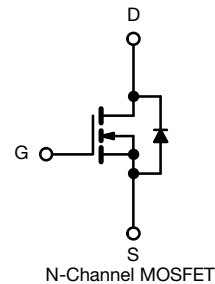
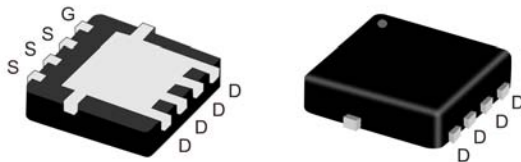


N-Channel 30V (D-S) MOSFET

Product Summary		
V _{DS} (V)	R _{DS(on)} (mΩ) (Max.)	I _D (A)
30	1.0 at V _{GS} = 10 V	100
	1.35 at V _{GS} = 4.5 V	100

Pin Configuration

Power5x6



Features

- Very Low RDS(on) at 4.5V Vgs
- Low Gate Charge
- High Current Capability
- 100% Rg and UIS Tested
- RoHS and Halogen-Free Compliant

Applications

- Synchronous Rectification
- High Power Density DCDC
- VRMs and Embedded DCDC
- ORing

Absolute Maximum Ratings

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^G	I _D	T _C =25°C	A
		T _C =100°C	
Pulsed Drain Current ^C	I _{DM}	400	
Continuous Drain Current	I _{DSM}	T _A =25°C	A
		T _A =70°C	47
Avalanche Current ^C	I _{AS} , I _{AR}	50	A
Avalanche energy L=0.1mH ^C	E _{AS} , E _{AR}	125	mJ
Power Dissipation ^B	P _D	T _C =25°C	W
		T _C =100°C	66.6
Power Dissipation ^A	P _{DSM}	T _A =25°C	W
		T _A =70°C	4
Junction and Storage Temperature Range	T _J , T _{STG}	-55 to 150	°C

Thermal Data

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^A	R _{θJA}	15	20	°C/W
Maximum Junction-to-Case	R _{θJC}	0.9	1.2	°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 10	μA
I _G SS	Gate-Body leakage current	V _{DS} =0V, V _{GS} = ±16V			± 100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.1		2.2	
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		0.83	1.0	mΩ
		V _{GS} =4.5V, I _D =15A		1.1	1.35	mΩ
g _{FS}	Forward Transconductance	V _{DS} =10V, I _D =20A		140		S
V _{SD}	Diode Forward Voltage	I _S =10A, V _{GS} =0V		0.7	1.1	V
I _S	Maximum Body-Diode Continuous Current ^G				100	A
DYNAMIC PARAMETERS						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =15V, f=1MHz		11 700		pF
C _{oss}	Output Capacitance			3320		pF
C _{rss}	Reverse Transfer Capacitance			360		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1MHz	0.3	1.35	2.7	Ω
SWITCHING PARAMETERS						
Q _g (10V)	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =20A		147	220	nC
Q _g (4.5V)	Total Gate Charge	V _{GS} =10V, V _{DS} =4.5V, I _D =20A		66	100	nC
Q _{gs}	Gate Source Charge			26		nC
Q _{gd}	Gate Drain Charge			8.6		nC
t _{D(on)}	Turn-On DelayTime			43	85	ns
t _r	Turn-On Rise Time	V _{GS} =4.5V, V _{DS} =15V, R _L =0.75Ω,		43	85	ns
t _{D(off)}	Turn-Off DelayTime	R _{GEN} =3Ω		54	100	ns
t _f	Turn-Off Fall Time			15	30	ns
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, di/dt=100A/μs		70	140	ns
Q _{rr}	Body Diode Reverse Recovery Charge	I _F =20A, di/dt=100A/μs		70	140	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.

