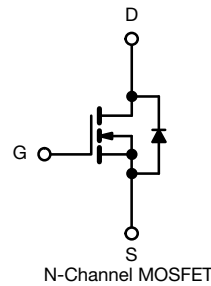
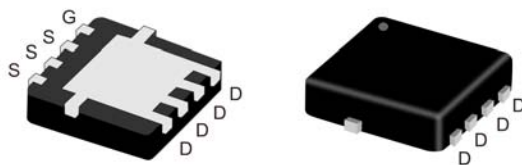


N-Channel 30V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
30	0.0079 at V _{GS} = 10 V	30
	0.010 at V _{GS} = 4.5 V	30

Pin Configuration

Power5x6



Features

- Very Low R_{DS(on)} at 4.5V V_{gs}
- Low Gate Charge
- High Current Capability
- 100% R_g and UIS Tested
- RoHS and Halogen-Free Compliant

Applications

- Synchronous Rectification
- Networking DC-DC Power System
- Power Tool Application

Absolute Maximum Ratings

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current	I _D	T _C =25°C	A
		T _C = 70 °C	
Pulsed Drain Current	I _{DM}	70	
Continuous Drain Current	I _{DSM}	T _A =25°C	A
		T _A =70°C	
Avalanche Current	I _{AS} , I _{AR}	31	A
Avalanche energy L=0.1mH ^c	E _{AS} , E _{AR}	48	mJ
Power Dissipation	P _D	T _C =25°C	W
		T _C = 70 °C	
Power Dissipation	P _{MDS}	T _A =25°C	W
		T _A =70°C	
Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

Thermal Data

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient	R _{θJA}	21	26	°C/W
Maximum Junction-to-Case	R _{θJC}	2.4	3.0	°C/W

Electrical Characteristics (T_J = 25 °C Unless Otherwise Specified)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
STATIC PARAMETERS						
B _V DSS	Drain-Source Breakdown Voltage	I _D =250μA, V _{GS} =0V	30			V
I _D DSS	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V T _J =55°C			1 5	μA
I _G SS	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±20V			± 100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1		3	V
I _{D(ON)}	On state drain current	V _{GS} =10V, V _{DS} =5V	50			A
R _{DS(ON)}	Static Drain-Source On-Resistance	V _{GS} =10V, I _D =20A		6.5	7.9	mΩ
		V _{GS} =4.5V, I _D =14A		8.2	10	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 15V, I _D =20A		70		S
V _{SD}	Diode Forward Voltage	I _S = 4A, V _{GS} =0V		0.8	1.2	V
I _S	Maximum Body-Diode Continuous Current ^G	T _C = 25 °C			30	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		1155		pF
C _{oss}	Output Capacitance			260		pF
C _{rss}	Reverse Transfer Capacitance			95		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	0.2	1.0	2.0	Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{DS} = 15 V, V _{GS} = 10V, I _D =20A		20	30	nC
Q _g (4.5V)	Total Gate Charge	V _{DS} =15V V _{GS} = 4.5 V, I _D =20A,		8.8	14	nC
Q _{gs}	Gate Source Charge			3.5		nC
Q _{gd}	Gate Drain Charge			2.2		nC
t _{D(on)}	Turn-On DelayTime		V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 4.5 V, R _g = 17 Ω		20	30
t _r	Turn-On Rise Time			15	25	ns
t _{D(off)}	Turn-Off DelayTime			25	40	ns
t _f	Turn-Off Fall Time			10	15	ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =4.0A, dI/dt=100A/μs, T _J =25 °C			21	42
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =4.0A, dI/dt=100A/μs, T _J =25 °C		15	30	nC

A. The value of R_{θJA} 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 Power dissipation P_{DSM} is based on R_{θJA} and the maximum allowed junction temperature of 150 ° C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150 ° C may be used if the PCB allows it.

B. The power dissipation P_D is based on T_{J(MAX)}=150 ° C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150 ° C. Ratings are based on low frequency and duty cycles to keep initial T_J=25 ° C.

