STC4614

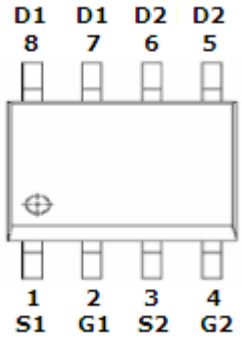
N&P Pair Enhancement Mode MOSFET

10.0A / -10.0A

DESCRIPTION

The STC4614 is the N & P-Channel enhancement mode power field effect transistor using high cell density DMOS trench technology. This high density process is especially tailored to minimize on-state resistance and provide superior switching performance. This device is particularly suited for low voltage application such as notebook computer power management and other battery powered circuits, where high-side switching, low in-line power loss and resistance to transient are needed.

PIN CONFIGURATION
SOP-8



PART MARKING

Y：Year
A：Product code
B：wafer Code

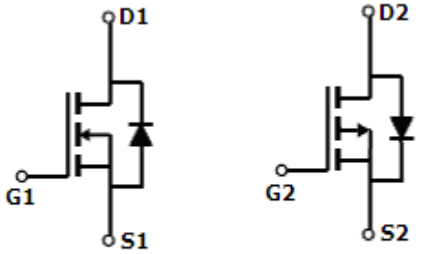
FEATURE

N-Channel

- 40V/10.0A, $R_{DS(ON)}$ = 25mR(Typ.) @V_{GS} = 10V
- 40V/6.0A, $R_{DS(ON)}$ = 32mΩ @V_{GS} = 4.5V

P-Channel

- -40V/-10.0A, $R_{DS(ON)}$ = 37mΩ(Typ.) @V_{GS} = -10V
- -40V/-5.0A, $R_{DS(ON)}$= 43mΩ @V_{GS} = - 4.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOP-8 package



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ABSOULTE MAXIMUM RATINGS (Ta = 25℃ Unless otherwise noted)

Parameter		Symbol	Typical N	Typical P	Unit
Drain-Source Voltage		V_{DSS}	40	-40	V
Gate-Source Voltage		V_{GSS}	±20	±20	V
Continuous Drain Current (TJ=150℃)	T_A=25℃ T_A=70℃	I_D	10.0 7.0	-10.0 -6.0	A
Pulsed Drain Current		I_{DM}	20	-20	A
Continuous Source Current (Diode Conduction)		I_S	2.5	-2.5	A
Power Dissipation	T_A=25℃ T_A=70℃	P_D	2.5 1.8	2.5 1.8	W
Operation Junction Temperature		T_J	150		℃
Storgae Temperature Range		T_{STG}	-55/150		℃
Thermal Resistance-Junction to Ambient	T□10Sec Sready State	$R_{\theta JA}$	62.5 110	62.5 110	℃/W

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ELECTRICAL CHARACTERISTICS (Ta = 25℃ Unless otherwise noted)

Parameter	Symbol	Condition		Min	Typ	Max	Unit
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=10mA V_{GS}=0V,I_D=-10mA	N P	40 -40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=VGS,I_D=250 uA V_{DS}=VGS,I_D=-250uA	N P	1.0 -1.0		3.0 -3.0	V
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V V_{DS}=0V,V_{GS}=±20V	N P			±100 ±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V,V_{GS}=0V V_{DS}=-32V,V_{GS}=0V	N P			1 -1	uA
	T_J=55℃	V_{DS}=32V,V_{GS}=0V V_{DS}=-32V,V_{GS}=0V	N P			5 -5	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=10V V_{DS}≧-5V,V_{GS}=-10V	N P	20 -20			A
Drain-source On-Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=10.0A V_{GS}=-10V,I_D=-10.0A	N P		0.025 0.035	0.030 0.043	Ω
		V_{GS}=4.5V, I_D=6.0A V_{GS}=-4.5V,I_D=-5.0 A	N P		0.030 0.043	0.037 0.052	
Forward Tran Conductance	gfs	V_{DS}=5V,I_D=6.9A V_{DS}=-15V,I_D=-5.9A	N P		22 13		S
Diode Forward Voltage	V_{SD}	I_S=1.0A,V_{GS}=0V I_S=-1.7A,V_{GS}=0V	N P			1.2 -1.2	V
Dynamic							
Total Gate Charge	Q_g	**N-Channel** V_{DS}=20V,V_{GS}=10V I_D≡6.0A **P-Channel** V_{DS}=-20V,V_{GS}=-10V I_D≡-5.0A	N P		8.3 13.6	10.0 15.0	nC
Gate-Source Charge	Q_{gs}		N P		1.3 1.8	2.0 2.5	
Gate-Drain Charge	Q_{gd}		N P		2.3 4.0	3.0 5.0	
Turn-On Time	$t_{d(on)}$ tr	**N-Channel** V_{DS}=20V,R_L=3.3Ω I_D=1A,R_{GEN}=3Ω **P-Channel** V_{DS}=-20V,R_L=4.0Ω I_D=-1A,R_{GEN}=-3Ω	N P		4.6 7.7	6.0 11.5	nS
			N P		3.1 6.7	4 9	
Turn-Off Time	$t_{d(off)}$ tf		N P		15.6 26.2	21 34	
			N P		3.0 11.2	4.0 15	