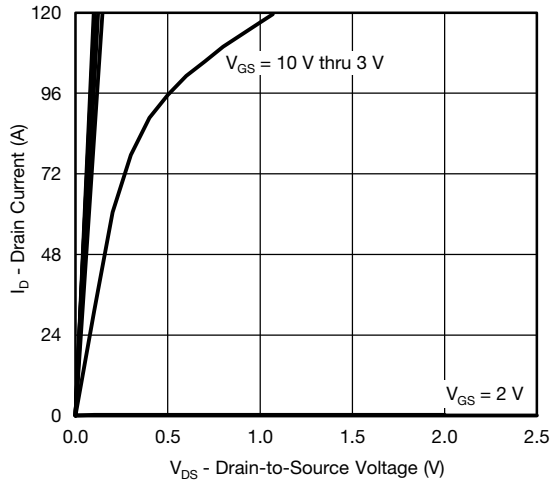
E. The static characteristics in Figures 1 to 6 are obtained using <300μs pulses, duty cycle 0.5% max.

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.

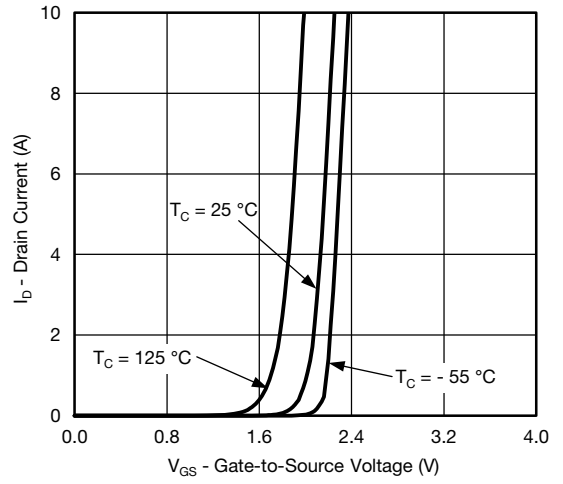
G. The maximum current rating is package limited.

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.

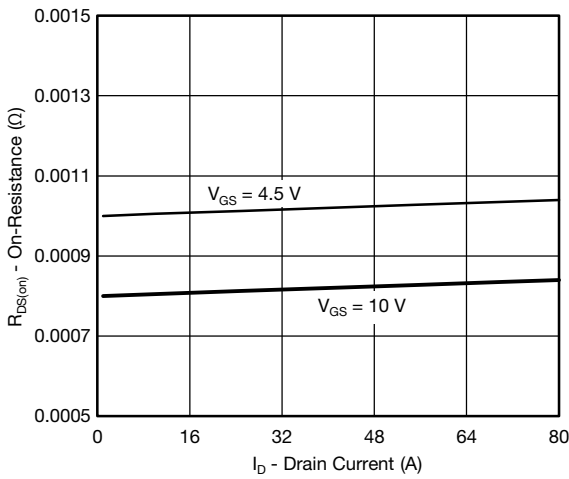
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



