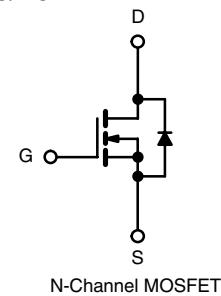
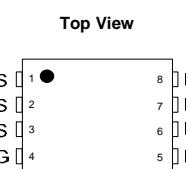
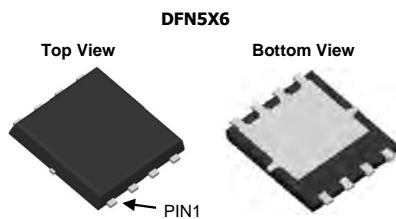


N-Channel 40-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (Typ.)
40	0.0025 at $V_{GS} = 10$ V	120	38 nC
	0.0028 at $V_{GS} = 6.5$ V	105	

FEATURES

- Halogen-free According to IEC 61249-2-21
Definition
- TrenchFET® Power MOSFET
- 100 % R_g Tested
- 100 % UIS Tested



APPLICATIONS

- Synchronous Rectification
- Secondary Side DC/DC

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	40		
Gate-Source Voltage	V_{GS}	± 20	V	
Continuous Drain Current ($T_J = 150$ °C)	$T_C = 25$ °C	I_D	120	A
	$T_C = 70$ °C		80	
	$T_A = 25$ °C		33 ^{b, c}	
	$T_A = 70$ °C		26 ^{b, c}	
Pulsed Drain Current	I_{DM}	360		
Continuous Source-Drain Diode Current	$T_C = 25$ °C	I_S	100	
	$T_A = 25$ °C		4.9 ^{b, c}	
Single Pulse Avalanche Current	I_{AS}	40		
Single Pulse Avalanche Energy	E_{AS}	80	mJ	
Maximum Power Dissipation	$T_C = 25$ °C	P_D	83	W
	$T_C = 70$ °C		53	
	$T_A = 25$ °C		5.4 ^{b, c}	
	$T_A = 70$ °C		3.4 ^{b, c}	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		
Soldering Recommendations (Peak Temperature) ^{d, e}		260	°C	

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, f}	$t \leq 10$ s	R_{thJA}	18	23
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	1.0	1.5 °C/W

Notes:

- a. Based on $T_C = 25$ °C.
- b. Surface mounted on 1" x 1" FR4 board.
- c. $t = 10$ s.
- d. Maximum under steady state conditions is 90 °C/W.
- e. Calculated based on maximum junction temperature. Package limitation current is 80 A.

SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

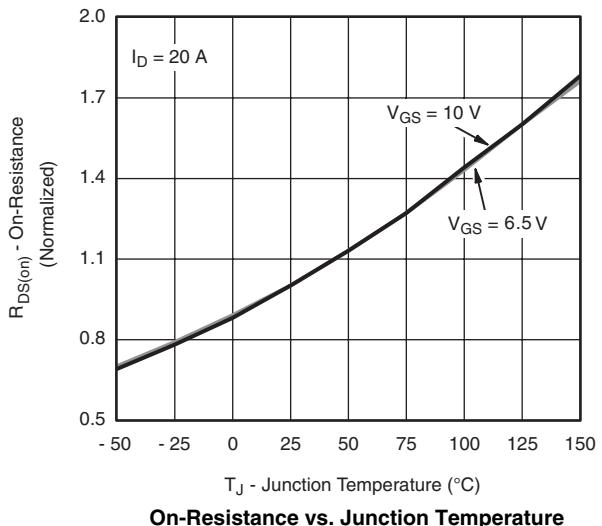
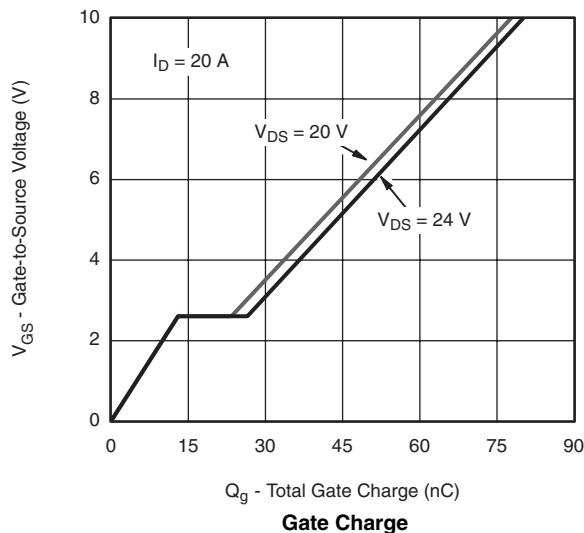
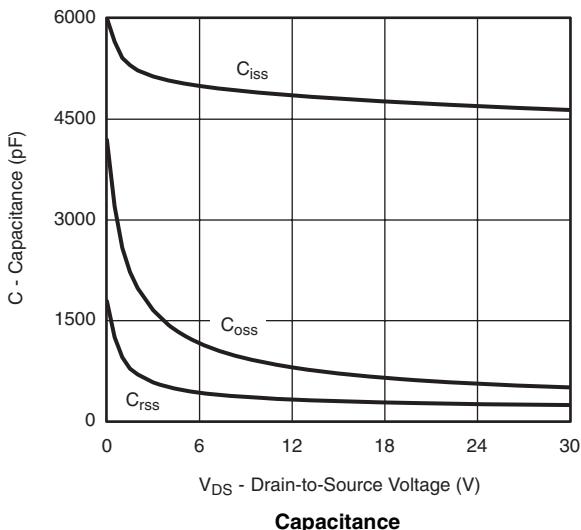
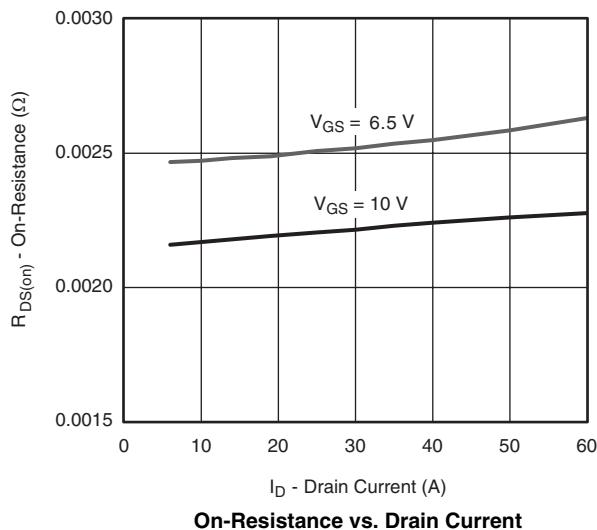
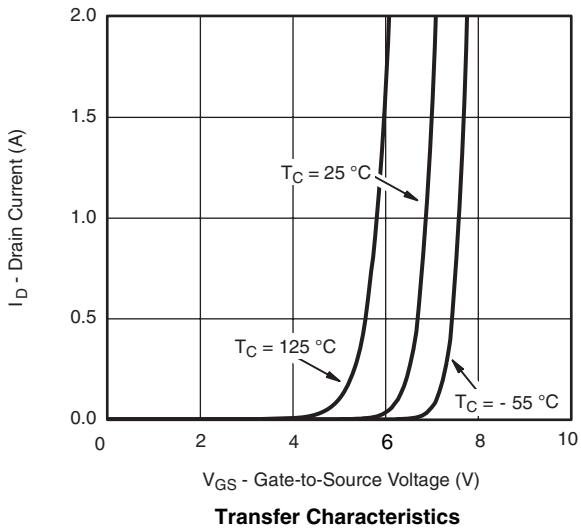
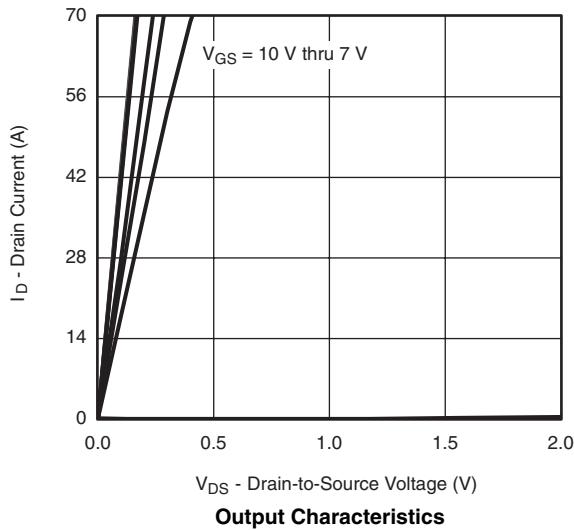
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	40			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250 \mu\text{A}$		43		mV/°C
$V_{GS(\text{th})}$ Temperature Coefficient	$\Delta V_{GS(\text{th})}/T_J$			- 6		
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$	2.0		4.0	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40 \text{ V}$, $V_{GS} = 0 \text{ V}$			1	μA
		$V_{DS} = 40 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 55^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq 5 \text{ V}$, $V_{GS} = 10 \text{ V}$	100			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$, $I_D = 20 \text{ A}$		0.0025		Ω
		$V_{GS} = 6.5 \text{ V}$, $I_D = 20 \text{ A}$		0.0029		
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15 \text{ V}$, $I_D = 20 \text{ A}$		102		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 20 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$		4750		pF
Output Capacitance	C_{oss}			610		
Reverse Transfer Capacitance	C_{rss}			275		