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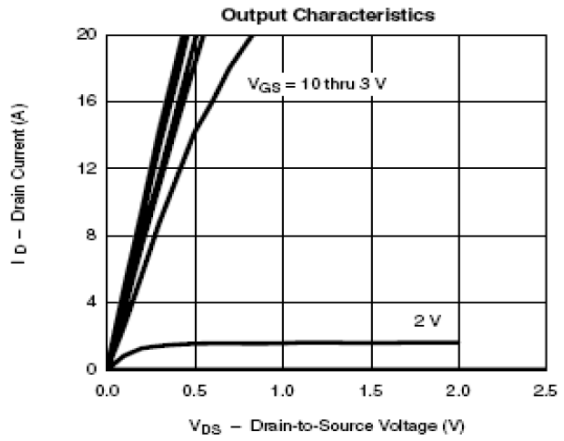
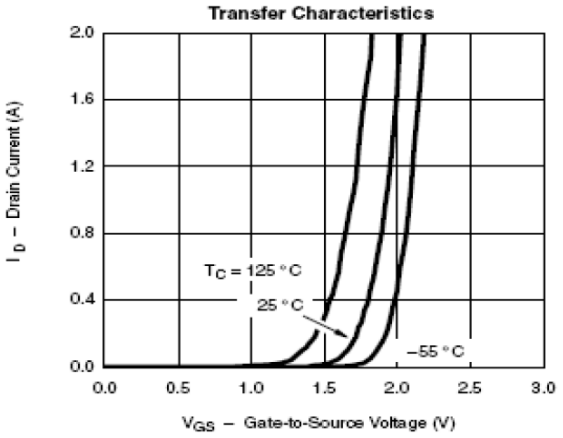
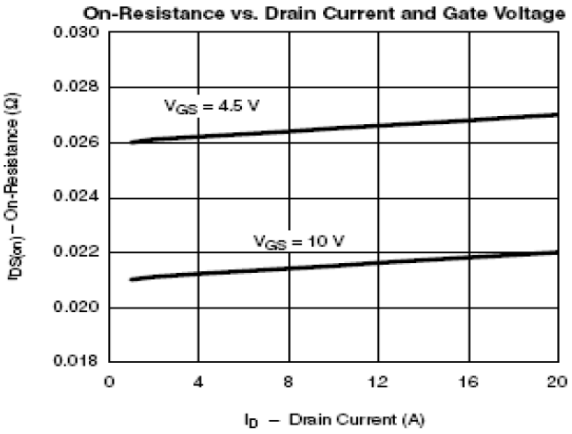
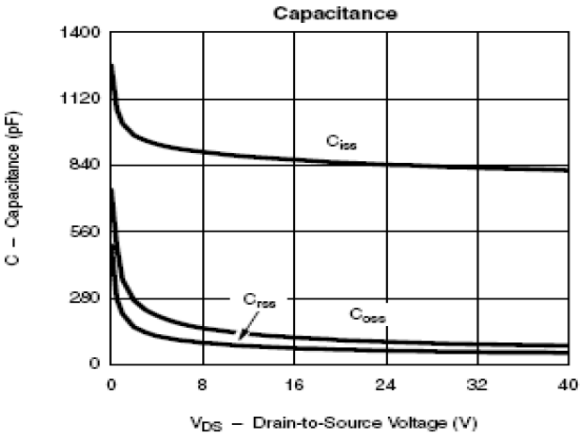
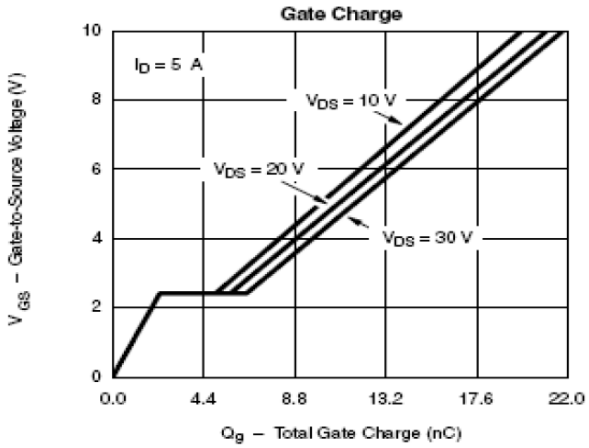
TYPICAL CHARACTERICTICS (N MOS)