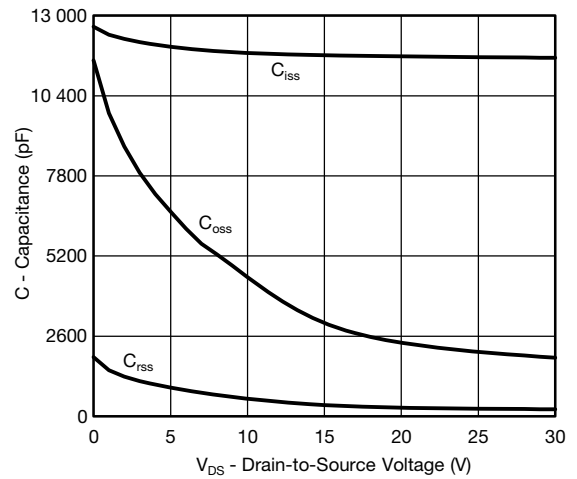
Output Characteristics



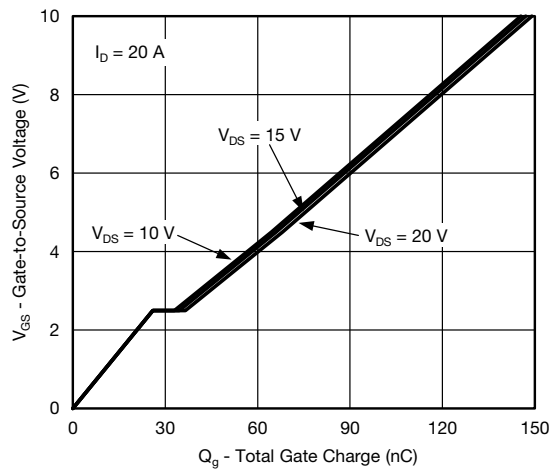
Transfer Characteristics



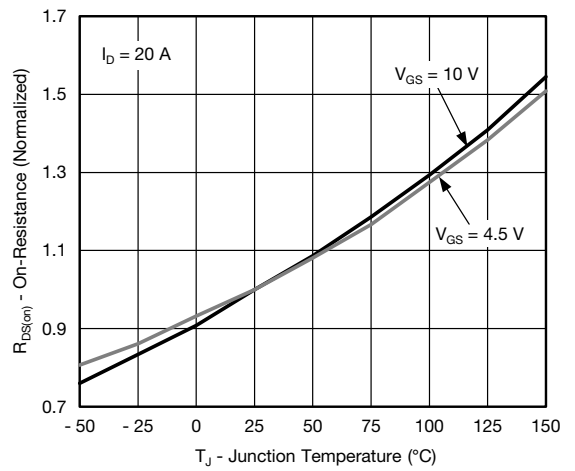
On-Resistance vs. Drain Current



Capacitance

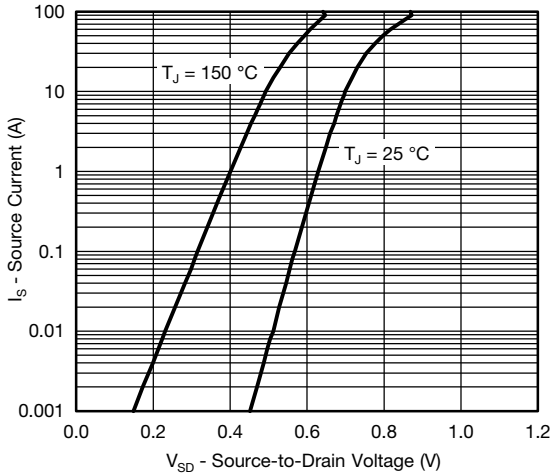


Gate Charge

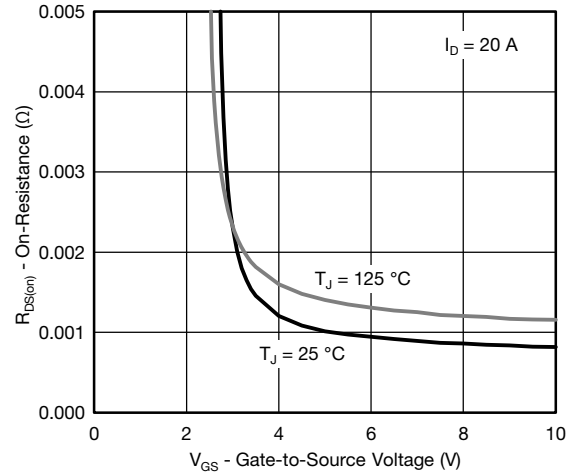


On-Resistance vs. Junction Temperature

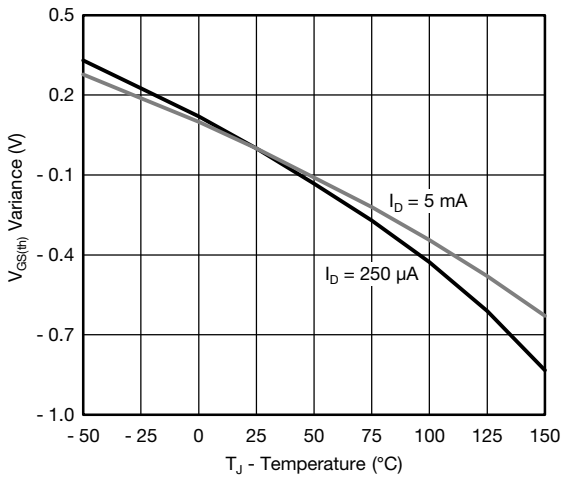