Total Gate Charge	Q_g	$V_{DS} = 20 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 20 \text{ A}$		78	117	nC
				38	57	
Gate-Source Charge	Q_{gs}	$V_{DS} = 20 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 20 \text{ A}$		13		
Gate-Drain Charge	Q_{gd}			11		
Gate Resistance	R_g	$f = 1 \text{ MHz}$	0.2	0.7	1.4	Ω
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = 20 \text{ V}$, $R_L = 2 \Omega$ $I_D \geq 10 \text{ A}$, $V_{GEN} = 10 \text{ V}$, $R_g = 1 \Omega$		14	25	ns
Rise Time	t_r			9	18	
Turn-Off Delay Time	$t_{d(\text{off})}$			41	65	
Fall Time	t_f			9	18	
Turn-On Delay Time	$t_{d(\text{on})}$			33	42	
Rise Time	t_r	$V_{DD} = 20 \text{ V}$, $R_L = 2 \Omega$ $I_D \geq 10 \text{ A}$, $V_{GEN} = 4.5 \text{ V}$, $R_g = 1 \Omega$		22	35	ns
Turn-Off Delay Time	$t_{d(\text{off})}$			42	65	
Fall Time	t_f			13	25	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$		50		A
Pulse Diode Forward Current ^a	I_{SM}			60		
Body Diode Voltage	V_{SD}	$I_S = 5 \text{ A}$		0.75	1.1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 10 \text{ A}$, $dI/dt = 100 \text{ A}/\mu\text{s}$, $T_J = 25^\circ\text{C}$		40	60	ns
Body Diode Reverse Recovery Charge	Q_{rr}			48	72	nC
Reverse Recovery Fall Time	t_a			24		ns
Reverse Recovery Rise Time	t_b			16		

