MOSFET – Power, P-Channel, Schottky Diode, µCool 2x2 mm

-20 V, -4.1 A, 2.0 A

NTLJF3117P

Features

- FETKY™ Configuration with MOSFET plus Low Vf Schottky Diode
- µCOOL™ Package Provides Exposed Drain Pad for Excellent Thermal Conduction
- 2x2 mm Footprint Same as SC-88 Package Design
- Independent Pinout Provides Circuit Design Flexibility
- Low Profile (< 0.8 mm) for Easy Fit in Thin Environment
- High Current Schottky Diode: 2 A Current Rating
- This is a Pb-Free Device

Applications

- Optimized for Portable Applications like Cell Phones, Digital Cameras, Media Players, etc.
- DC-DC Buck Circuit
- Li-Ion Battery Applications
- Color Display and Camera Flash Regulators

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

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	−3.3	A
		T_A = 85 °C		−2.4	
	t ≤ 5 s	T_A = 25 °C		−4.1	
Power Dissipation (Note 1)	Steady State	T_A = 25 °C	P_D	1.5	W
	t ≤ 5 s			2.3	
Continuous Drain Current (Note 2)	Steady State	T_A = 25 °C	I_D	−2.3	A
		T_A = 85 °C		−1.6	
Power Dissipation (Note 2)		T_A = 25 °C	P_D	0.71	W
Pulsed Drain Current	t_p = 10 µs		I_{DM}	−20	A
Operating Junction and Storage Temperature			T_J, T_{STG}	−55 to 150	°C
Source Current (Body Diode) (Note 2)			I_S	−1.9	A
Lead Temperature for Soldering Purposes (1/8″ from case for 10 s)			T_L	260	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

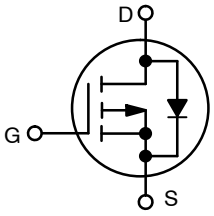
1. Surface Mounted on FR4 Board using 1 in sq pad size (Cu area = 1.127 in sq [1 oz] including traces).
2. Surface Mounted on FR4 Board using the minimum recommended pad size of 30 mm^2, 2 oz Cu.

MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX (Note 1)
−20 V	100 mΩ @ −4.5 V	−4.1 A
	135 mΩ @ −2.5 V	
	200 mΩ @ −1.8 V	

SCHOTTKY DIODE

V_R MAX	V_F TYP	I_F MAX
30 V	0.47 V	2.0 A



P−CHANNEL MOSFET



SCHOTTKY DIODE



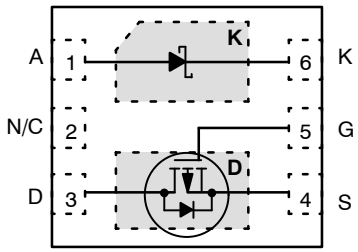
WDFN6
CASE 506AN

MARKING DIAGRAM



JH = Specific Device Code
M = Date Code
▪ = Pb-Free Package
(Note: Microdot may be in either location)

PIN CONNECTIONS



(Top View)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

© Semiconductor Components Industries, LLC, 2006

SCHOTTKY DIODE MAXIMUM RATINGS (T_J = 25 °C unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	30	V
DC Blocking Voltage	V_R	30	V
Average Rectified Forward Current	I_F	2.0	A

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Max	Unit
Junction-to-Ambient-Steady State (Note 3)	$R_{\theta JA}$	83	°C/W
Junction-to-Ambient-t ≤ 5 s (Note 3)	$R_{\theta JA}$	54	
Junction-to-Ambient-Steady State Min Pad (Note 4)	$R_{\theta JA}$	177	

3. Surface Mounted on FR4 Board using 1 in sq pad size (Cu area = 1.127 in sq [2 oz] including traces).
4. Surface Mounted on FR4 Board using the minimum recommended pad size of 30 mm^2, 2 oz Cu.