D. The R_{θJA} is the sum of the thermal impedance from junction to case R_{θJC} and case to ambient.

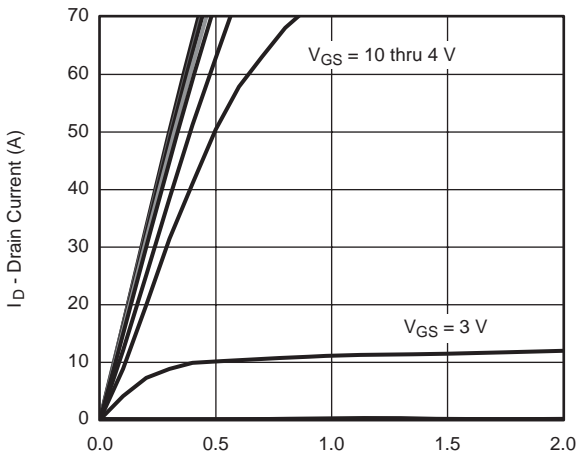
E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of T_{J(MAX)}=150 ° C. The SOA curve provides a single pulse rating.

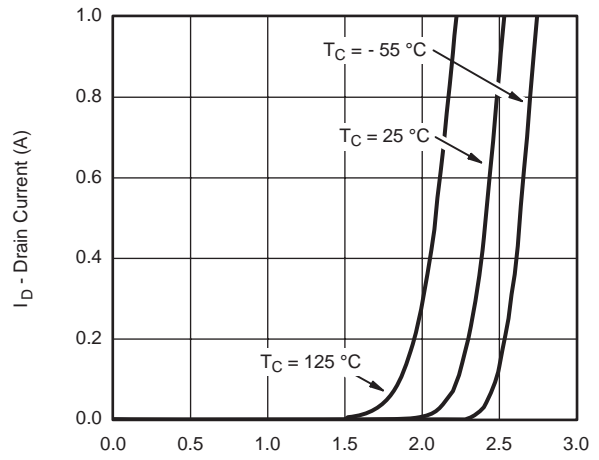
G. The maximum current rating is package limited.

H. 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.

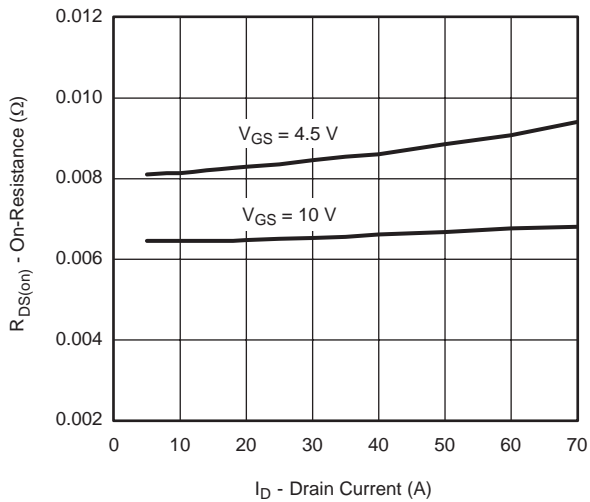
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