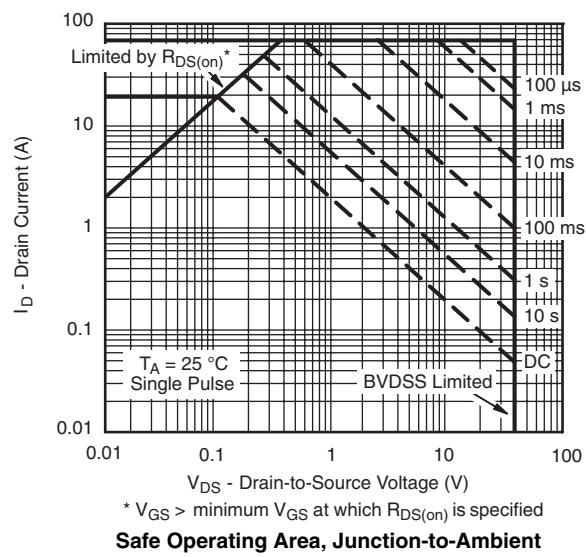
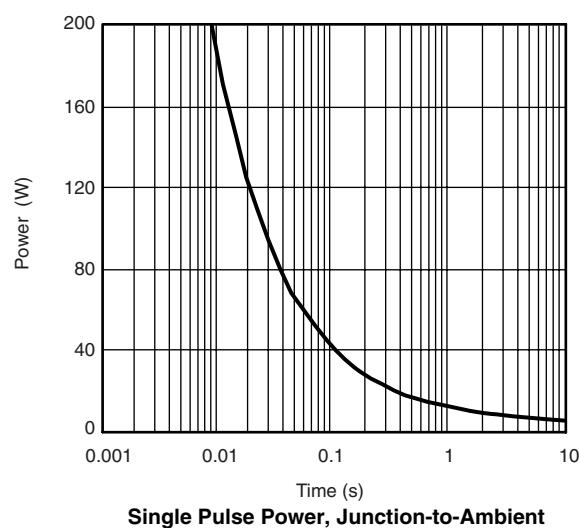
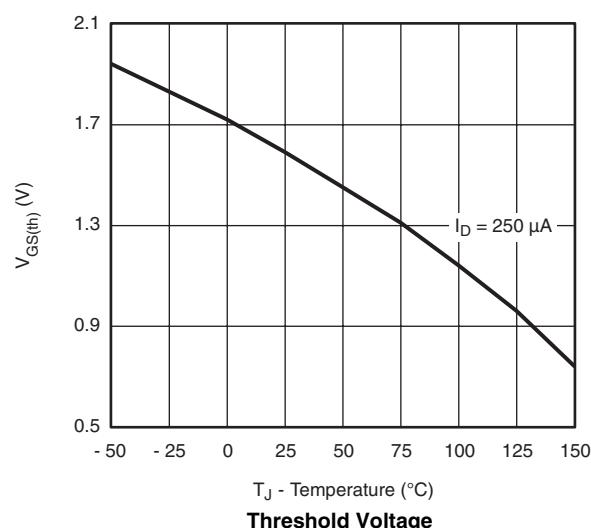
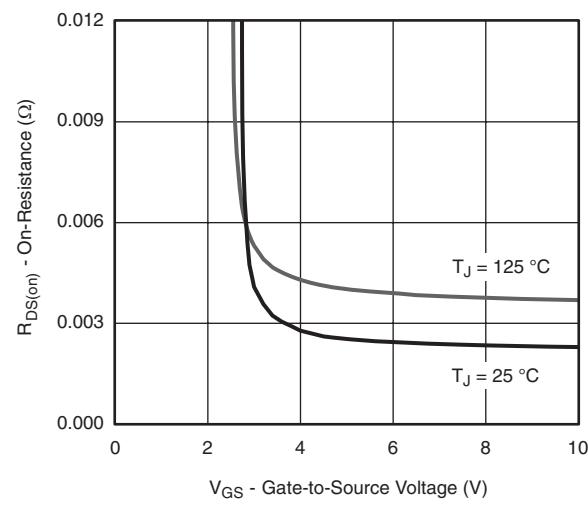
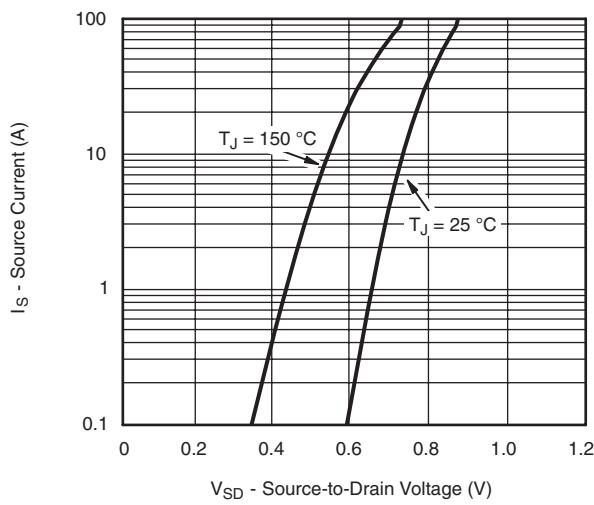
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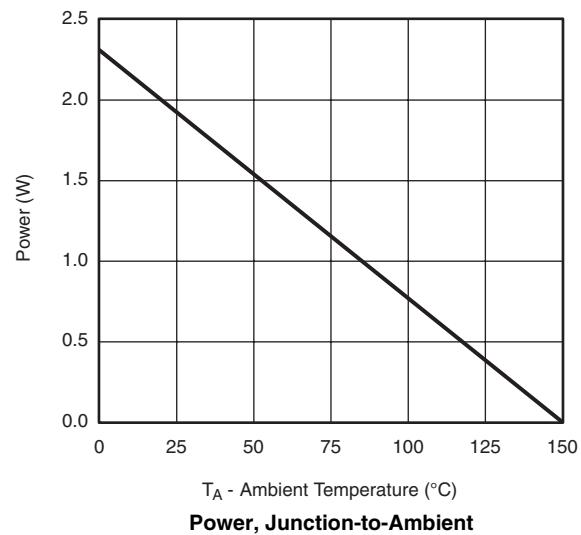
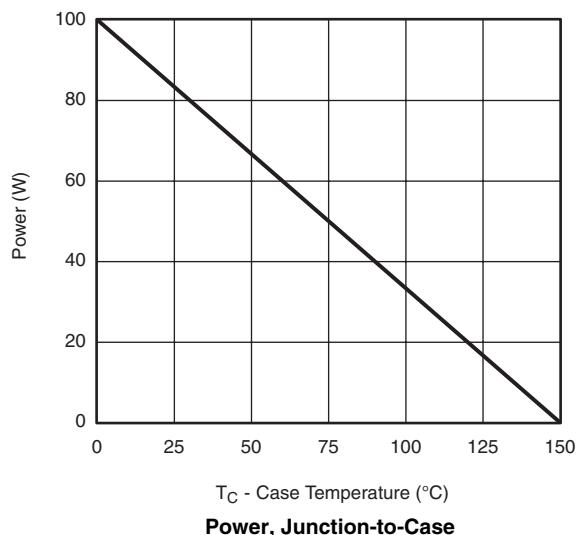
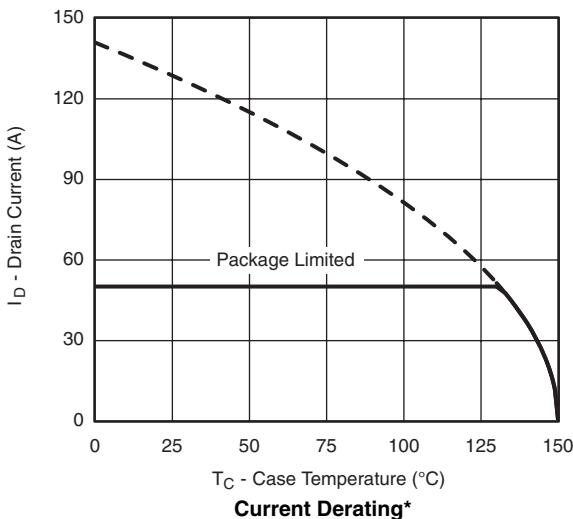
a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$.