MOSFET ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

Parameter	Symbol	Test Conditions		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	$V_{(BR)DSS}/T_J$	I_D = −250 μA, Ref to 25 °C			9.95		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = −16 V, V_{GS} = 0 V	T_J = 25 °C			−1.0	μA
			T_J = 85 °C			−10	
Gate-to-Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±8.0 V				±100	nA
ON CHARACTERISTICS (Note 5)							
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = −250 μA		−0.4	−0.7	−1.0	V
Negative Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$				2.44		mV/°C
Drain-to-Source On-Resistance	$R_{DS(on)}$	V_{GS} = −4.5, I_D = −2.0 A			75	100	mΩ
		V_{GS} = −2.5, I_D = −2.0 A			101	135	
		V_{GS} = −1.8, I_D = −1.6 A			150	200	
Forward Transconductance	g_{FS}	V_{DS} = −5.0 V, I_D = −2.0 A			3.1		S
CHARGES, CAPACITANCES AND GATE RESISTANCE							
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = −10 V			531		pF
Output Capacitance	C_{OSS}				91		
Reverse Transfer Capacitance	C_{RSS}				56		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = −4.5 V, V_{DS} = −10 V, I_D = −2.0 A			5.5	6.2	nC
Threshold Gate Charge	$Q_{G(TH)}$				0.7		
Gate-to-Source Charge	Q_{GS}				1.0		
Gate-to-Drain Charge	Q_{GD}				1.4		
Gate Resistance	R_G				8.8		Ω
SWITCHING CHARACTERISTICS (Note 6)							
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} = −4.5 V, V_{DD} = −5.0 V, I_D = −1.0 A, R_G = 6.0 Ω			5.2		ns
Rise Time	t_r				13.2		
Turn-Off Delay Time	$t_{d(OFF)}$				13.7		
Fall Time	t_f				19.1		

5. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
6. Switching characteristics are independent of operating junction temperatures.

Share Feedback
Your Opinion Matters

MOSFET ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
SWITCHING CHARACTERISTICS (Note 6)							
Turn-On Delay Time	$t_{d(ON)}$	V_{GS} = −4.5 V, V_{DD} = −10 V, I_D = −2.0 A, R_G = 2.0 Ω			5.5		ns
Rise Time	t_r				15		
Turn-Off Delay Time	$t_{d(OFF)}$				19.8		
Fall Time	t_f				21.6		
DRAIN-SOURCE DIODE CHARACTERISTICS							
Forward Recovery Voltage	V_{SD}	V_{GS} = 0 V, IS = −1.0 A	T_J = 25 °C		−0.75	−1.0	V
			T_J = 125 °C		−0.64		
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, d_{ISD}/d_t = 100 A/μs, I_S = −1.0 A			16.2		ns
Charge Time	t_a				10.6		
Discharge Time	t_b				5.6		
Reverse Recovery Time	Q_{RR}				5.7		nC

5. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2%.
6. Switching characteristics are independent of operating junction temperatures.

SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS (T_J = 25 °C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Maximum Instantaneous Forward Voltage	V_F	I_F = 0.1 A		0.34	0.39	V
		I_F = 1.0 A		0.47	0.53	
Maximum Instantaneous Reverse Current	I_R	V_R = 30 V		17	20	μA
		V_R = 20 V		3.0	8.0	
		V_R = 10 V		2.0	4.5	

SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS (T_J = 85 °C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Maximum Instantaneous Forward Voltage	V_F	I_F = 0.1 A		0.22	0.35	V
		I_F = 1.0 A		0.40	0.50	
Maximum Instantaneous Reverse Current	I_R	V_R = 30 V		0.22	2.5	mA
		V_R = 20 V		0.11	1.6	
		V_R = 10 V		0.06	1.2	

SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS (T_J = 125 °C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Maximum Instantaneous Forward Voltage	V_F	I_F = 0.1 A		0.2	0.29	V
		I_F = 1.0 A		0.4	0.47	
Maximum Instantaneous Reverse Current	I_R	V_R = 30 V		2.0	20	mA
		V_R = 20 V		1.1	10.9	
		V_R = 10 V		0.63	8.4	

SCHOTTKY DIODE ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Capacitance	C	V_R = 5.0 V, f = 1.0 MHz		38		pF

7. Surface-mounted on FR4 board using 1 in sq pad size (Cu area = 1.127 in sq [2 oz] including traces).
8. Surface-mounted on FR4 board using the minimum recommended pad size of 30 mm^2, 2 oz cu.
9. Pulse Test: pulse width ≤ 300 μs, duty cycle ≤2%.
10. Switching characteristics are independent of operating junction temperatures.

