

NTMD4820NR2G-VB Datasheet

Dual N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (Typ.)
30	0.016 at $V_{GS} = 10$ V	8.5	7.1
	0.020 at $V_{GS} = 4.5$ V	7.6	

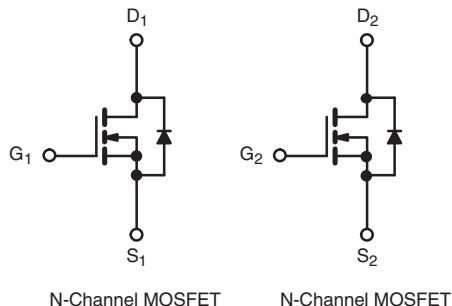
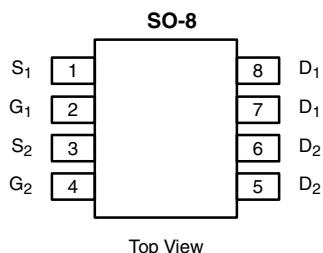
FEATURES

- Trench Power MOSFET
- 100 % R_g Tested
- 100 % UIS Tested
- Compliant to RoHS Directive 2002/95/EC


RoHS
 COMPLIANT

APPLICATIONS

- Notebook System Power
- Low Current DC/DC



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	8.5 7.5 7.2 ^{b, c} 5.9 ^{b, c}	
Pulsed Drain Current	I_{DM}	30	A
Source-Drain Current Diode Current	I_S	2.8 1.8 ^{b, c}	
Pulsed Source-Drain Current	I_{SM}	30	
Single Pulse Avalanche Current	I_{AS}	10	
Single Pulse Avalanche Energy	E_{AS}	5	
Maximum Power Dissipation	P_D	3.1 2.0 2.0 ^{b, c} 1.25 ^{b, c}	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typ.	Max.	Unit
Maximum Junction-to-Ambient ^{b, d}	R_{thJA}	52	62.5	°C/W
Maximum Junction-to-Foot (Drain)	R_{thJF}	30	40	

Notes:

a. Based on $T_C = 25$ °C.

