rating		Unit
			10Sec	Steady State	
Drain-Source Voltage		V_{DSS}	40		V
Gate-Source Voltage		V_{GS}	±20		V
Drain Current –Continuous [A]	T_A=25℃	I_D	13.5	10	A
	T_A=70℃		10.8	8.0	A
Pulsed Drain Current [B]		I_{DM}	120		A
Avalanche Current [G]		I_{AR}	23		A
Repetitive avalanche energy L=0.3mH [G]		E_{AR}	79		mJ
Power Dissipation for Single Operation [A]	T_A=25℃	P_D	3.1	1.7	W
	T_A=70℃		2.0	1.1	
Thermal Resistance, Junction-to-Ambient [A]	t≤10S	$R_{\theta JA}$	40		℃/ W
	Steady State	$R_{\theta JA}$	75		℃/ W
Thermal Resistance, Junction-to Lead [A] (Steady State)		$R_{\theta JI}$	24		℃/ W
Operating and Junction Temperature Range		T_j T_{stg}	-55~150		℃

CHANNEL Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V V_{GS}=0V			1.0	μA
		V_{DS}=40V V_{GS}=0V T_J=55°C			5.0	μA
Gate-Body Leakage Current Forward	I_{GSS}	V_{GS}=±20V V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	1.0	1.4	2.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V I_D=10A		8.2	10	mΩ
		V_{GS}=10 V I_D=10A T_J=125°C		12.5	16	
		V_{GS}=4.5 V I_D=8.0A		10	12.5	
Diode Forward Voltage	V_{SD}	I_S=1A V_{GS}=0V		0.72	1.0	V
Forward Transconductance	g_{FS}	V_{DS}=5V I_D=5A		10		S
Input Capacitance	C_{iss}	V_{DS}=15V V_{GS}=0V f =1.0MHz		1500	1950	pF
Output Capacitance	C_{oss}			215		
Reverse Transfer Capacitance	C_{rss}			135		
Total Gate Charge(10V)	Q_g	V_{DS}=20V I_D=10A V_{GS}=10V		27.2	37	nC
Total Gate Charge(4.5V)				13.6	18	
Gate-Source Charge	Q_{gs}			4.5		
Gate-Drain Charge	Q_{gd}			6.4		
Gate resistance	R_g	V_{GS}=0V V_{DS}=0V f=1MHz	2.0	3.5	5.0	Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DS}=20V R_L=2Ω V_{GS}=10V R_{GEN}=3Ω		6.4		ns
Turn-On Rise Time	t_r			17.2		
Turn-Off Delay Time	$t_{d(off)}$			29.6		
Turn-Off Fall Time	t_f			16.8		
Continuous Drain-Source Diode Forward Current	I_S				2.5	A
Body Diode Reverse Recovery Time	t_{rr}	I_F=10A dI/dt=100A/μs		30	40	ns
Body Diode Reverse Recovery Charge	Q_{rr}			19		nC

Notes:

A:The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A= 25°C. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to lead $R_{\theta JL}$ and lead to ambient.

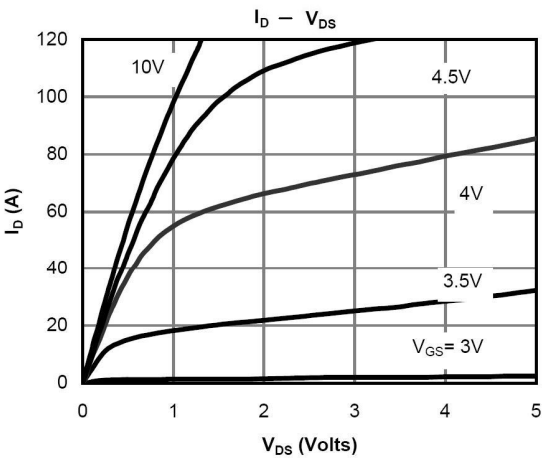
D. The static characteristics in Figures 1 to 6 are obtained using t ≤ 300μs pulses, duty cycle 0.5% max.