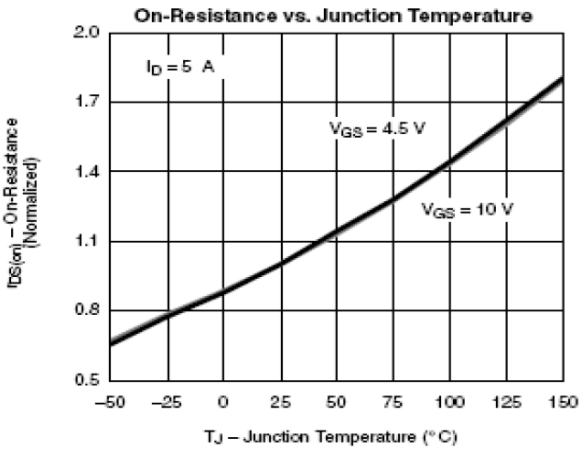












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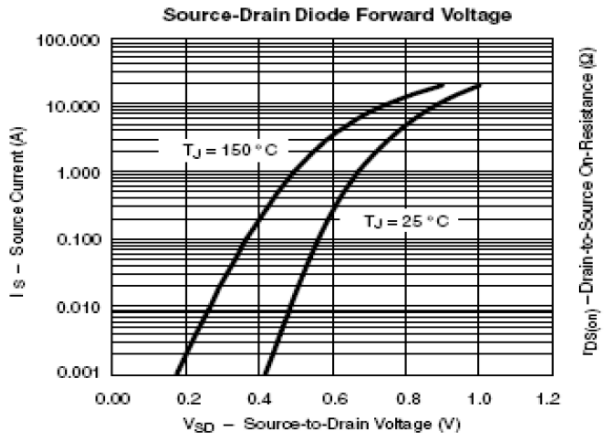