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

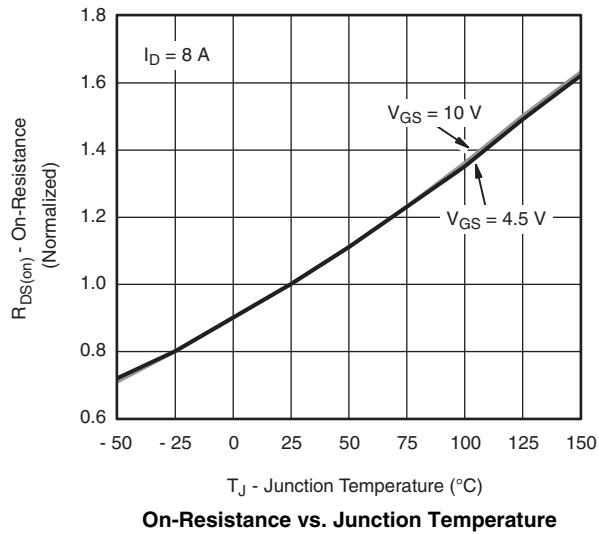
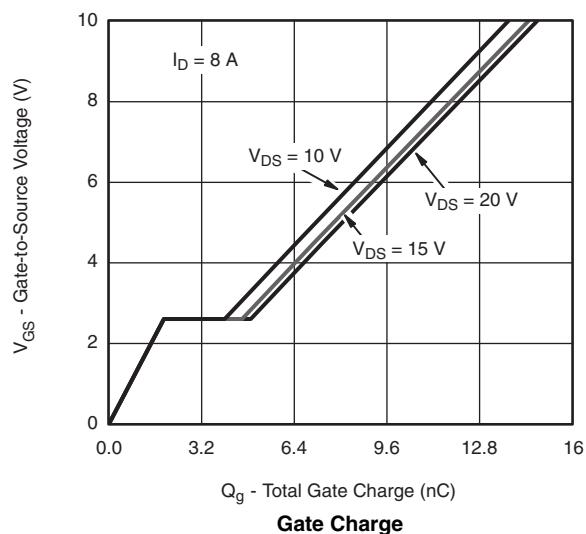
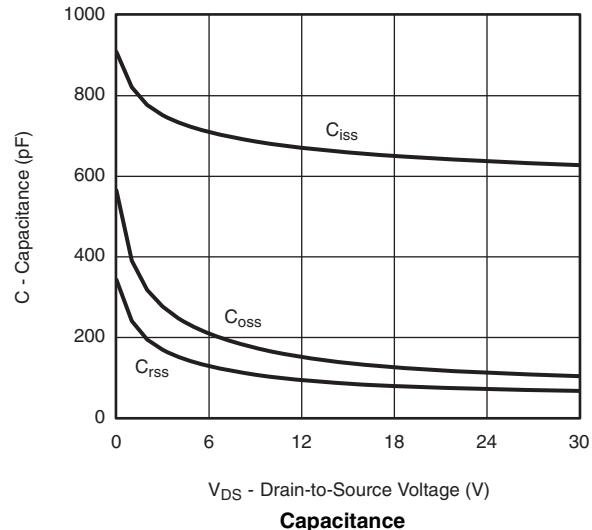
