

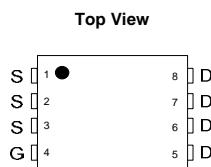
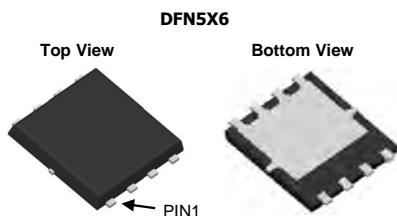
P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (Typ.)
- 30	0.004 at $V_{GS} = - 10$ V	- 120	130 nC
	0.006 at $V_{GS} = - 4.5$ V	- 100	

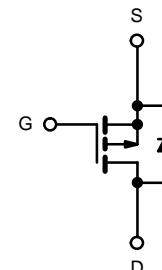
FEATURES

- Halogen-free
- TrenchFET® Power MOSFET
- 100 % R_g Tested



APPLICATIONS

- Notebook
- Load Switch



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	I_D	- 120 ^a	A
		- 100 ^a	
		- 31.6 ^{b, c}	
		- 25.3 ^{b, c}	
Pulsed Drain Current	I_{DM}	- 280	
Continuous Source-Drain Diode Current	I_S	- 80 ^a	A
		- 56 ^{b, c}	
Single Pulse Avalanche Current	I_{AS}	- 60	
Single Pulse Avalanche Energy	E_{AS}	160	mJ
Maximum Power Dissipation	P_D	110	W
		83	
		6.95 ^{b, c}	
		5.0 ^{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}	R_{thJA}	15	20	°C/W
Maximum Junction-to-Case (Drain)	R_{thJC}	0.9	1.2	

Notes:

a. Package limited.

b. Surface Mounted on 1" x 1" FR4 board.

c. $t = 10$ s.

d. The DFN5x6 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.

e. Rework Conditions: manual soldering with a soldering iron is not recommended for leadless components.

f. Maximum under Steady State conditions is 54 °C/W.