b. Guaranteed by design, not subject to production testing.

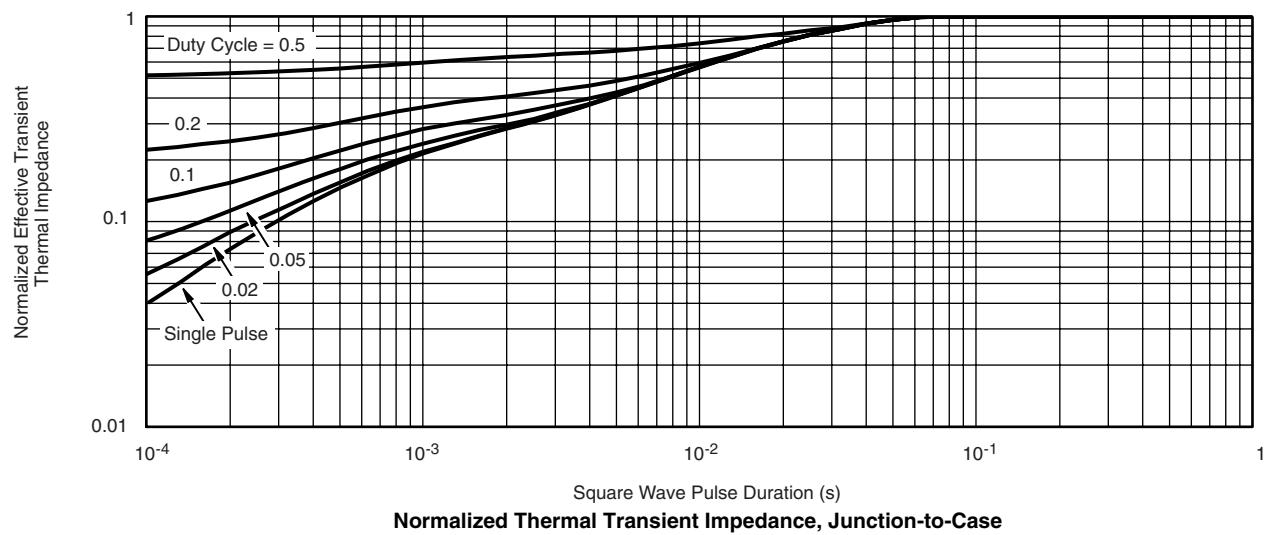
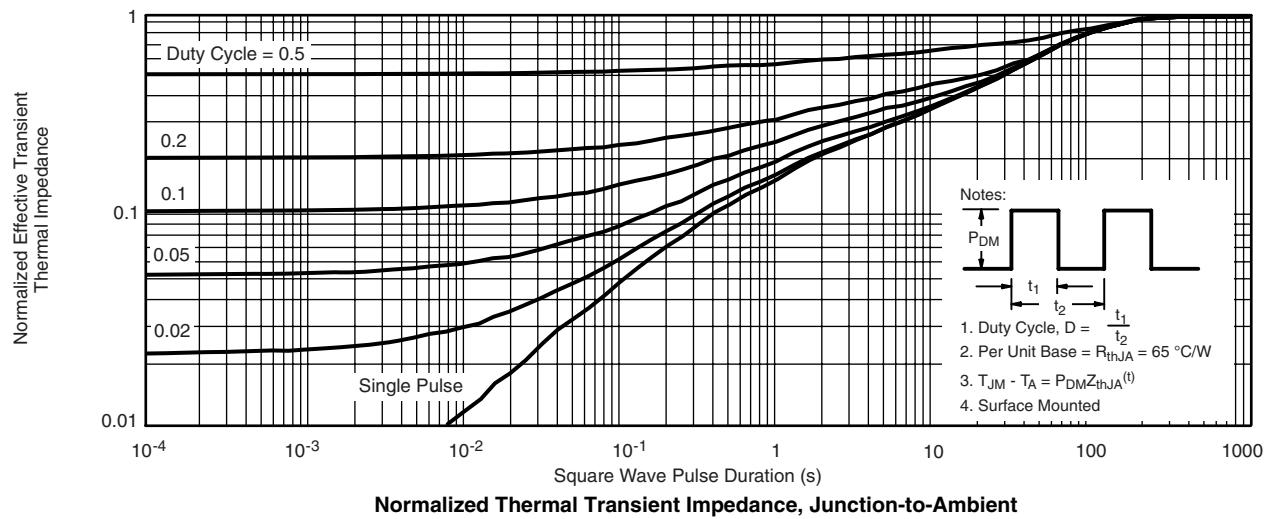
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