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



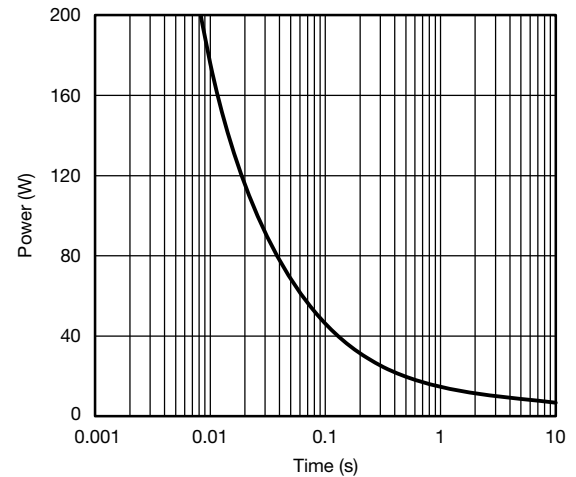
Source-Drain Diode Forward Voltage



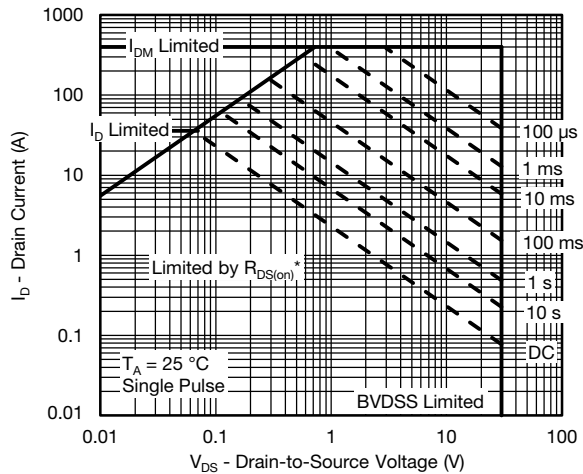
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



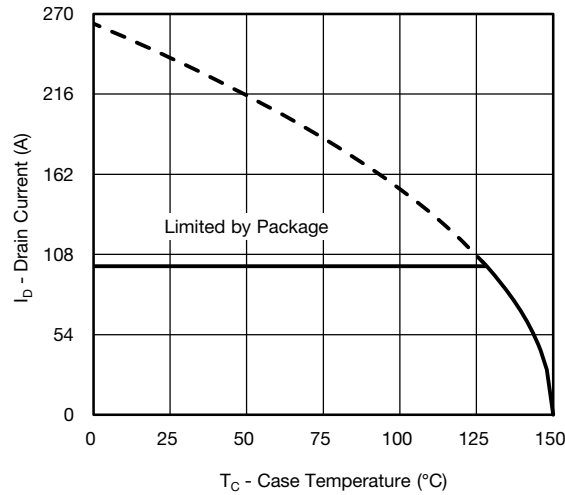
Single Pulse Power, Junction-to-Ambient



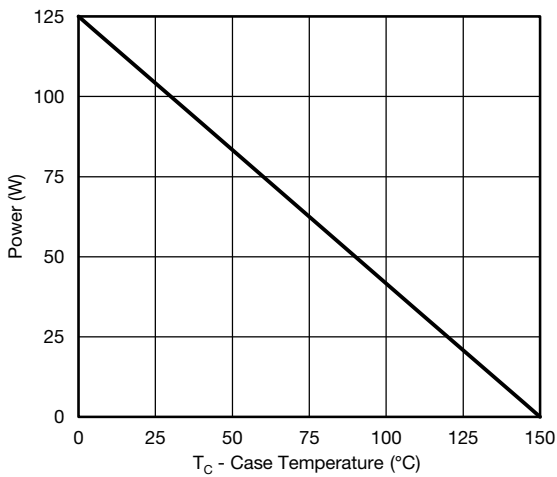
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area