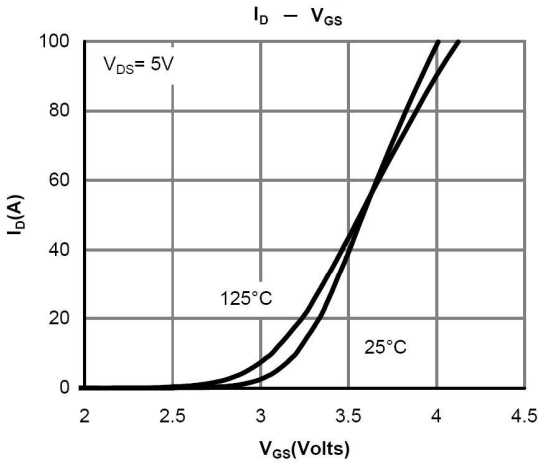
E. These tests are performed with the device mounted on 1 in2 FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

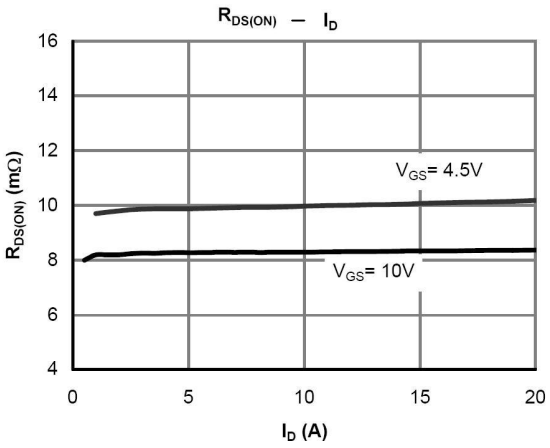
F. The current rating is based on the t ≤ 10s thermal resistance rating.

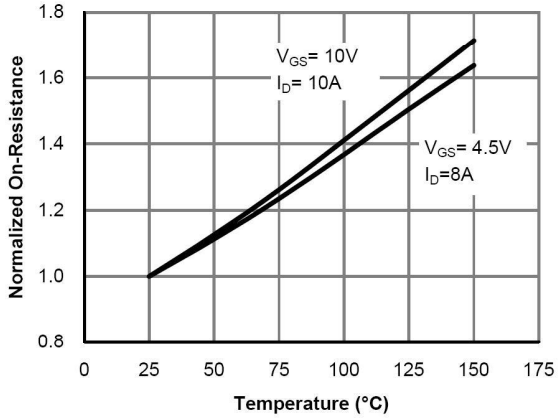
G. E_{AR} and I_{AR} ratings are based on low frequency and duty cycles to keep T_j=25℃.

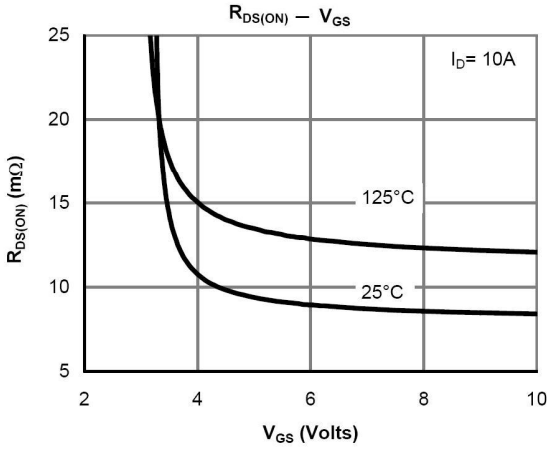
N-CHANNEL Electrical Characteristic Curve