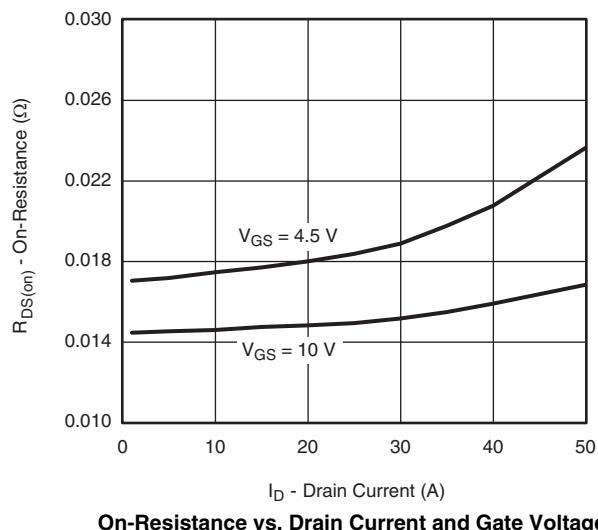
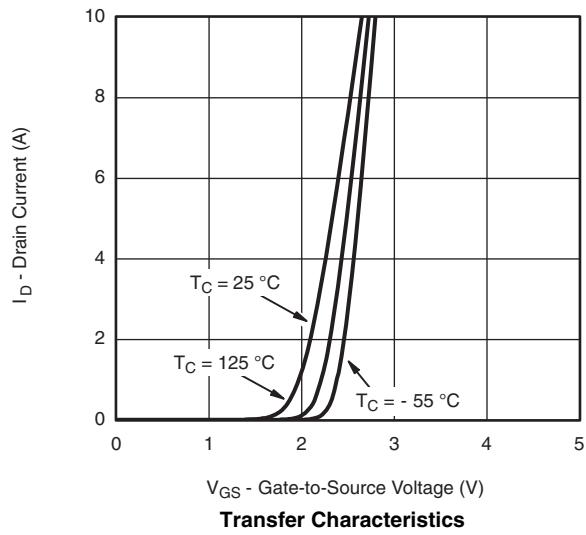
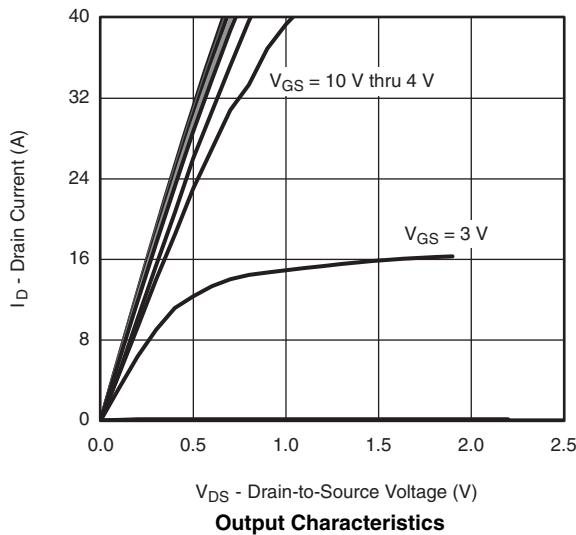
c. $t = 10$ s.