Share Feedback
Your Opinion Matters

TYPICAL PERFORMANCE CURVES (T_J = 25 °C unless otherwise noted)

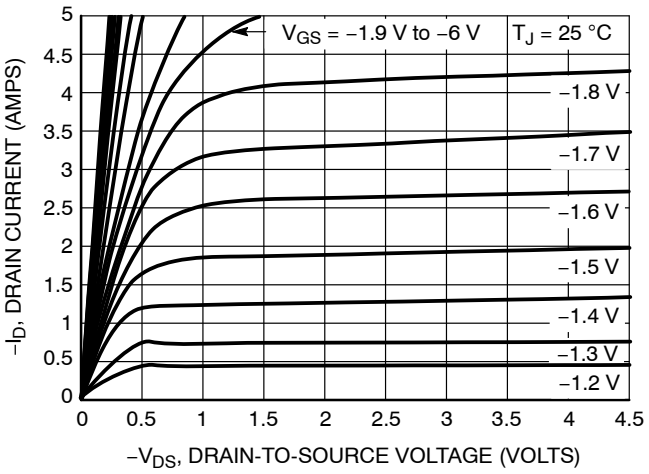


Figure 1. On-Region Characteristics

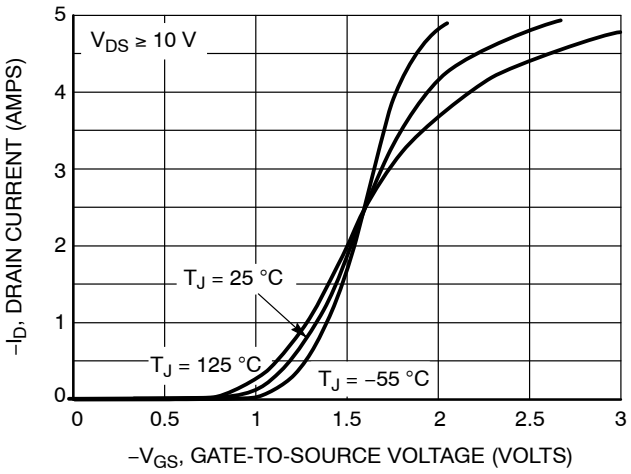


Figure 2. Transfer Characteristics

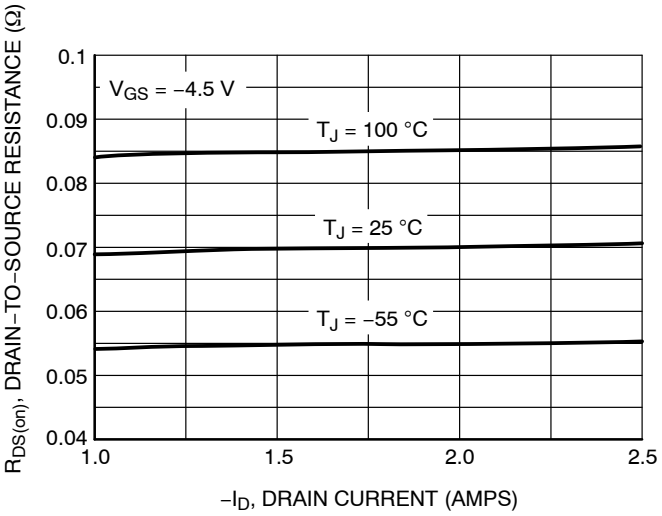


Figure 3. On-Resistance versus Drain Current

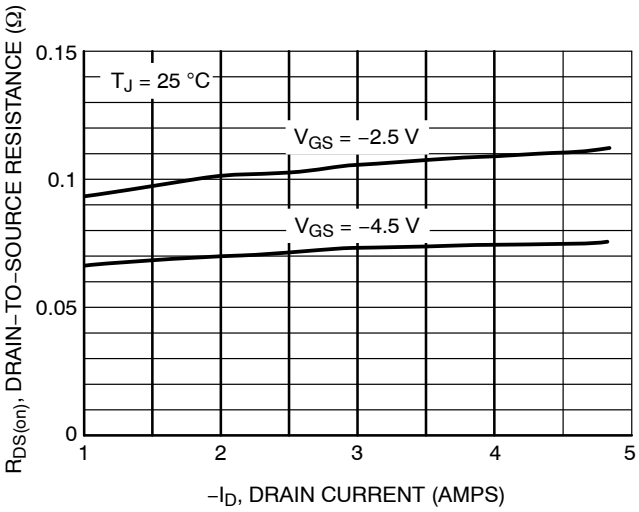