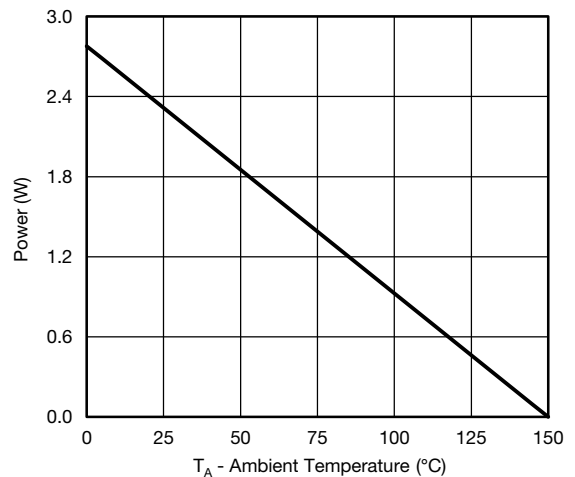
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS



T_C - Case Temperature (°C)
Current Derating*

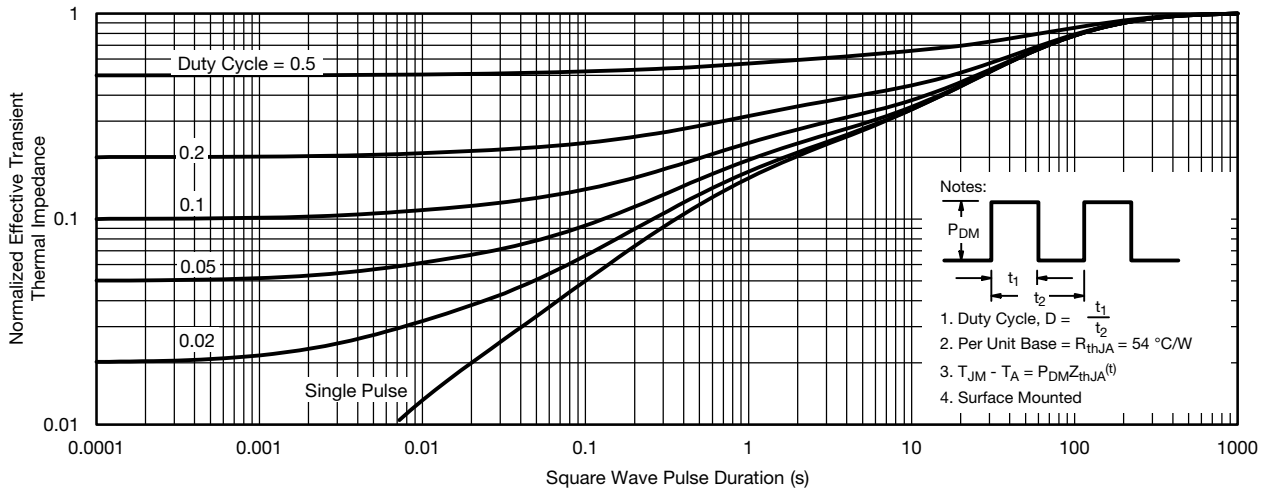


Power, Junction-to-Case

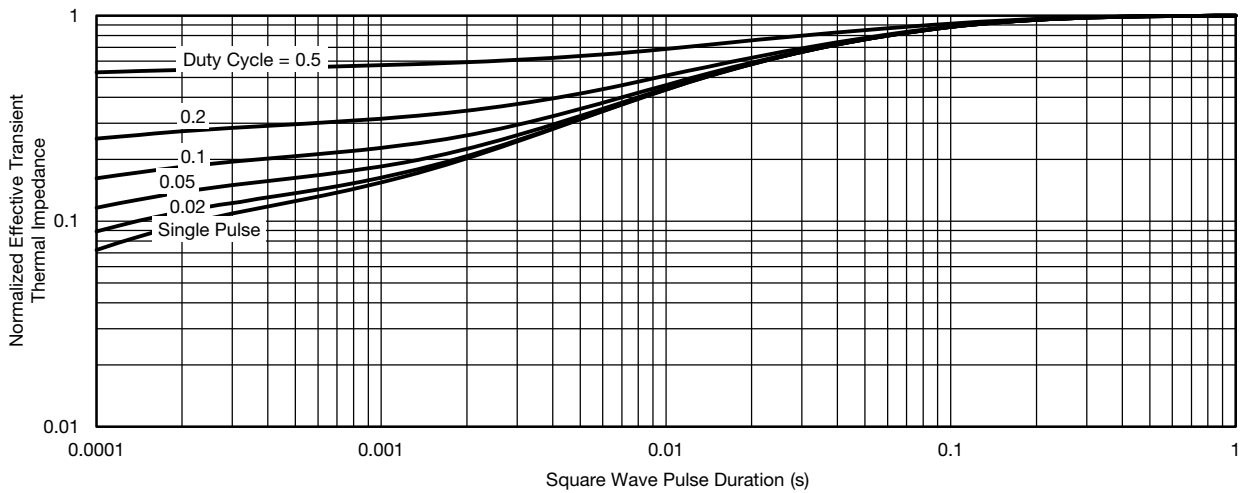