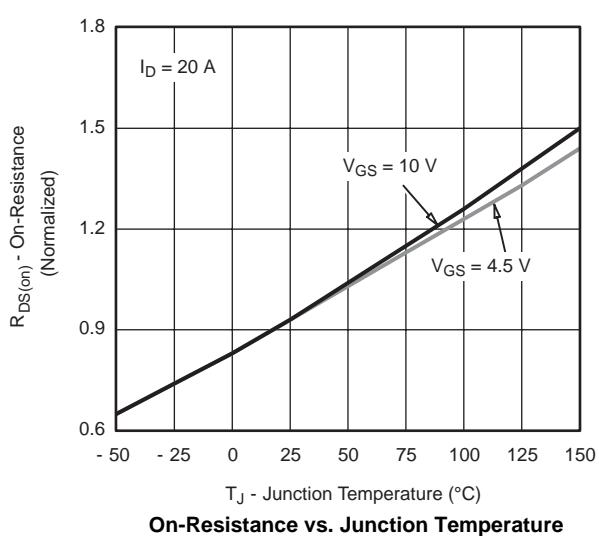
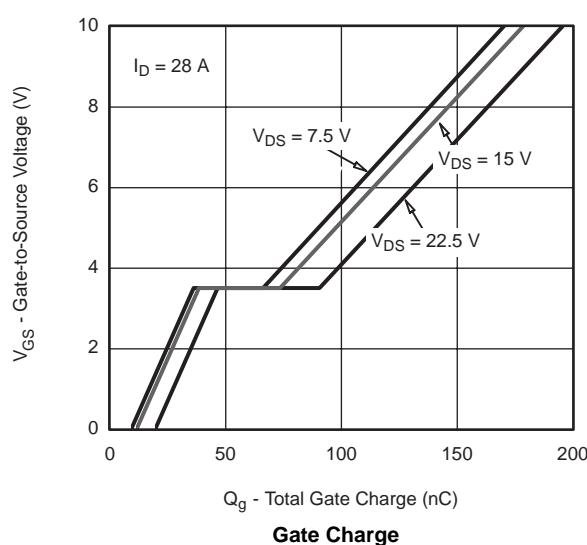
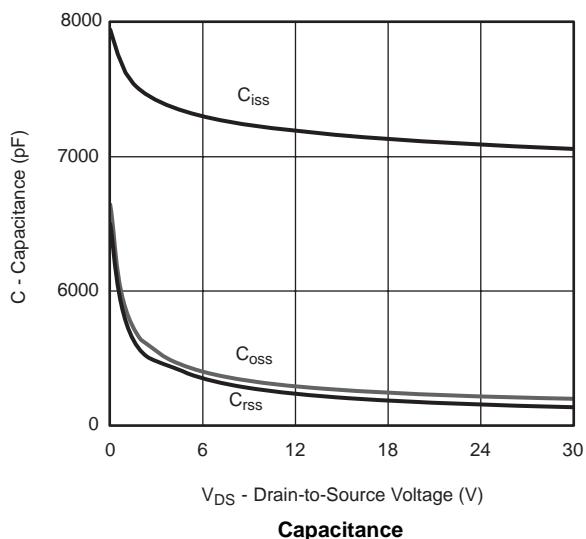
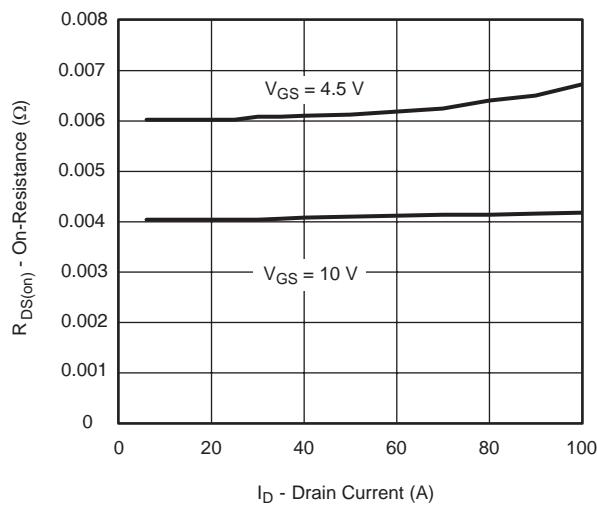
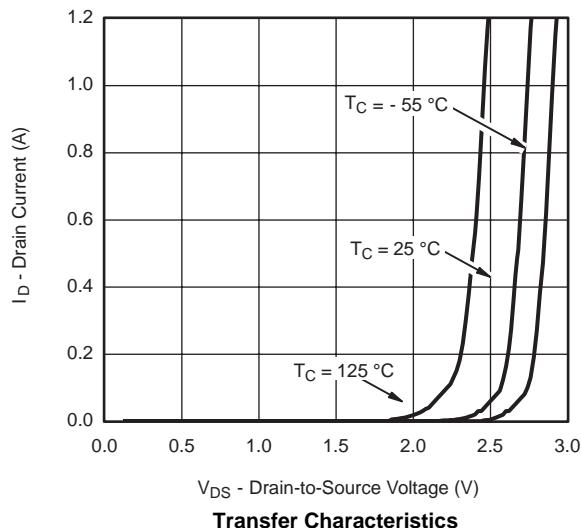
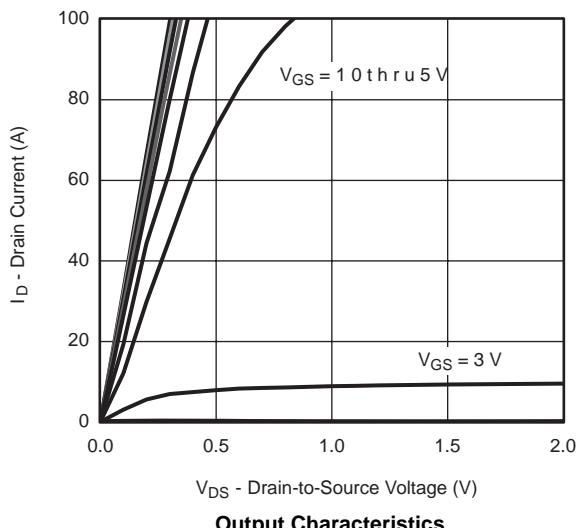
SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