Figure 4. On-Resistance versus Drain Current and Gate Voltage

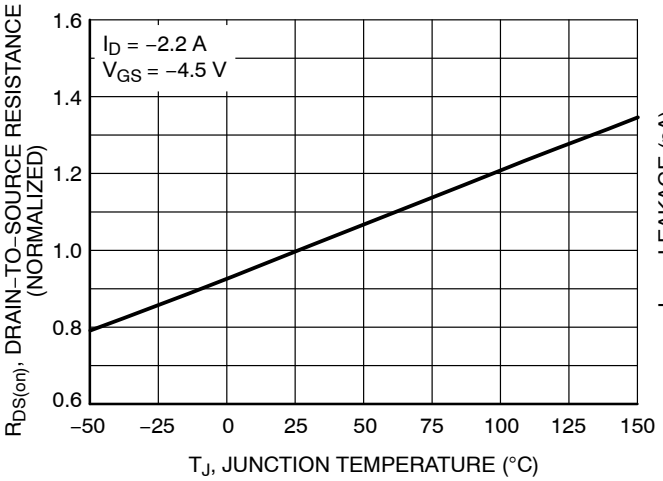


Figure 5. On-Resistance Variation with Temperature

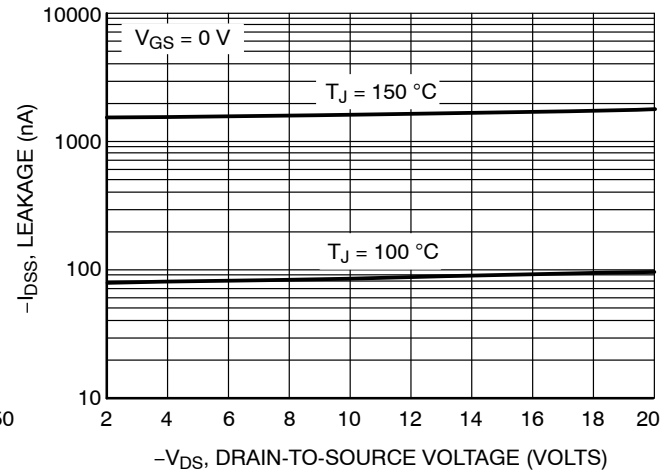


Figure 6. Drain-to-Source Leakage Current versus Voltage

Share Feedback
Your Opinion Matters

TYPICAL PERFORMANCE CURVES (T_J = 25 °C unless otherwise noted)