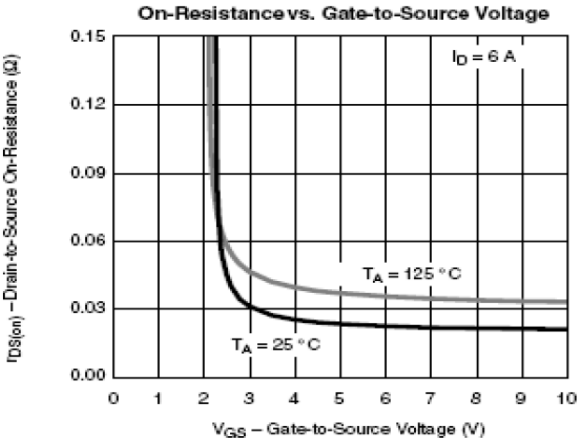

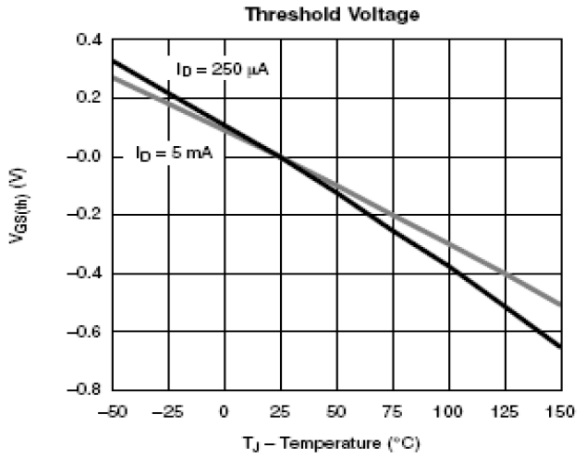

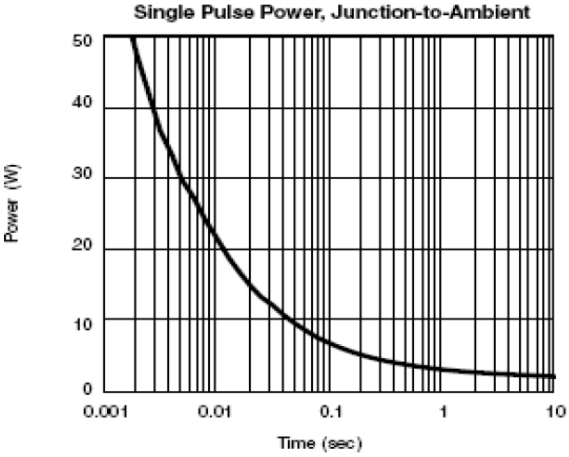

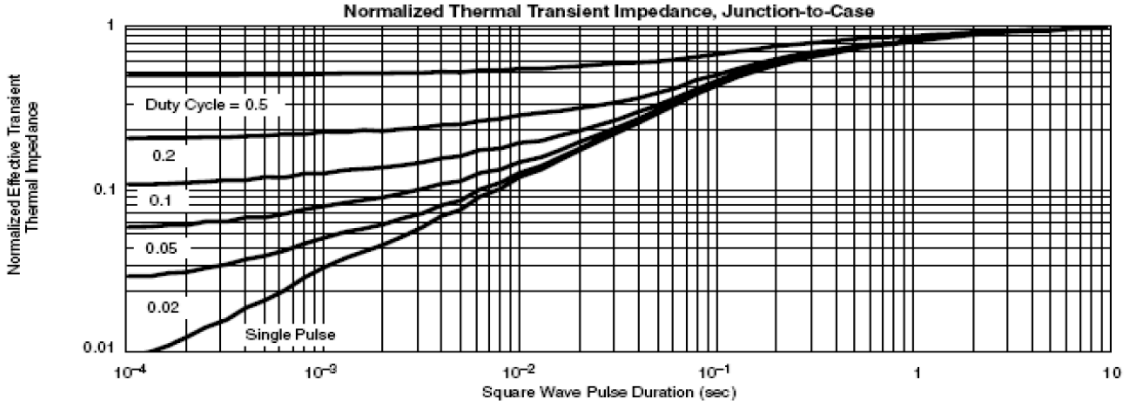

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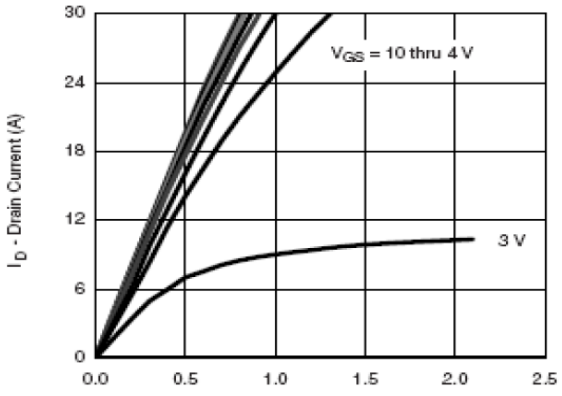
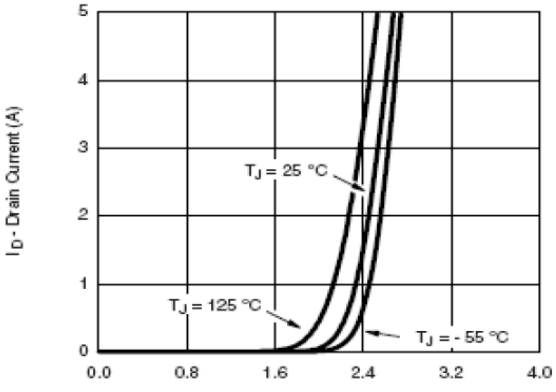
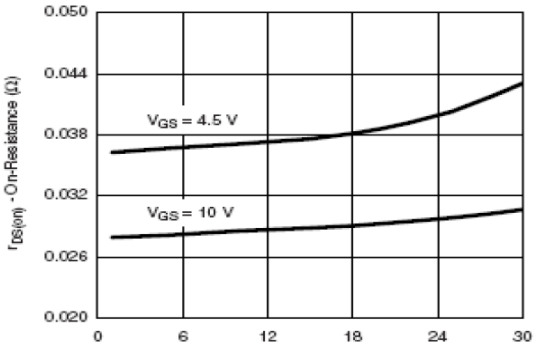
YPICAL CHARACTERICTICS (P MOS)