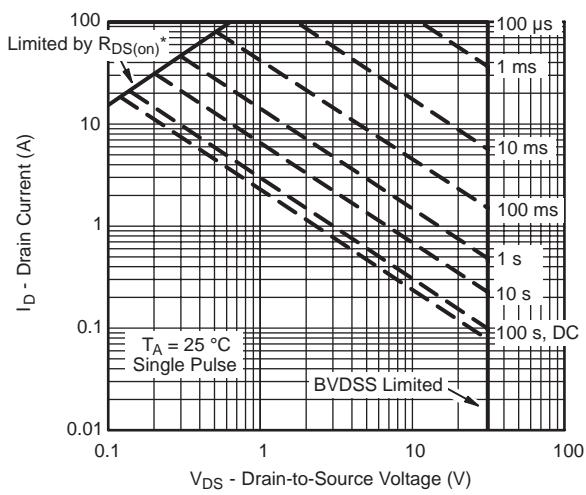
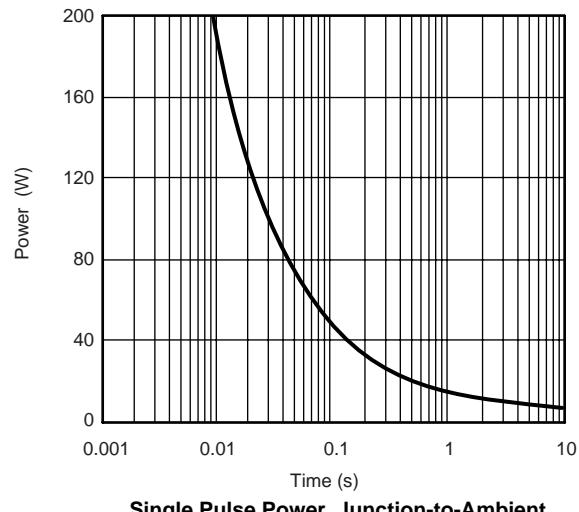
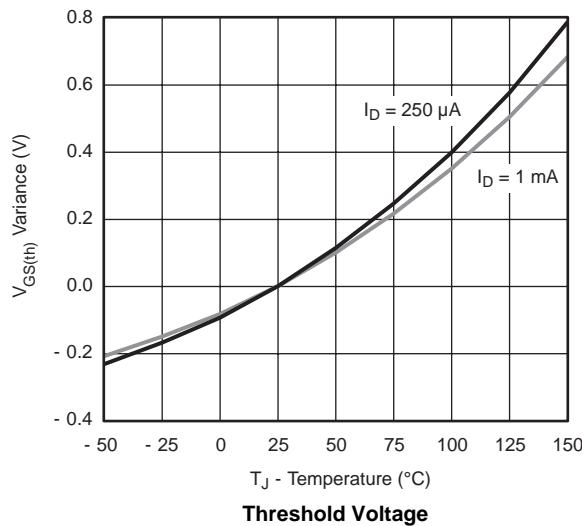
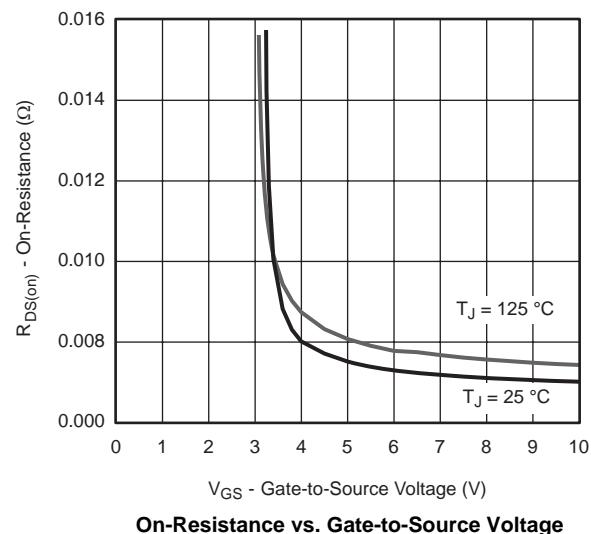
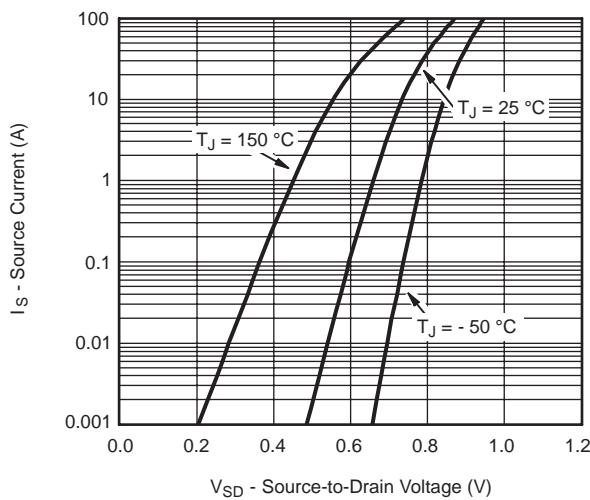
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}, I_D = -250 \mu\text{A}$	-30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250 \mu\text{A}$		-31		mV/°C
$V_{GS(\text{th})}$ Temperature Coefficient	$\Delta V_{GS(\text{th})}/T_J$			6.5		
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	-1.0		-3.0	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}	$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}$			-1	μA
		$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} = -5 \text{ V}, V_{GS} = -10 \text{ V}$	-30			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = -10 \text{ V}, I_D = -20 \text{ A}$		0.004		Ω
		$V_{GS} = -4.5 \text{ V}, I_D = -15 \text{ A}$		0.006		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15 \text{ V}, I_D = -20 \text{ A}$		97		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		7050		pF
Output Capacitance	C_{oss}			1375		
Reverse Transfer Capacitance	C_{rss}			1215		
Total Gate Charge	Q_g	$V_{DS} = -15 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -20 \text{ A}$		130	250	nC
Gate-Source Charge	Q_{gs}			78	130	
Gate-Drain Charge	Q_{gd}			29		
Gate Resistance	R_g		$f = 1 \text{ MHz}$	37		
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = -15 \text{ V}, R_L = 15 \Omega$ $I_D \geq -1.0 \text{ A}, V_{GEN} = -10 \text{ V}, R_g = 1 \Omega$		1.9		Ω
Rise Time	t_r			25	40	ns
Turn-Off Delay Time	$t_{d(\text{off})}$			15	30	
Fall Time	t_f			110	170	
Turn-On Delay Time	$t_{d(\text{on})}$			30	50	
Rise Time	t_r	$V_{DD} = -15 \text{ V}, R_L = 15 \Omega$ $I_D \geq -1.0 \text{ A}, V_{GEN} = -4.5 \text{ V}, R_g = 1 \Omega$		110	170	ns
Turn-Off Delay Time	$t_{d(\text{off})}$			100	150	
Fall Time	t_f			100	150	
				50	75	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			100	A
Pulse Diode Forward Current ^a	I_{SM}				120	
Body Diode Voltage	V_{SD}	$I_S = -5 \text{ A}$		-0.54	-1.1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 3.5 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$		50	100	ns
Body Diode Reverse Recovery Charge	Q_{rr}			65	130	nC
Reverse Recovery Fall Time	t_a			26		ns
Reverse Recovery Rise Time	t_b			24		