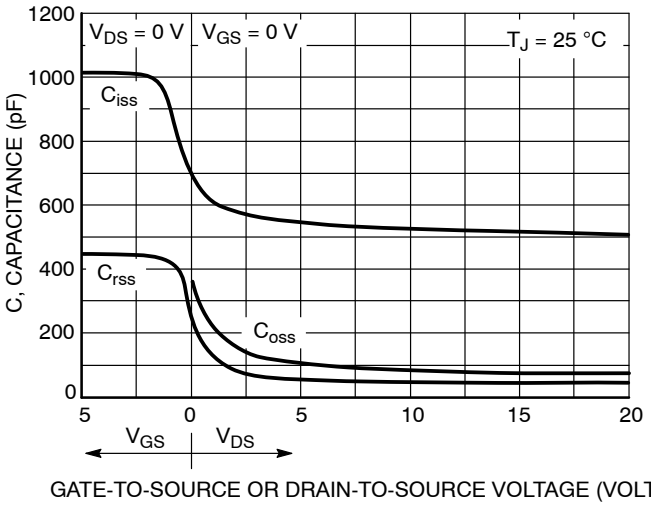


Figure 7. Capacitance Variation

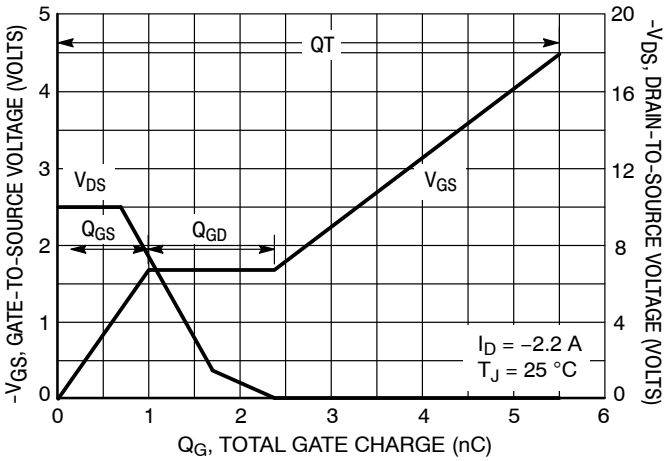


Figure 8. Gate-To-Source and Drain-To-Source Voltage versus Total Charge

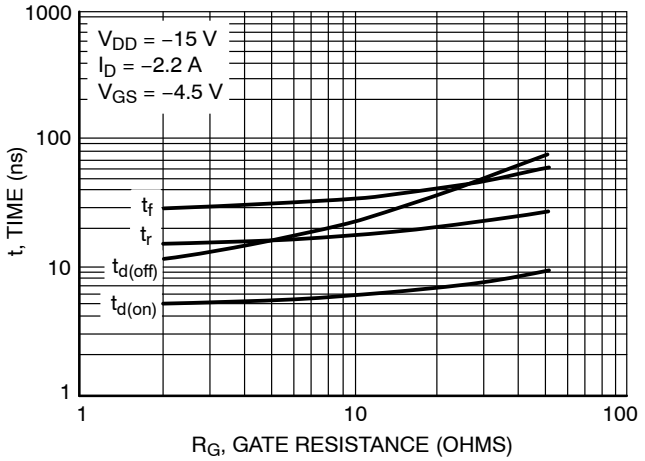


Figure 9. Resistive Switching Time Variation versus Gate Resistance

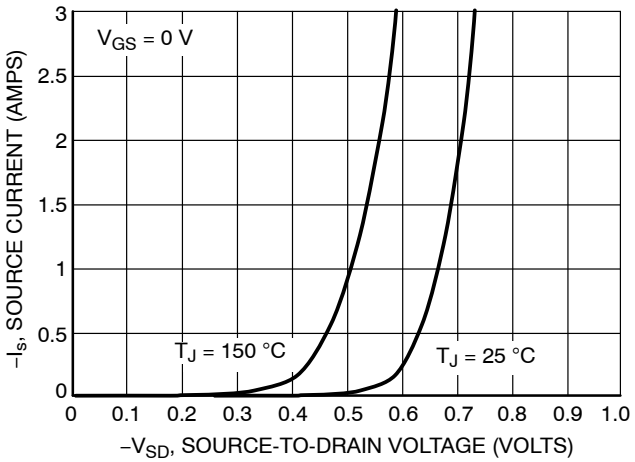


Figure 10. Diode Forward Voltage versus Current

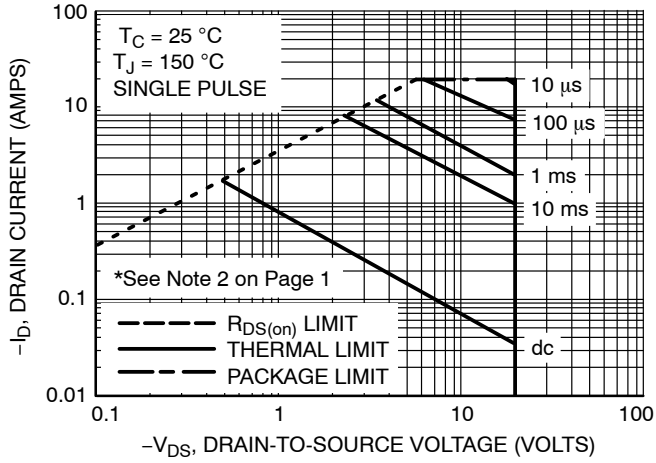


Figure 11. Maximum Rated Forward Biased Safe Operating Area

Share Feedback
Your Opinion Matters

TYPICAL PERFORMANCE CURVES (T_J = 25 °C unless otherwise noted)