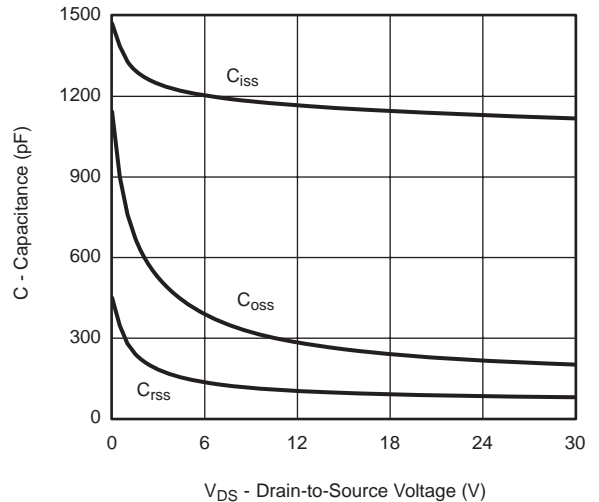
Output Characteristics



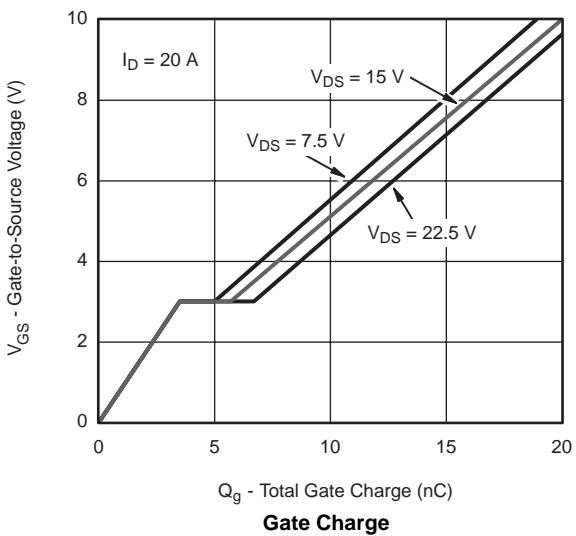
Transfer Characteristics



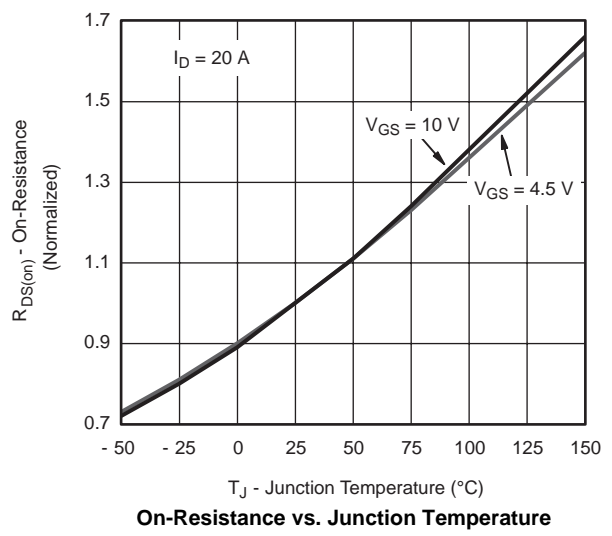
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