Notes:

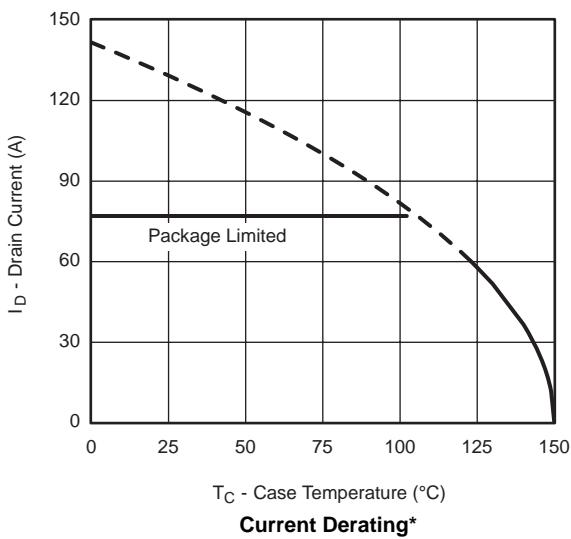
- a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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.

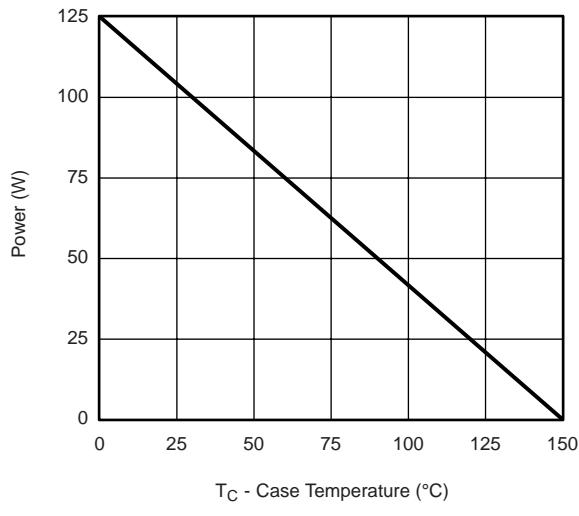
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