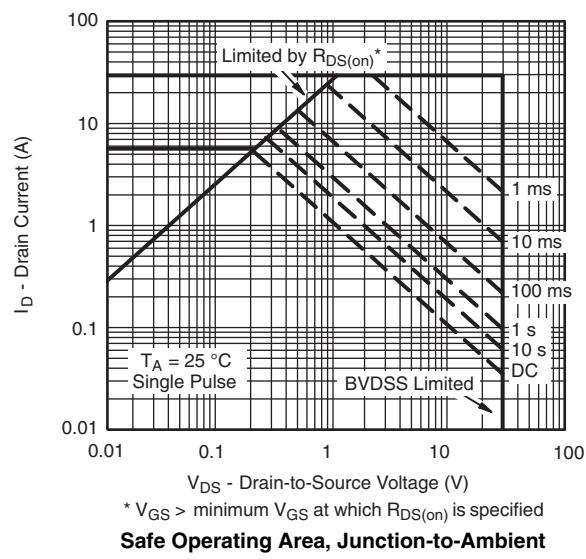
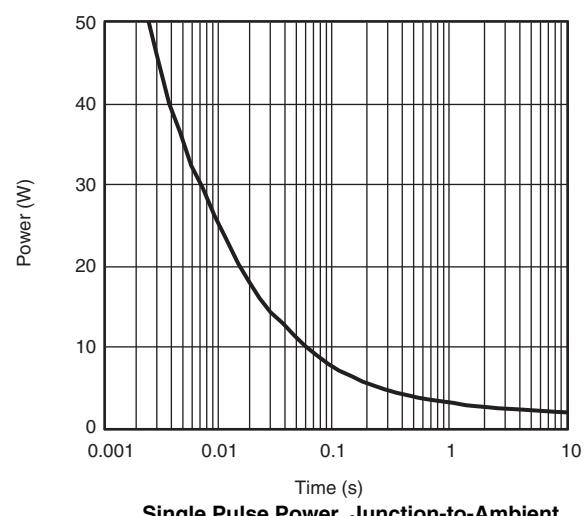
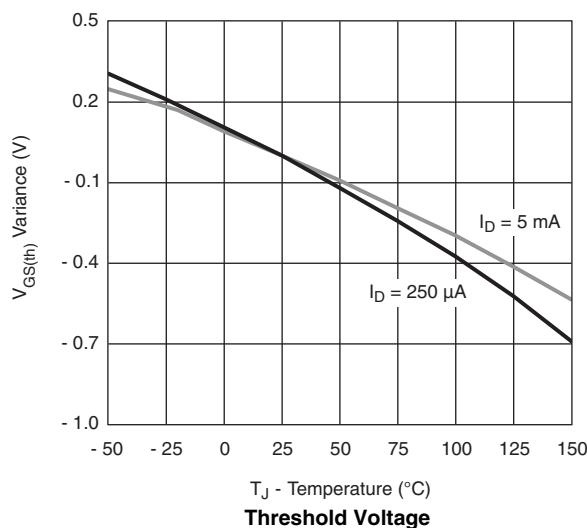
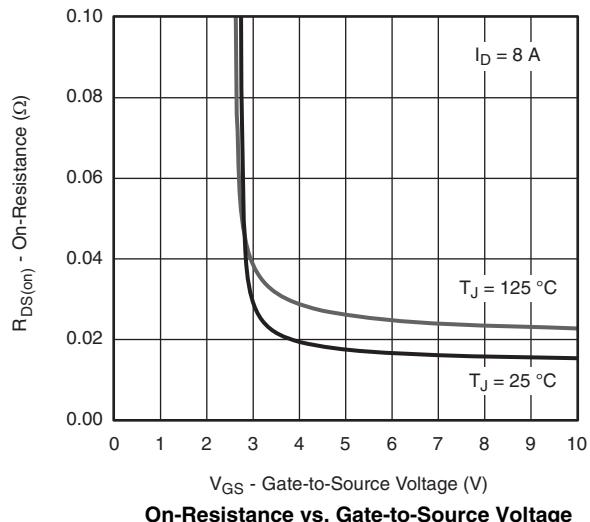
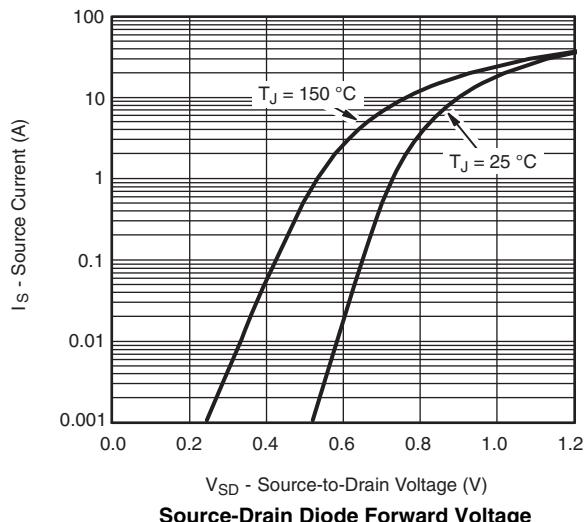
d. Maximum under steady state conditions is 110 °C/W.

