NTLTS3107P

Power MOSFET
–20 V, –8.3 A, Single P–Channel, Micro8 Leadless Package

Features

- Low $R_{DS(on)}$ for Extended Battery Life
- Surface Mount Micro8 Leadless for Improved Thermal Performance
- Low Profile (<1.0 mm) Optimal for Portable Designs
- Low Turn–On Voltage
- This is a Pb–Free Device

Applications

- Optimized for Load Management Applications
- Charge Control in Battery Powered Systems
- Cell Phones, DSC, Notebooks, Portable Games, etc.

MAXIMUM RATINGS (T_J = 25°C unless otherwise stated)

Parameter			Symbol	Value	Unit
Drain–to–Source Voltage			V_{DSS}	–20	V
Gate–to–Source Voltage			V_{GS}	±8.0	V
Continuous Drain Current (Note 1)	Steady State	T_A = 25°C	I_D	–8.3	A
		T_A = 85°C		–6.0	
	t ≤ 10 s	T_A = 25°C		–12	
Power Dissipation (Note 1)	Steady State	T_A = 25°C	P_D	1.6	W
	t ≤ 10 s			3.3	
Continuous Drain Current (Note 2)	Steady State	T_A = 25°C	I_D	–5.9	A
		T_A = 85°C		–3.7	
Power Dissipation (Note 2)		T_A = 25°C	P_D	0.8	W
Pulsed Drain Current (Note 1)	t_p = 10 μs		I_{DM}	–25	A
Operating Junction and Storage Temperature			T_J, T_{STG}	–55 to 150	°C
Source Current (Body Diode)			I_S	–1.6	A
Lead Temperature for Soldering Purposes (1/8 in from case for 10 s)			T_L	260	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Unit
Junction–to–Ambient – Steady State (Note 1)	$R_{\theta JA}$	80	°C/W
Junction–to–Ambient – t ≤ 10 s (Note 1)	$R_{\theta JA}$	38	°C/W
Junction–to–Ambient – Steady State (Note 2)	$R_{\theta JA}$	160	°C/W

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Surface–mounted on FR4 board using 1 sq. in. pad size (Cu. area = 1.127 sq. in. [1 oz] including traces).
2. Surface–mounted on FR4 board using minimum recommended pad size (Cu. area = TBD sq. in.).

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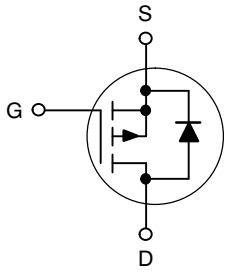
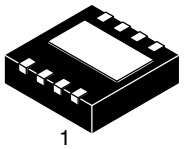
$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D MAX
–20 V	12.2 mΩ @ –4.5 V	–8.3 A
	15.6 mΩ @ –2.5 V	
	26.2 mΩ @ –1.8 V	

P–Channel MOSFET



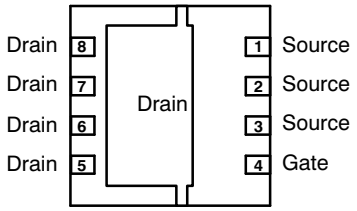


Micro8 Leadless CASE 846C

MARKING DIAGRAM

A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb–Free Package

PIN ASSIGNMENT



(Bottom View)