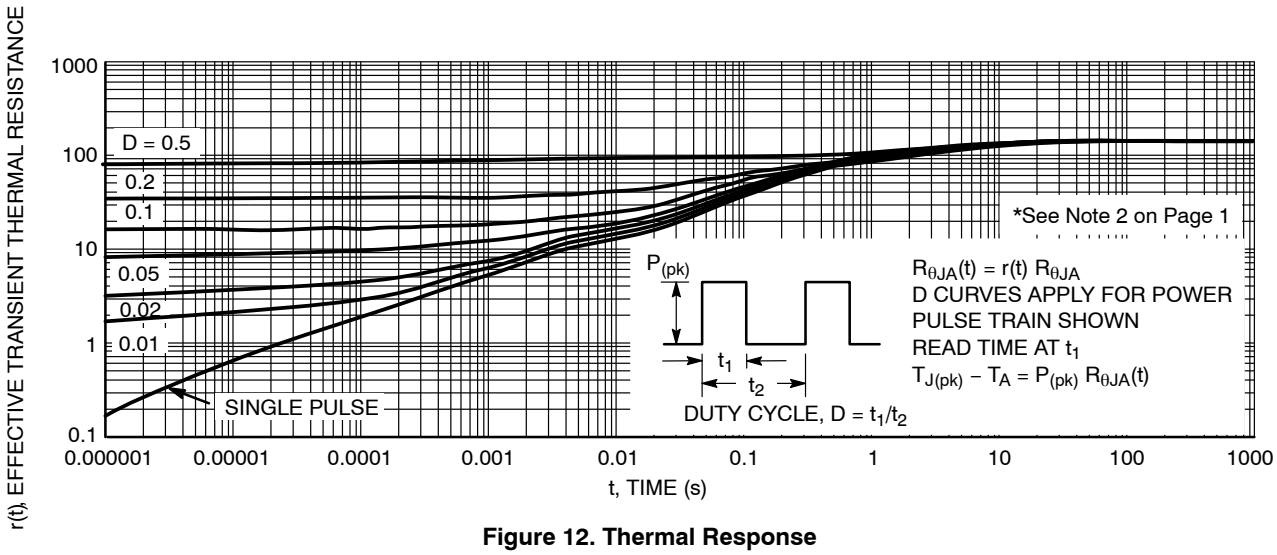


Figure 12. Thermal Response

Share Feedback
Your Opinion Matters

TYPICAL SCHOTTKY PERFORMANCE CURVES (T_J = 25 °C unless otherwise noted)