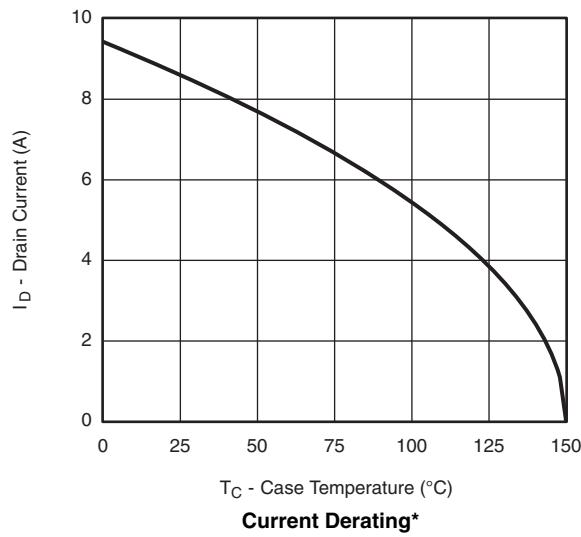
SPECIFICATIONS ($T_J = 25^\circ\text{C}$, unless otherwise noted)

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	$\Delta V_{DS}/T_J$	$I_D = 250 \mu\text{A}$		3.0		$\text{mV}/^\circ\text{C}$	
$V_{GS(\text{th})}$ Temperature Coefficient	$\Delta V_{GS(\text{th})}/T_J$	$I_D = 250 \mu\text{A}$		- 5.2			
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$	1.2		2.5	V	
Gate-Body 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 ^b	$I_{D(\text{on})}$	$V_{DS} = 5 \text{ V}$, $V_{GS} = 10 \text{ V}$	20			A	
Drain-Source On-State Resistance ^b	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$, $I_D = 8 \text{ A}$		0.016		Ω	
		$V_{GS} = 4.5 \text{ V}$, $I_D = 5 \text{ A}$		0.020			
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15 \text{ V}$, $I_D = 8 \text{ A}$		27		S	
Dynamic^a							
Input Capacitance	C_{iss}	$V_{DS} = 15 \text{ V}$, $V_{GS} = 0 \text{ V}$, $I_D = 1 \text{ MHz}$		660		pF	
Output Capacitance	C_{oss}			140			
Reverse Transfer Capacitance	C_{rss}			86			
Total Gate Charge	Q_g	$V_{DS} = 15 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 8 \text{ A}$		14.5	22	nC	
Gate-Source Charge	Q_{gs}	$V_{DS} = 15 \text{ V}$, $V_{GS} = 4.5 \text{ V}$, $I_D = 8 \text{ A}$		7.1	11		
Gate-Drain Charge	Q_{gd}			1.9			
Gate Resistance	R_g		$f = 1 \text{ MHz}$	0.5	2.6	5.2	Ω
Turn-On Delay Time	$t_{d(\text{on})}$				14	28	ns
Rise Time	t_r	$V_{DD} = 15 \text{ V}$, $R_L = 3 \Omega$ $I_D \approx 5 \text{ A}$, $V_{GEN} = 4.5 \text{ V}$, $R_g = 1 \Omega$		45	80		
Turn-Off Delay Time	$t_{d(\text{off})}$			18	35		
Fall Time	t_f			12	24		
Turn-On Delay Time	$t_{d(\text{on})}$			7	14		
Rise Time	t_r	$V_{DD} = 15 \text{ V}$, $R_L = 3 \Omega$ $I_D \approx 5 \text{ A}$, $V_{GEN} = 10 \text{ V}$, $R_g = 1 \Omega$		10	20		
Turn-Off Delay Time	$t_{d(\text{off})}$			15	30		
Fall Time	t_f			7	14		
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			2.8	A	
Pulse Diode Forward Current ^a	I_{SM}				30		
Body Diode Voltage	V_{SD}	$I_S = 2 \text{ A}$		0.77	1.1	V	
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 5 \text{ A}$, $dI/dt = 100 \text{ A}/\mu\text{s}$, $T_J = 25^\circ\text{C}$		17	34	ns	
Body Diode Reverse Recovery Charge	Q_{rr}			9	18	nC	
Reverse Recovery Fall Time	t_a			10		nS	
Reverse Recovery Rise Time	t_b			7			

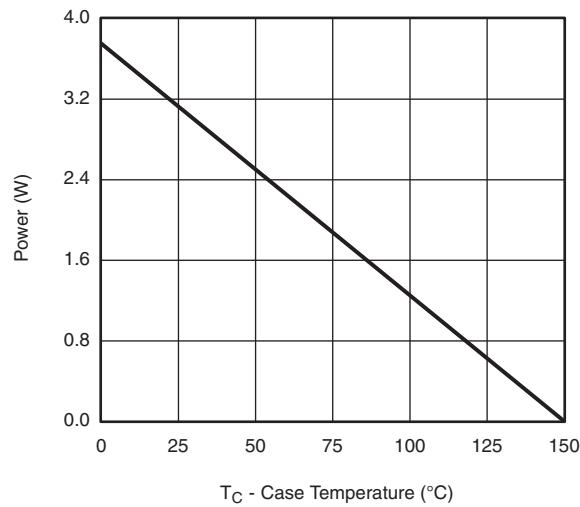
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


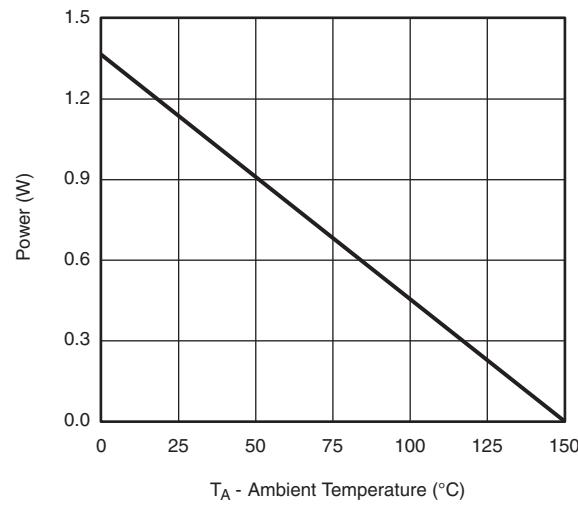
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