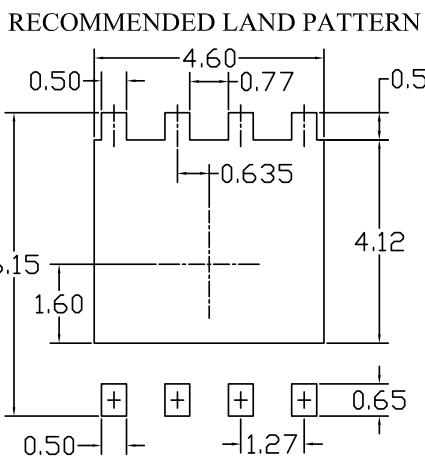
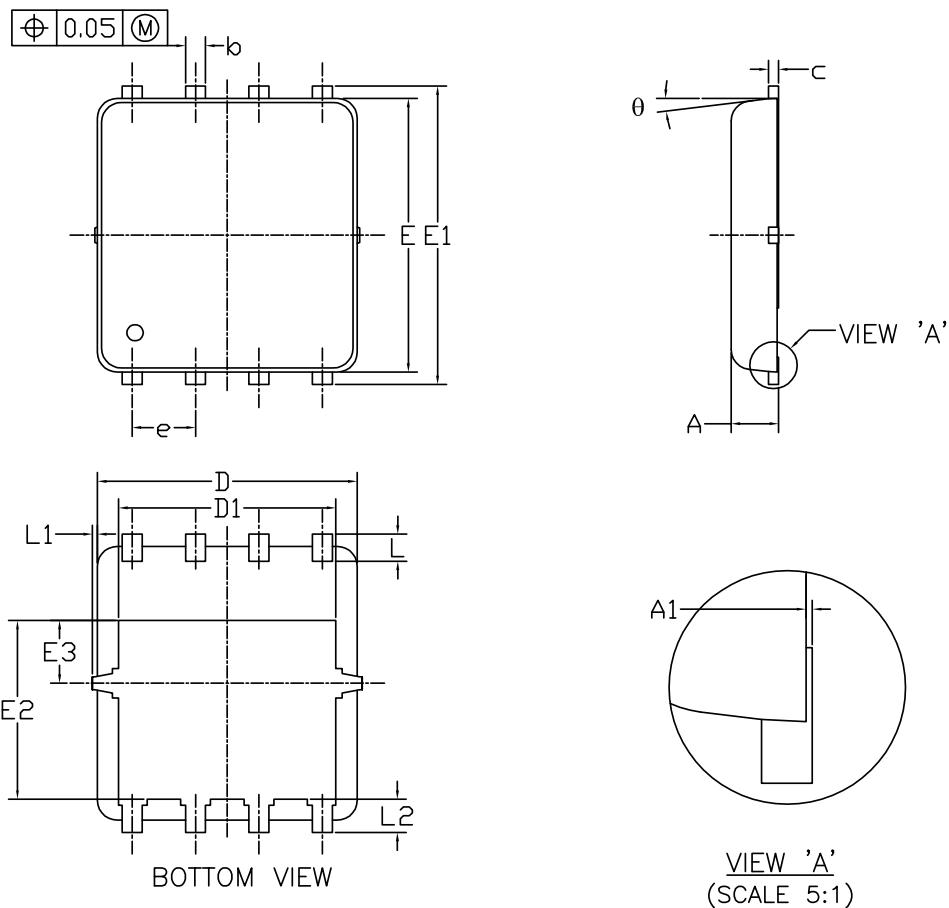
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