ORDERING INFORMATION

Device	Package	Shipping†
NTLTS3107PR2G	Micro8 (Pb–Free)	2500/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
OFF CHARACTERISTICS							
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = −250 μA		−20			V
Drain−to−Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$				11		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = −16 V	T_J = 25°C			−10	μA
Gate−to−Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8.0 V				±100	nA
ON CHARACTERISTICS (Note 3)							
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = −250 μA		−0.45		−1.2	V
Negative Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$				3.4		mV/°C
Drain−to−Source On Resistance	$R_{DS(on)}$	V_{GS} = −4.5 V, I_D = −8.0 A			12.2	16	mΩ
		V_{GS} = −2.5 V, I_D = −7.0 A			15.6	21	
		V_{GS} = −1.8 V, I_D = −5.8 A			26.2		
Forward Transconductance	g_{FS}	V_{DS} = −5 V, I_D = −8.0 A			25		S
CHARGES AND CAPACITANCES							
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1 MHz, V_{DS} = −16 V			5900	6500	pF
Output Capacitance	C_{OSS}				625	675	
Reverse Transfer Capacitance	C_{RSS}				425	525	
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = −4.5 V, V_{DS} = −16 V, I_D = −8.0 A			55	70	nC
Threshold Gate Charge	$Q_{G(TH)}$				3.0		
Gate−to−Source Gate Charge	Q_{GS}				7.0		
Gate−to−Drain “Miller” Charge	Q_{GD}				11		
SWITCHING CHARACTERISTICS (Note 4)							
Turn−On Delay Time	$t_{d(on)}$	V_{GS} = −4.5 V, V_{DS} = −10 V, I_D = −8.0 A, R_G = 3.0 Ω			30		ns
Rise Time	t_r				20		
Turn−Off Delay Time	$t_{d(off)}$				250		
Fall Time	t_f				80		
DRAIN−SOURCE DIODE CHARACTERISTICS (Note 3)							
Forward Diode Voltage	V_{SD}	V_{GS} = 0 V, I_S = −1.6 A	T_J = 25°C		−0.7	−1.2	V
			T_J = 125°C		0.5		
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, dI_S/dt = 100 A/μs, I_S = −1.6 A			75	100	ns
Charge Time	t_a				28		
Discharge Time	t_b				47		
Reverse Recovery Charge	Q_{RR}				81.5		nC

3. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.
4. Switching characteristics are independent of operating junction temperatures.