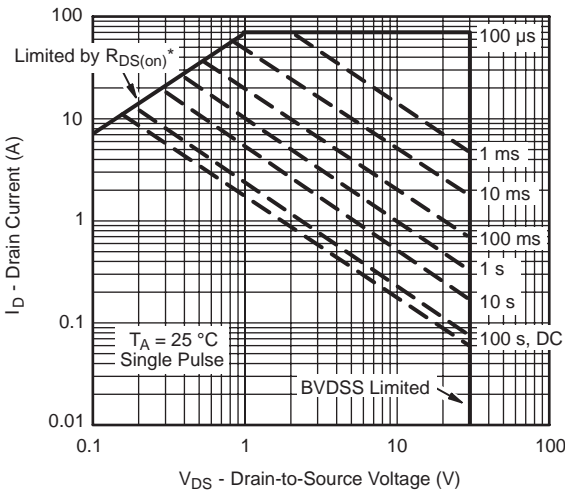
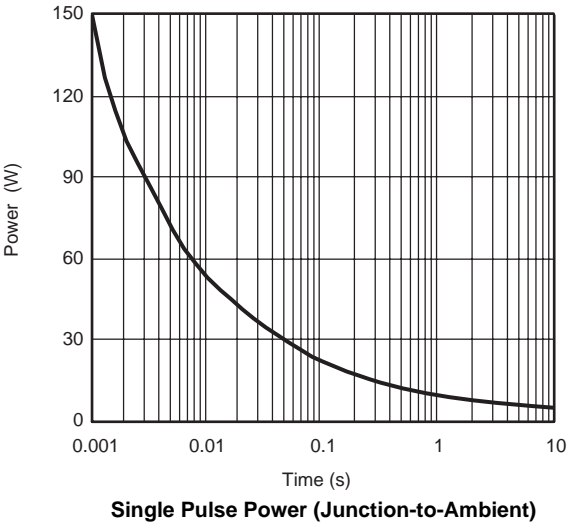
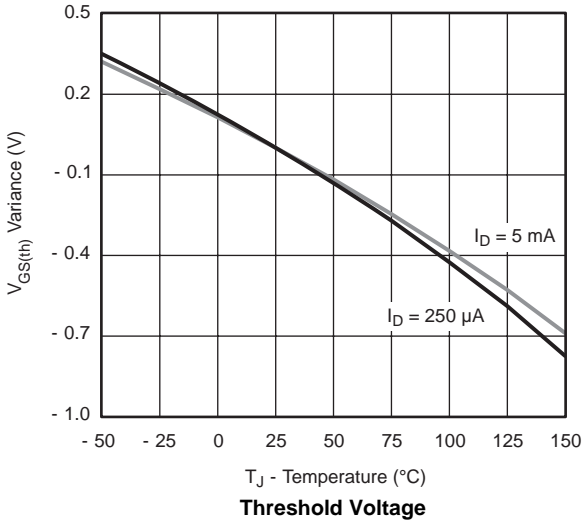
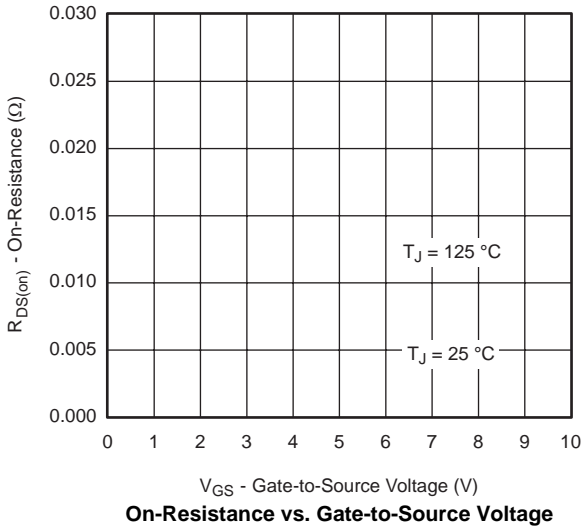
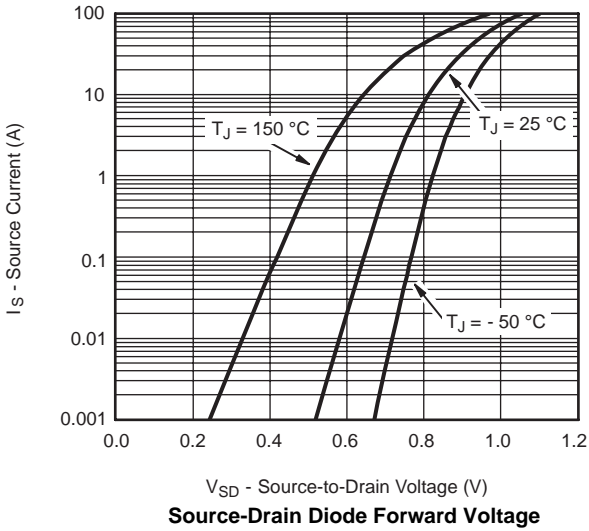