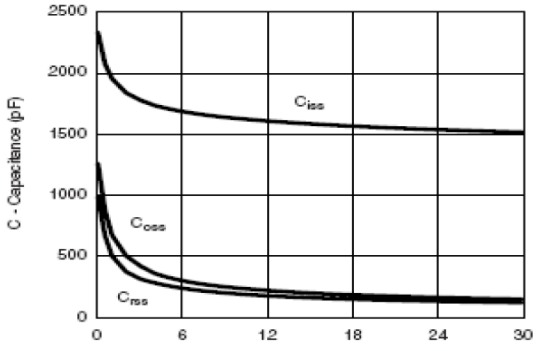
Output Characteristics



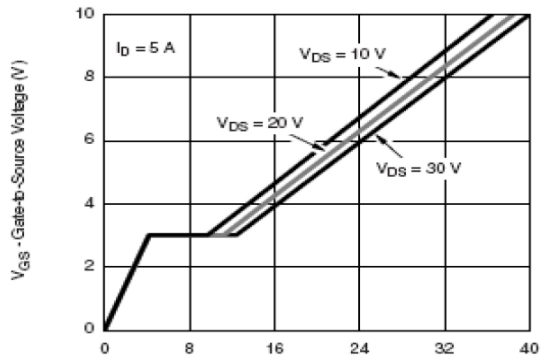
Transfer Characteristics



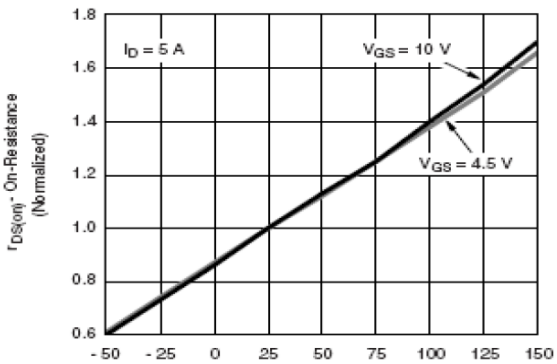
On-Resistance vs. Drain Current



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

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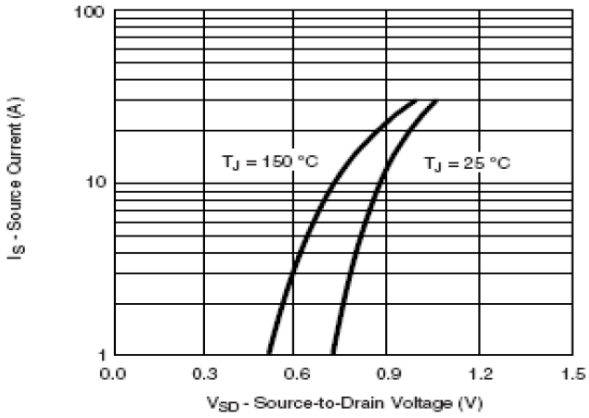
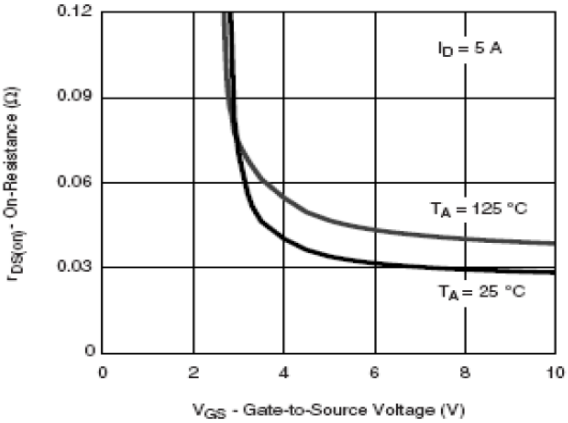
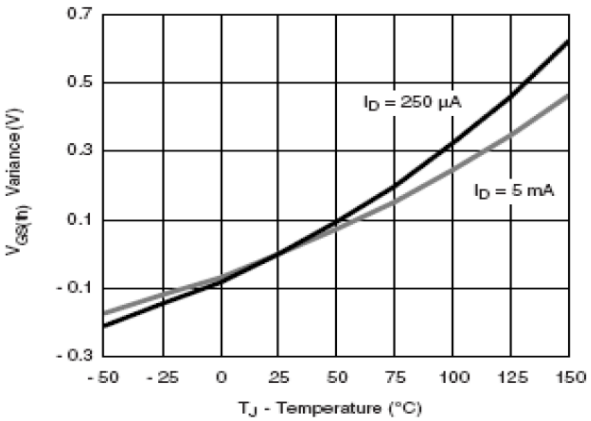