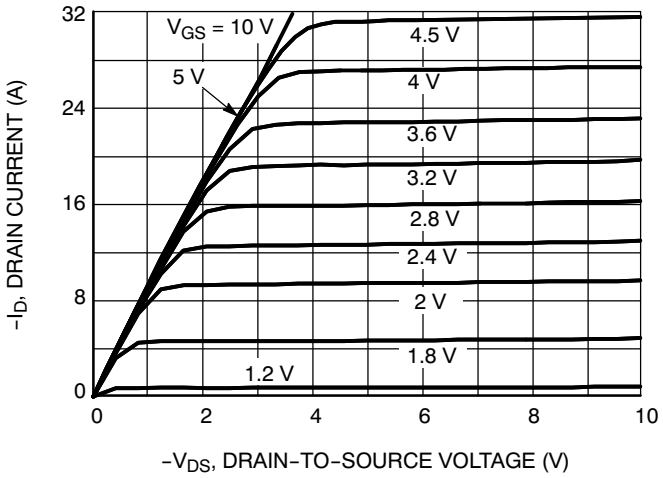


Figure 1. On−Region Characteristics

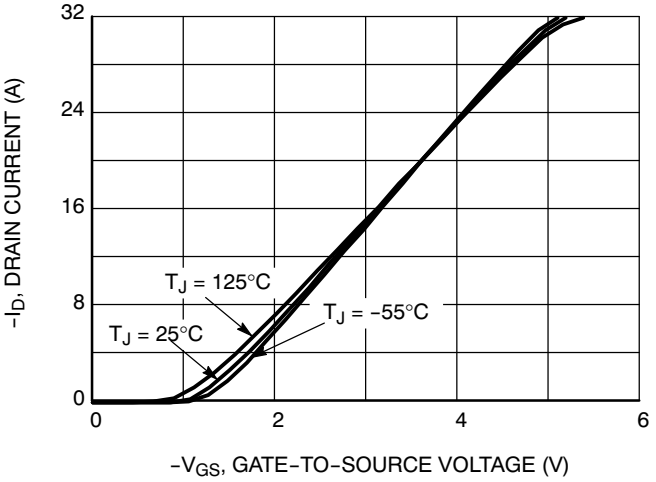


Figure 2. Transfer Characteristics

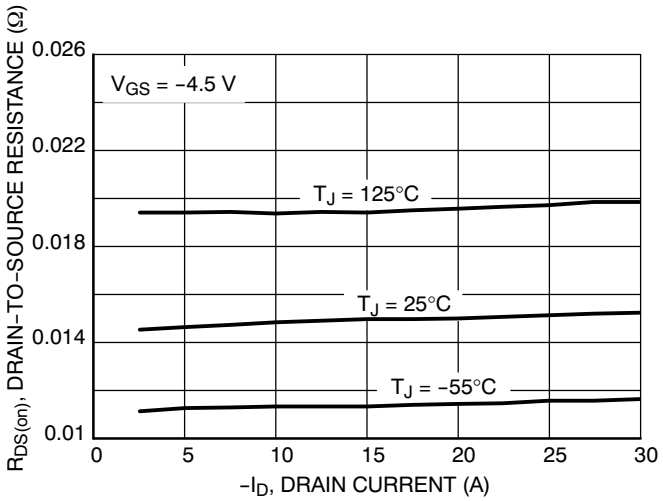


Figure 3. On−Resistance versus Drain Current and Temperature

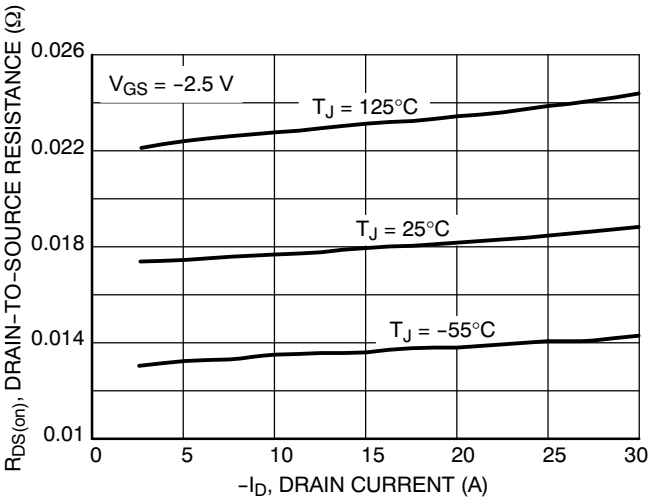


Figure 4. On−Resistance versus Drain Current and Temperature

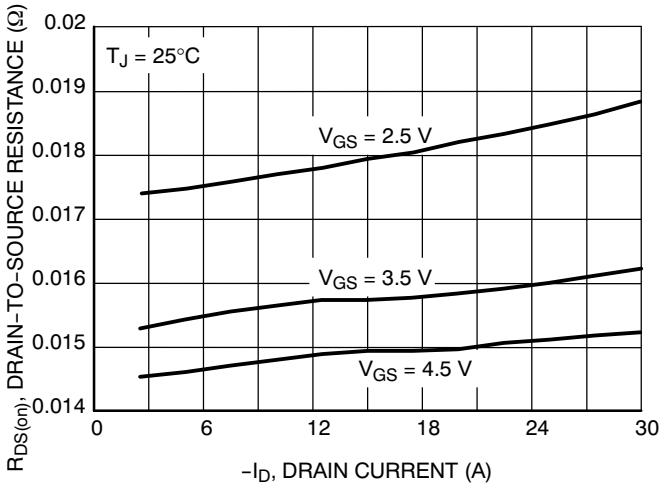


Figure 5. On−Resistance versus Drain Current and Gate Voltage

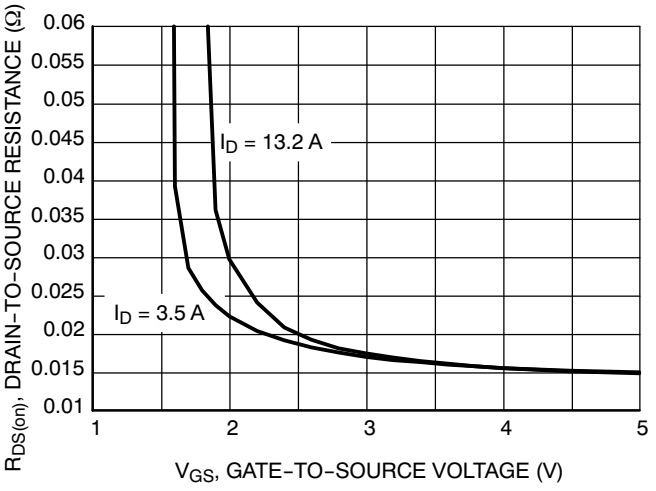


Figure 6. On−Resistance versus Gate Voltage