Gate Charge



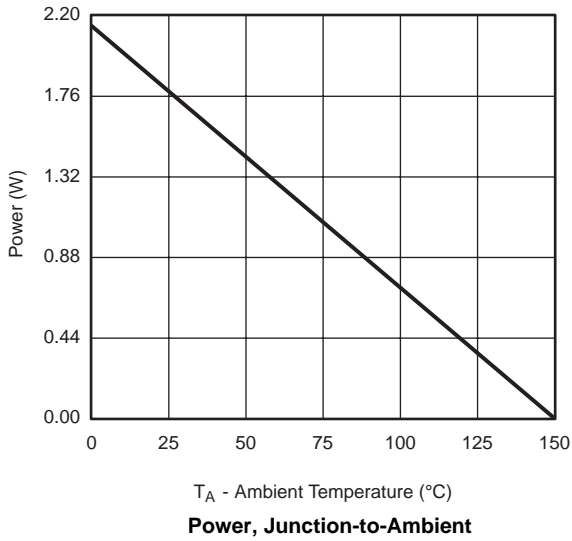
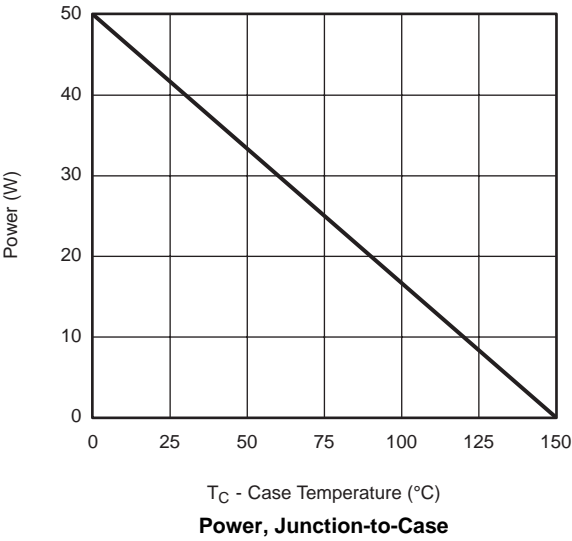
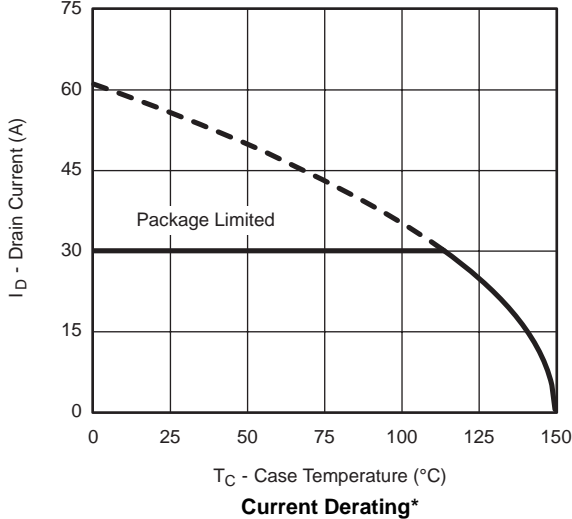
On-Resistance vs. Junction Temperature

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

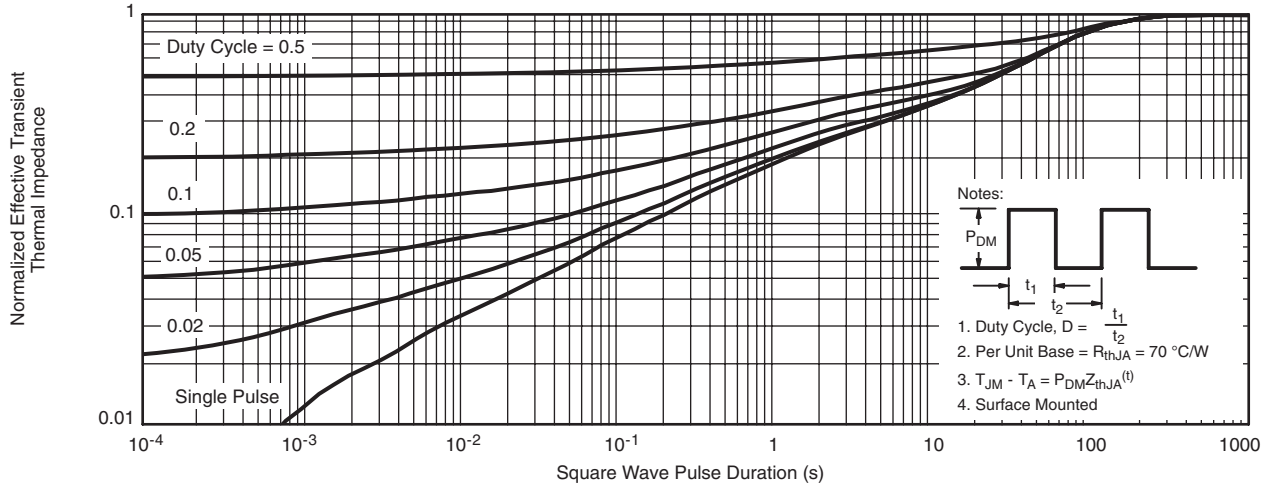


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified
Safe Operating Area, Junction-to-Ambient