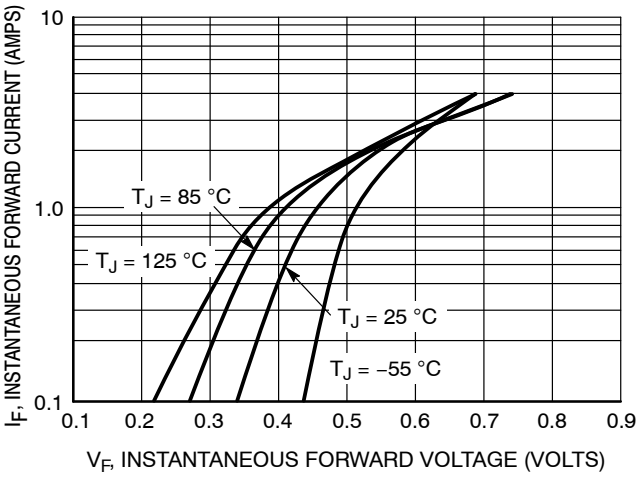


Figure 13. Typical Forward Voltage

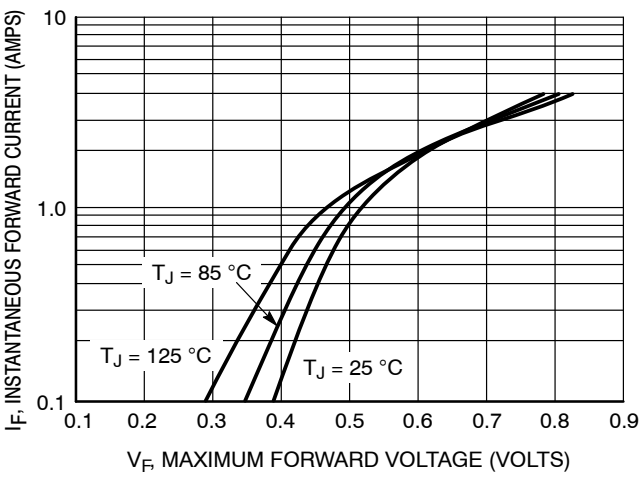


Figure 14. Maximum Forward Voltage

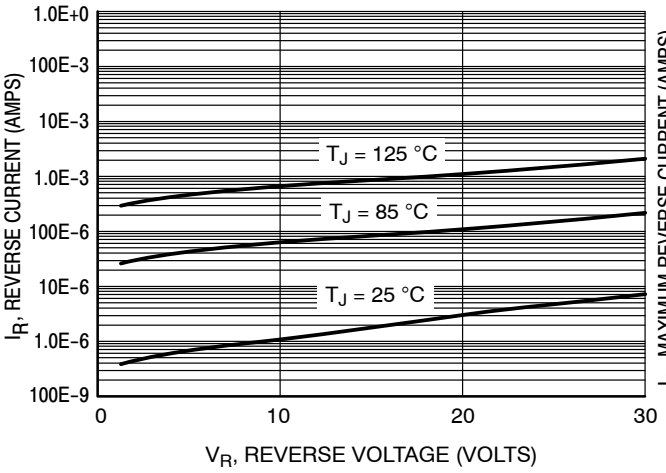


Figure 15. Typical Reverse Current

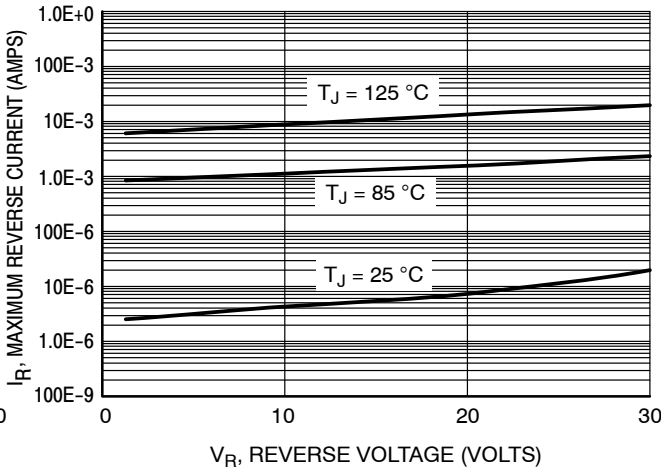


Figure 16. Maximum Reverse Current

ORDERING INFORMATION

Device	Package	Shipping†
NTLJF3117PT1G	WDFN6 (Pb-Free)	3000 / Tape & Reel

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

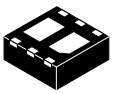
Share Feedback
Your Opinion Matters

REVISION HISTORY

Revision	Description of Changes	Date
4	Rebranded the Data Sheet to **onsemi** format	2/9/2026

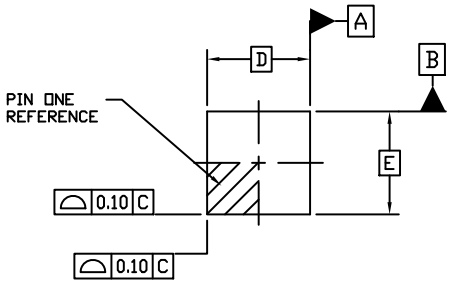
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