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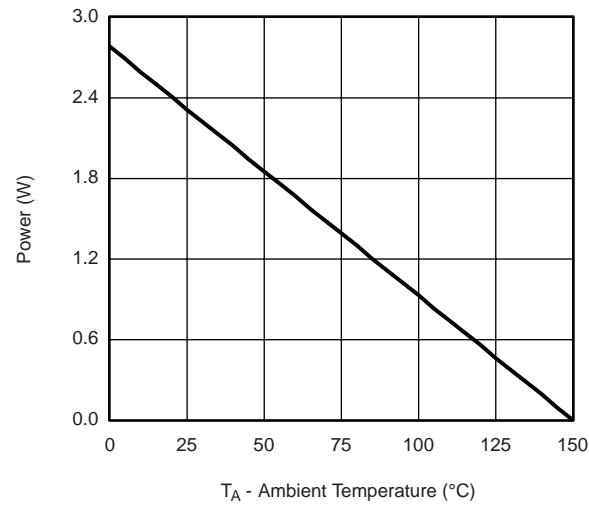
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted
T_C - Case Temperature (°C)

Current Derating*

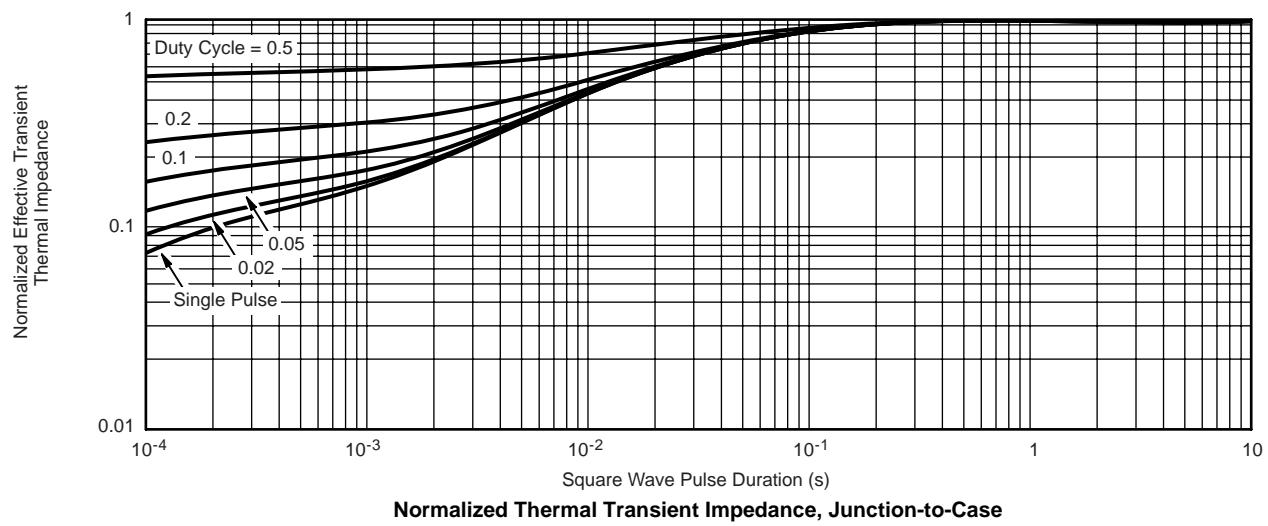
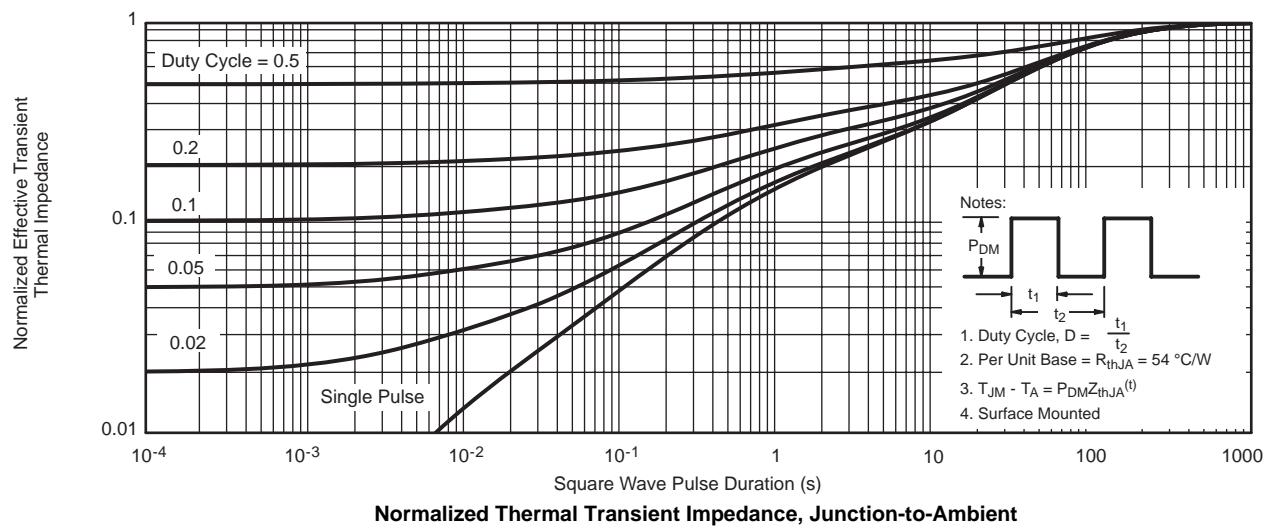
T_C - Case Temperature (°C)