Current Derating*



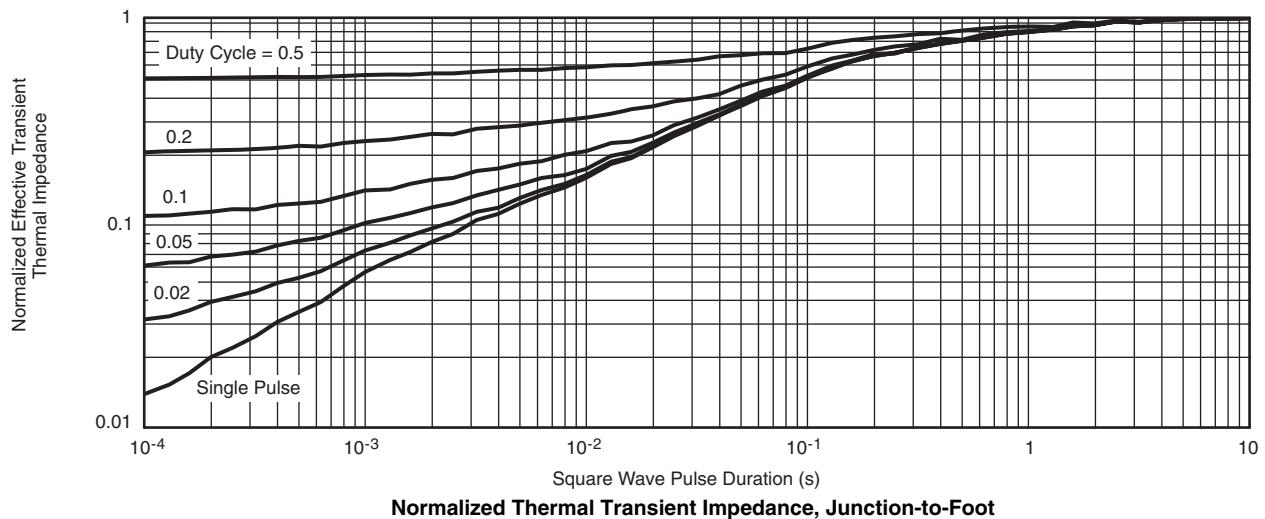
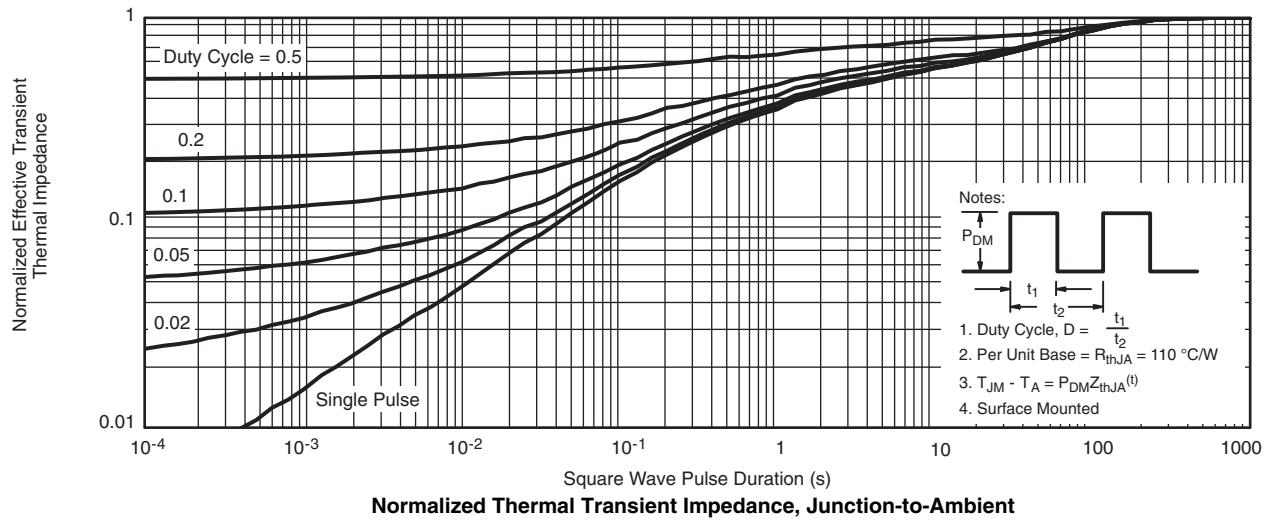
Power Derating, Junction-to-Foot