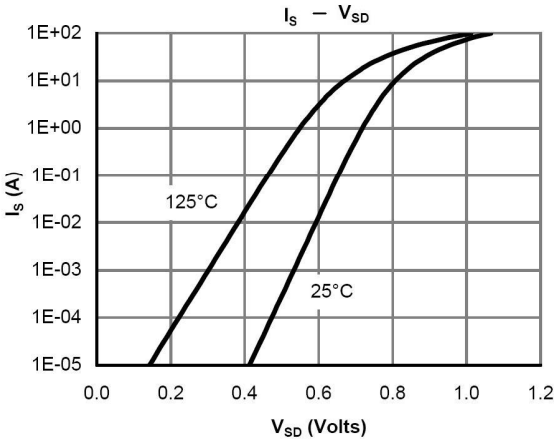




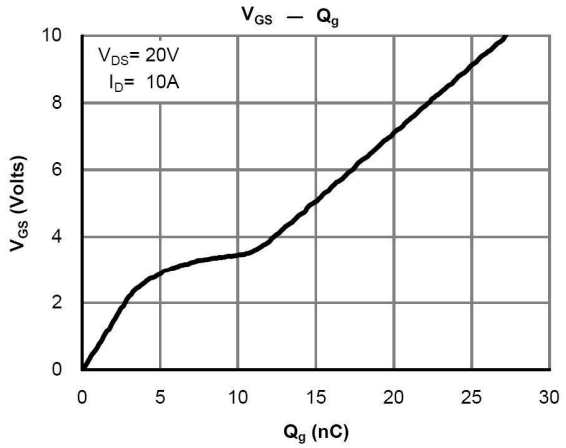


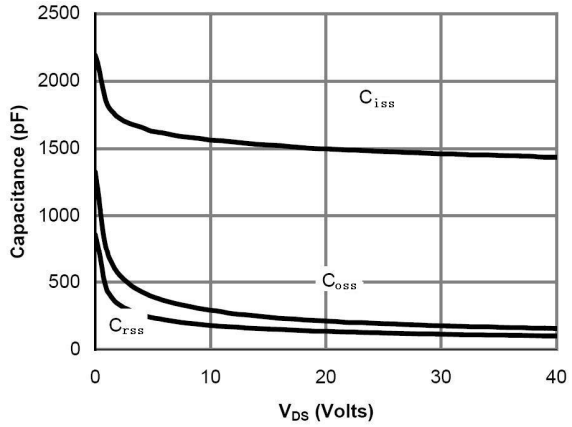


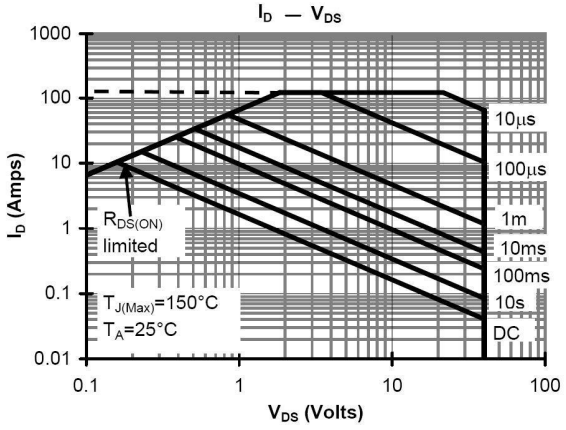


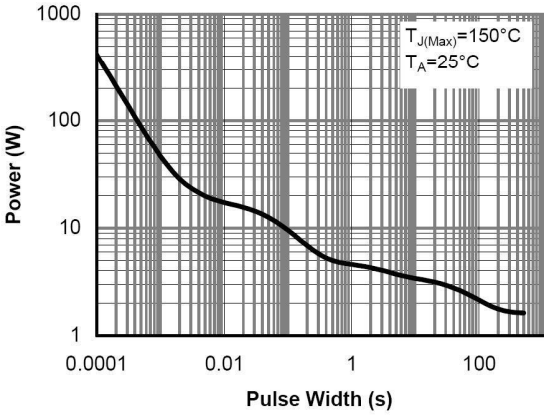


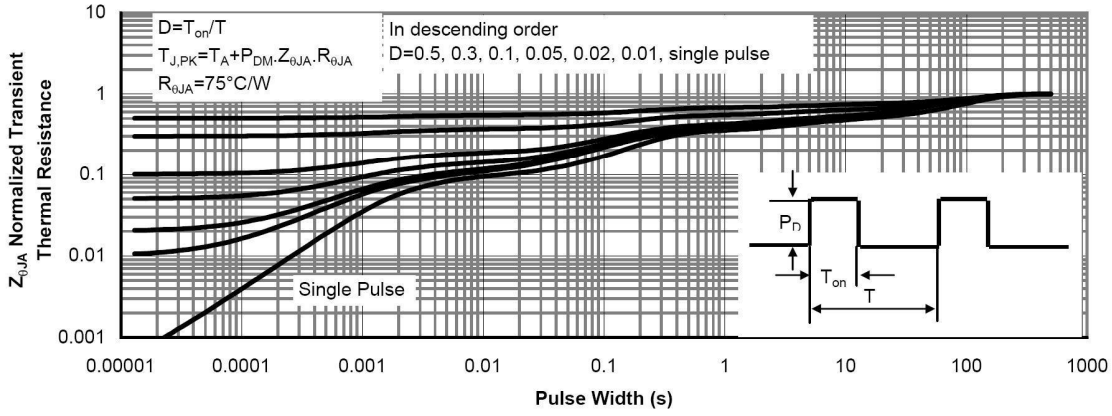
N-CHANNEL Electrical Characteristic Curve