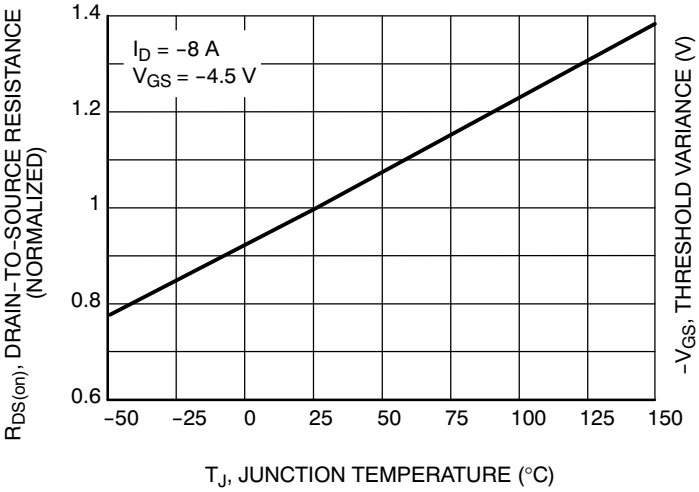


Figure 7. On−Resistance Variation with Temperature

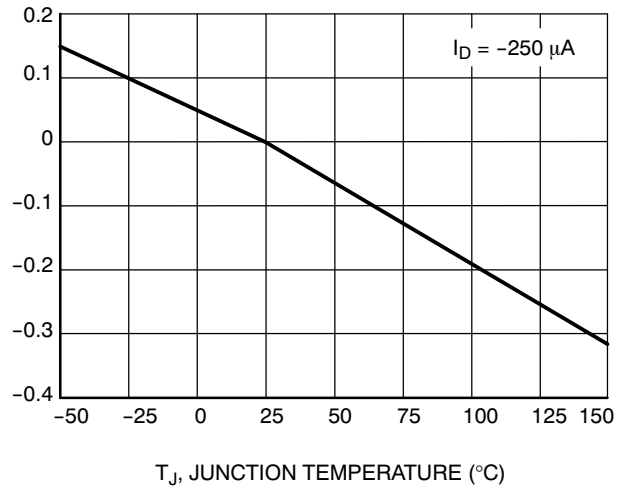


Figure 8. Threshold Voltage

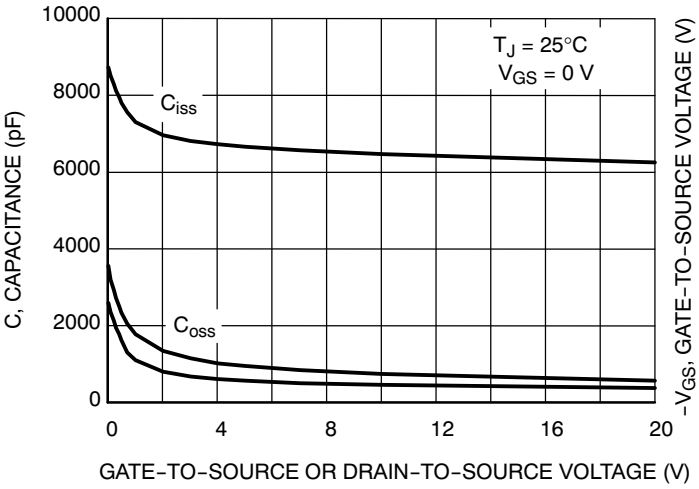


Figure 9. Capacitance Variation

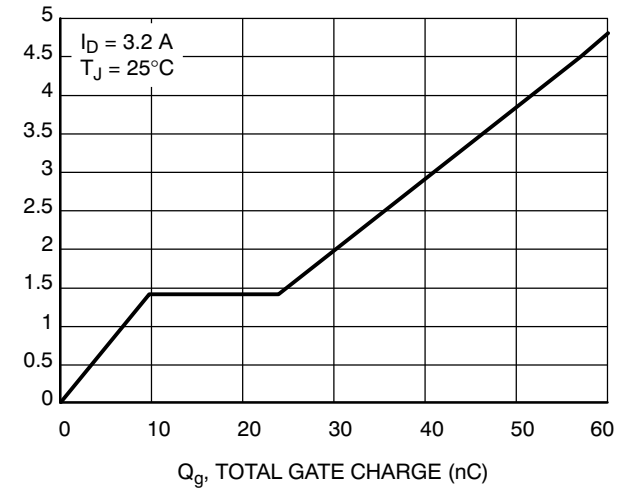


Figure 10. Gate−to−Source and Drain−to−Source Voltage versus Total Charge

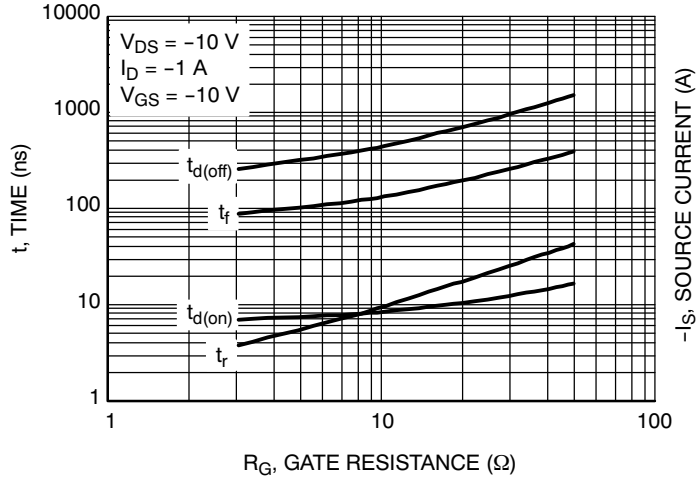


Figure 11. Resistive Switching Time Variation versus Gate Resistance

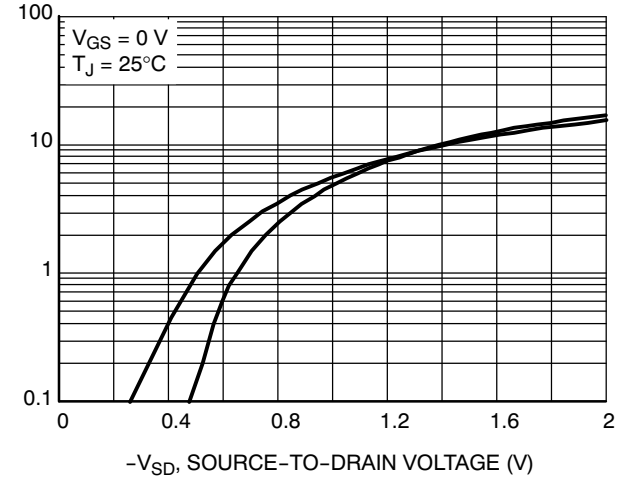
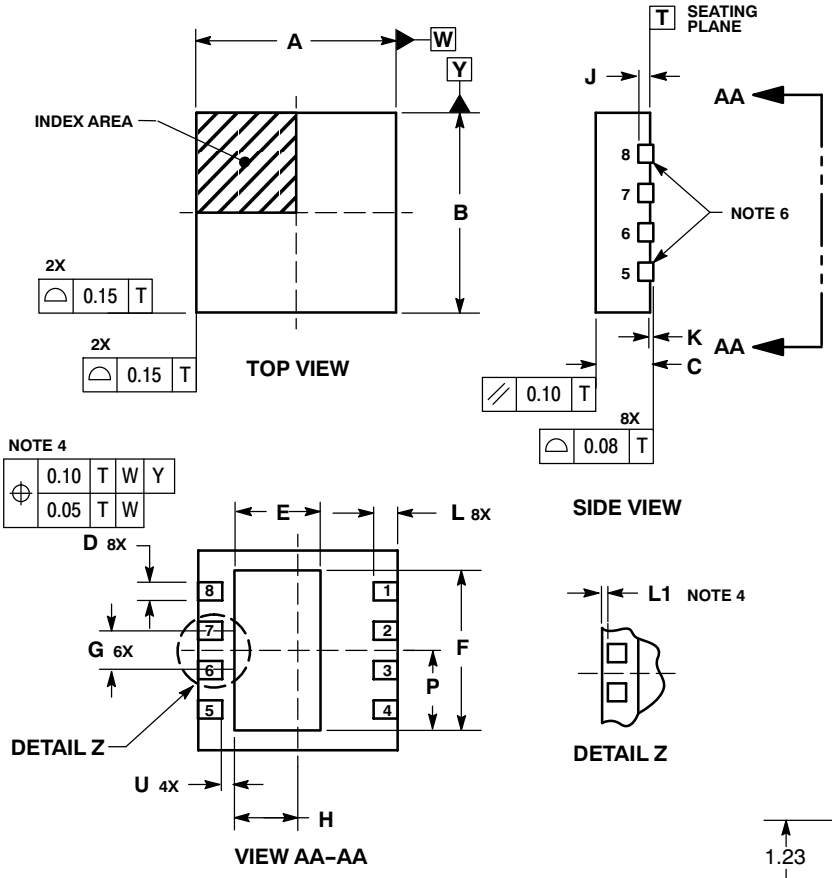