Power Derating, Junction-to-Ambient

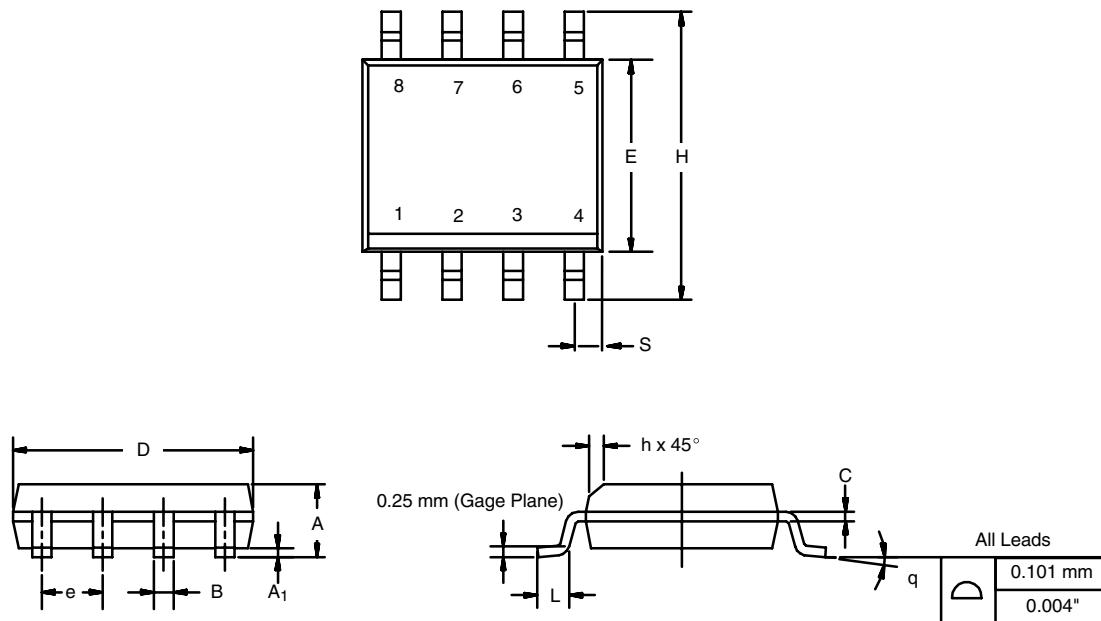
* The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



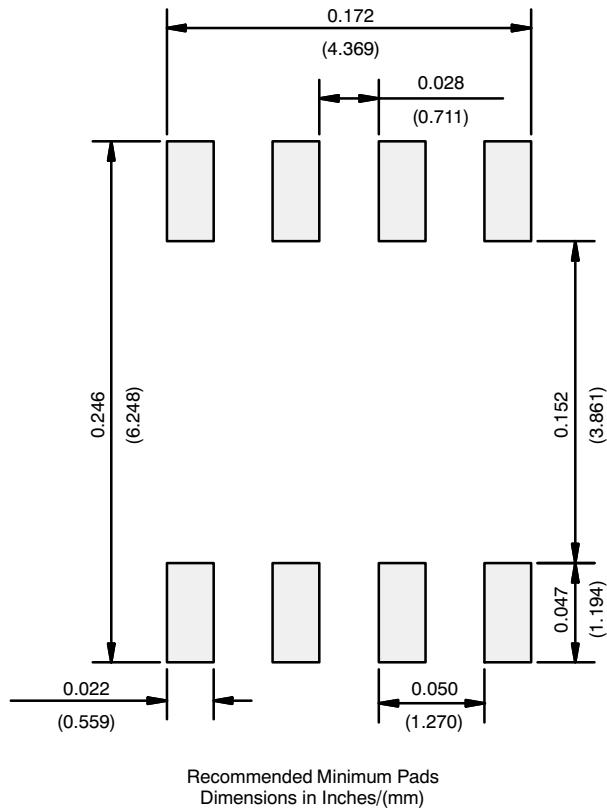
SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A ₁	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026
ECN: C-06527-Rev. I, 11-Sep-06				
DWG: 5498				

RECOMMENDED MINIMUM PADS FOR SO-8



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