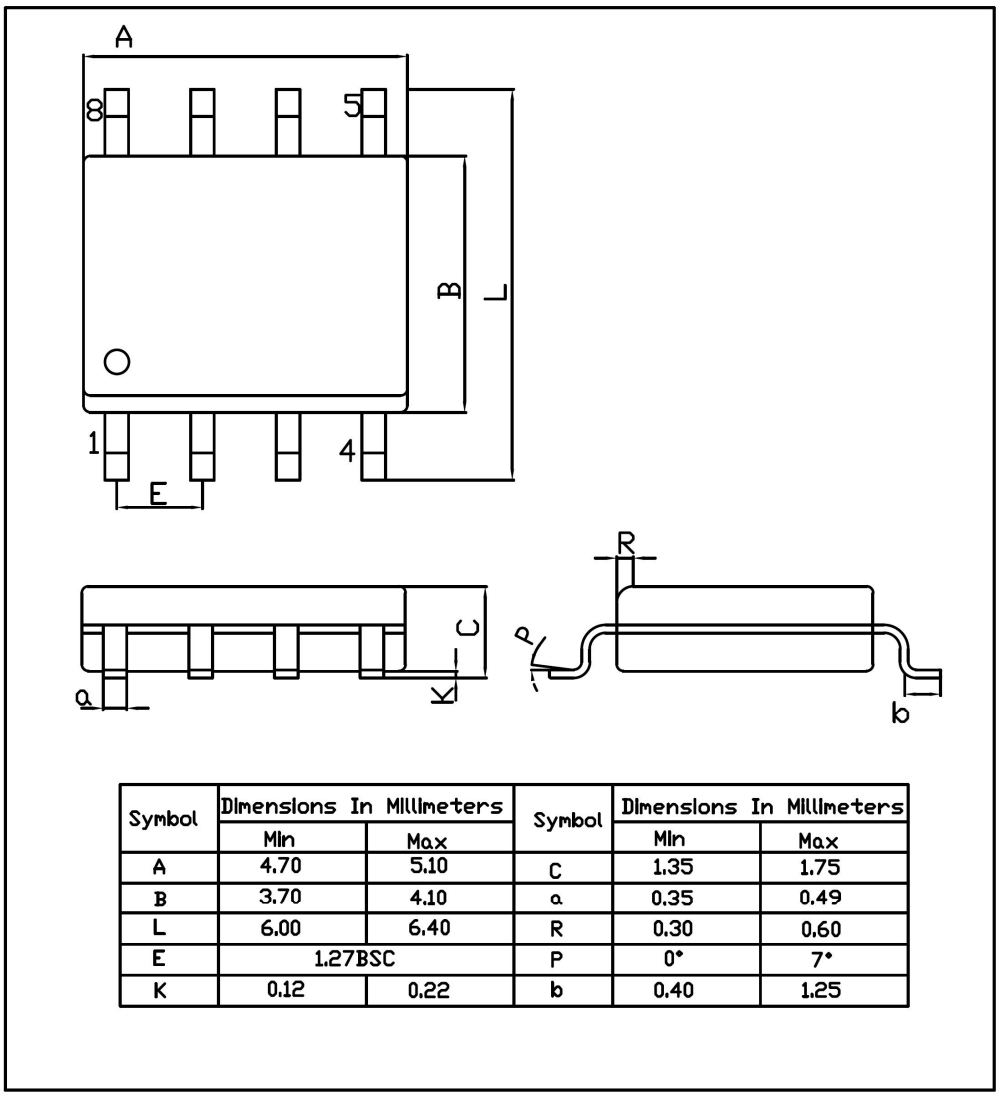






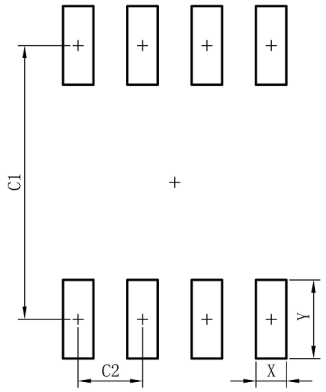
Dimension outline Unit:mm

SOP-8 Unit:mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.70	5.10	C	1.35	1.75
B	3.70	4.10	α	0.35	0.49
L	6.00	6.40	R	0.30	0.60
E	1.27BSC		P	0°	7°
K	0.12	0.22	b	0.40	1.25

Suggested Pad Layout UNIT: mm



SOP-8	
DIM	(mm)
X	0.60
Y	1.55
C1	5.40
C2	1.27