Figure 12. Diode Forward Voltage versus Current

PACKAGE DIMENSIONS

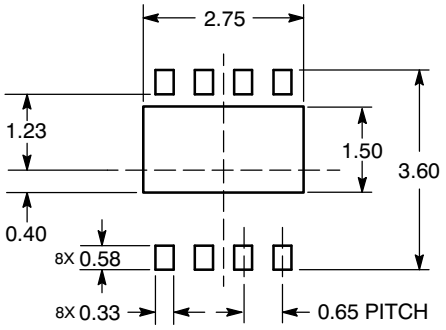
MICRO8 LEADLESS
CASE 846C−01
ISSUE C



NOTES:
1. DIMENSIONS AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETER.
3. THE TERMINAL #1 IDENTIFIER AND TERMINAL NUMBERING CONVENTION SHALL CONFORM TO JESD 95−1 SPP−012. DETAILS OF TERMINAL #1 IDENTIFIER ARE OPTIONAL, BUT MUST BE LOCATED WITHIN THE ZONE INDICATED. THE TERMINAL #1 IDENTIFIER MAY BE EITHER A MOLD OR MARKED FEATURE.
4. DIMENSION D APPLIES TO METALLIZED TERMINAL AND IS MEASURED BETWEEN 0.25 MM AND 0.30 MM FROM TERMINAL TIP. DIMENSION L1 IS THE TERMINAL PULL BACK FROM PACKAGE EDGE, UP TO 0.1 MM IS ACCEPTABLE. L1 IS OPTIONAL.
5. DEPOPULATION IS POSSIBLE IN A SYMMETRICAL FASHION.
6. OPTIONAL SIDE VIEW CAN SHOW LEADS 5 AND 8 REMOVED.

	MILLIMETERS	
DIM	MIN	MAX
A	3.30 BSC	
B	3.30 BSC	
C	0.85	0.95
D	0.25	0.35
E	1.30	1.50
F	2.55	2.75
G	0.65 BSC	
H	0.95	1.15
J	0.25 BSC	
K	0.00	0.05
L	0.35	0.45
L1	0.00	0.10
P	1.28	1.38
U	0.17 TYP	

SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:
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