* The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


DFN5x6_8L_EP1_P PACKAGE OUTLIN



SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.85	0.95	1.00	0.033	0.037	0.039
A1	0.00	---	0.05	0.000	---	0.002
b	0.30	0.40	0.50	0.012	0.016	0.020
c	0.15	0.20	0.25	0.006	0.008	0.010
D	5.10	5.20	5.30	0.201	0.205	0.209
D1	4.25	4.35	4.45	0.167	0.171	0.175
E	5.45	5.55	5.65	0.215	0.219	0.222
E1	5.95	6.05	6.15	0.234	0.238	0.242
E2	3.525	3.625	3.725	0.139	0.143	0.147
E3	1.175	1.275	1.375	0.046	0.050	0.054
e	1.27 BSC			0.050 BSC		
L	0.45	0.55	0.65	0.018	0.022	0.026
L1	0	---	0.15	0	---	0.006
L2	0.68 REF			0.027 REF		
θ	0°	---	10°	0°	---	10°

UNIT: mm

NOTE

1. PACKAGE BODY SIZES EXCLUDE MOLD FLASH AND GATE BURRS.
MOLD FLASH AT THE NON-LEAD SIDES SHOULD BE LESS THAN 6 MILS EACH.
2. CONTROLLING DIMENSION IS MILLIMETER.
CONVERTED INCH DIMENSIONS ARE NOT NECESSARILY EXACT.

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