Power, Junction-to-Case

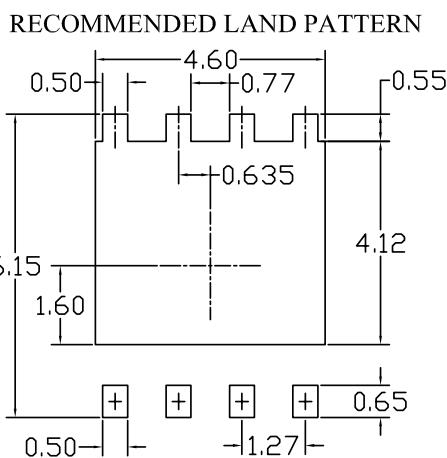
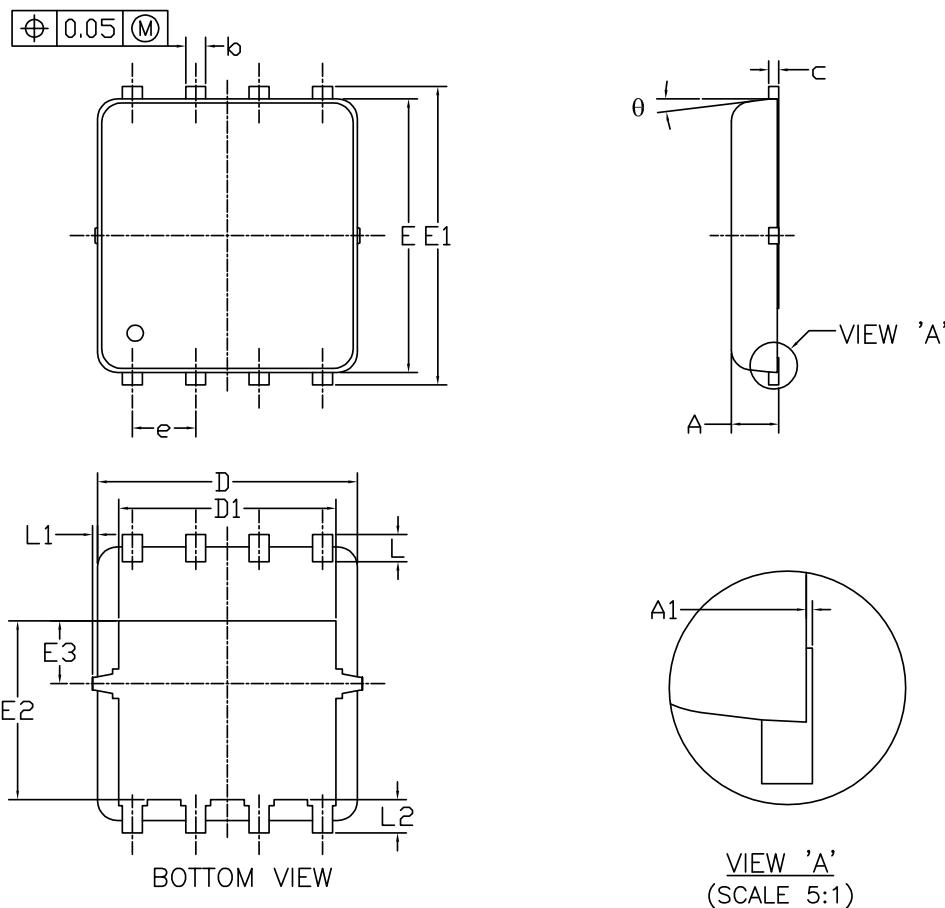
T_A - Ambient Temperature (°C)

Power, Junction-to-Ambient

* 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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