Power, Junction-to-Ambient

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

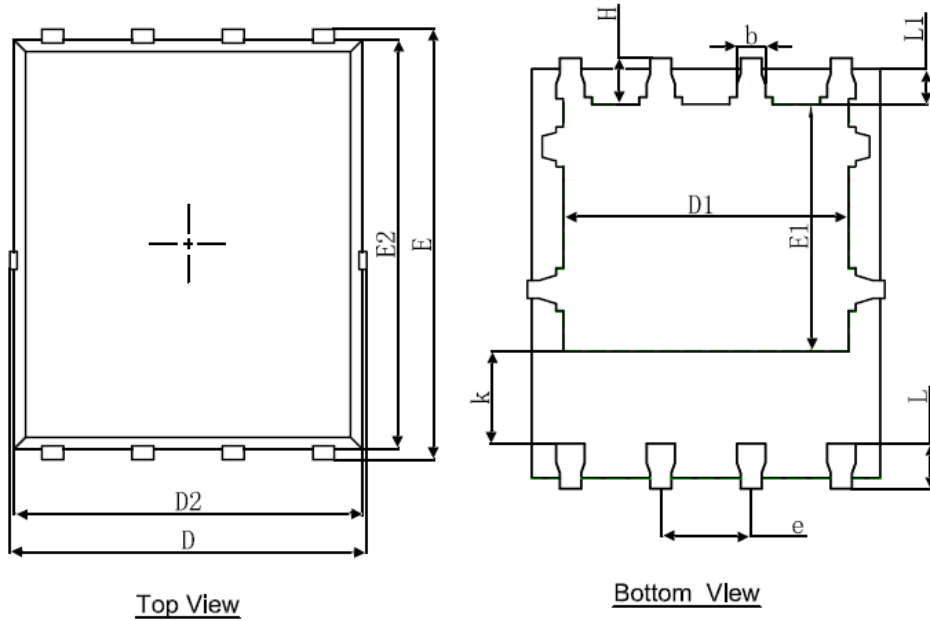


Normalized Thermal Transient Impedance, Junction-to-Ambient



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°