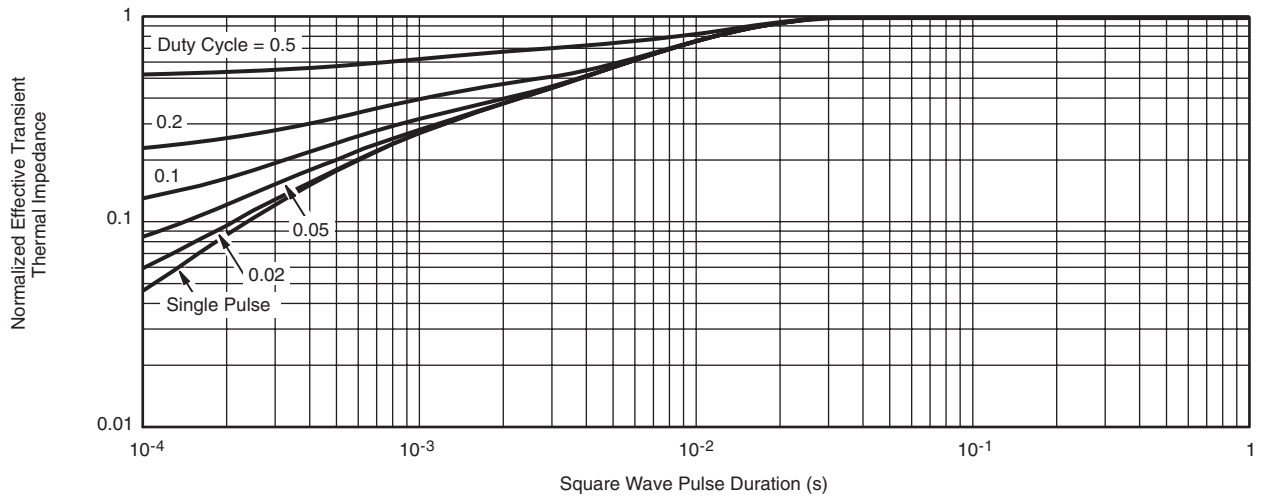
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

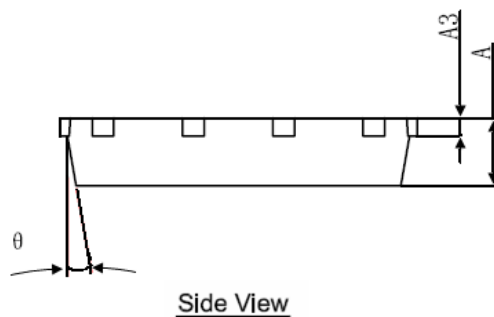
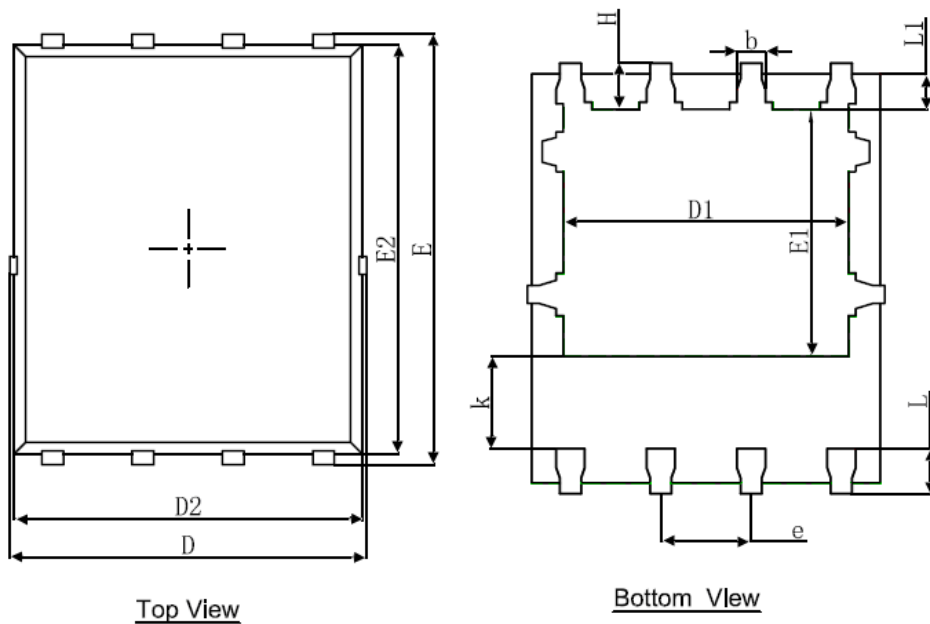


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

Power5x6 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	8°	12°	8°	12°