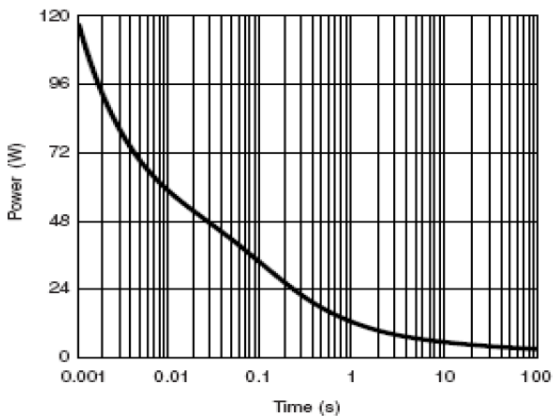
Source-Drain Diode Forward Voltage



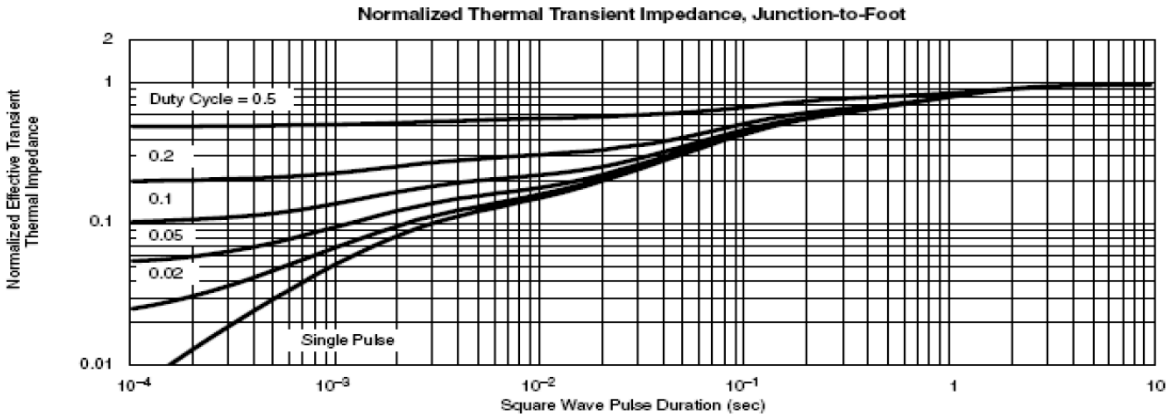
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power, Junction-to-Ambient



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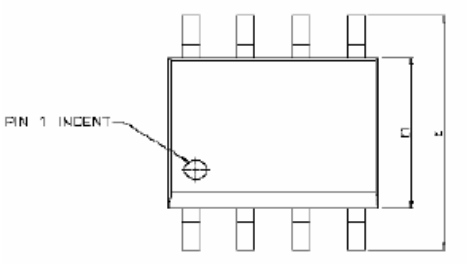
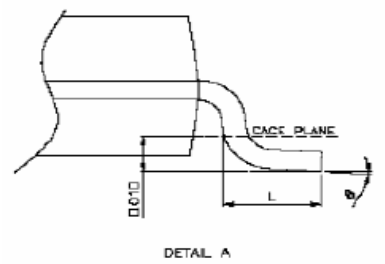
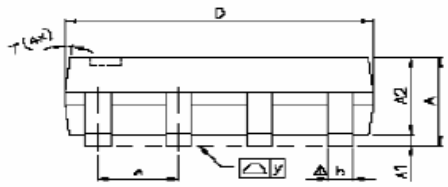
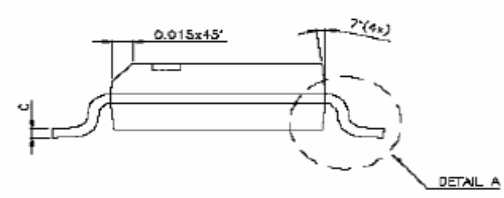
SOP-8 PACKAGE OUTLINE









SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	——	0.25	0.004	——	0.010
A2	——	1.45	——	——	0.057	——
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	——	1.27	——	——	0.050	——
L	0.38	0.71	1.27	0.015	0.028	0.050
② y	——	——	0.076	——	——	0.003
θ	0°	——	8°	0°	——	8°

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