Share Feedback
Your Opinion Matters



WDFN6 2x2, 0.65P
CASE 506AN
ISSUE H

DATE 25 JAN 2022



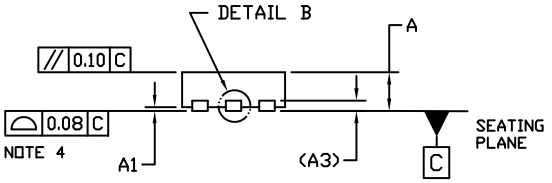
TOP VIEW



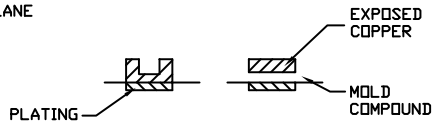
DETAIL A
OPTIONAL CONSTRUCTIONS

NOTES:

1. DIMENSIONING AND TOLERANCING PER. ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS
3. DIMENSION b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM THE TERMINAL TIP.
4. COPLANARITY APPLIES TO THE EXPOSED PADS AS WELL AS THE TERMINALS.

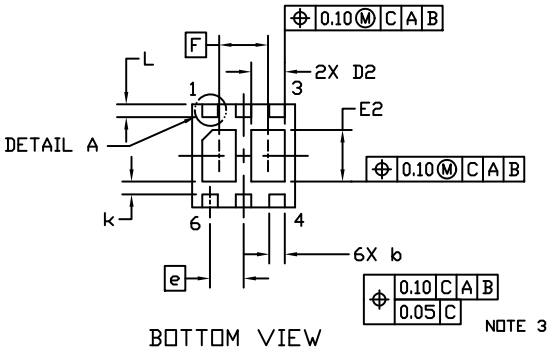


SIDE VIEW

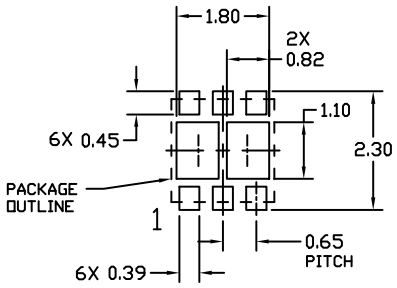


DETAIL B
OPTIONAL CONSTRUCTIONS

DIM	MILLIMETERS	
	MIN.	MAX.
A	0.70	0.80
A1	0.00	0.05
A3	0.20 REF	
b	0.25	0.35
D	2.00 BSC	
D2	0.57	0.77
E	2.00 BSC	
E2	0.90	1.10
e	0.65 BSC	
F	0.95 BSC	
k	0.25 REF	
L	0.20	0.30
L1	---	0.10



BOTTOM VIEW



RECOMMENDED
MOUNTING FOOTPRINT
SOLDERMASK DEFINED

GENERIC
MARKING DIAGRAM*



XX = Specific Device Code
M = Date Code

*This information is generic. Please refer to device data sheet for actual part marking. Pb−Free indicator, “G” or microdot “▪”, may or may not be present. Some products may not follow the Generic Marking.

DOCUMENT NUMBER:	**98AON20861D**	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red.
DESCRIPTION:	**WDFN6 2x2, 0.65P**	**PAGE 1 OF 1**

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. **onsemi** does not convey any license under its patent rights nor the rights of others.

onsemi, , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent−Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as−is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:
Technical Library: www.onsemi.com/design/resources/technical−documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support
For additional information, please contact your local Sales Representative at www.onsemi.com/support/sales

ENTEGRECİ

Bu belge www.entegreci.com üzerinden sunulmaktadır.

Elektronik komponent tedarikinde Entegreci

Entegreci, Eskişehir merkezli, Türkiye geneline satış yapan bir elektronik komponent mağazasıdır. Entegreler (IC), mikrodenetleyiciler, transistörler, diyotlar, pasif elemanlar, konnektörler, modüller ve geliştirme kartları tek adetten seri üretim adetlerine kadar satılır. Ürün sayfalarında güncel stok durumunu, fiyatı ve datasheet bağlantısını bulabilirsiniz.

Parça koduyla arama

Üretici parça numarasını yazın; stok ve fiyatı hemen görün.

www.entegreci.com

Ürün kategorileri

Entegreden kapasitöre tüm elektronik komponent kategorileri.

Kategorilere göz atın

Üreticiler

Aradığınız üreticinin ürünlerini tek sayfada inceleyin.

Üreticileri görün

Toplu alım ve teklif

Listede olmayan ya da yüksek adetli parçalar için teklif isteyin.

Teklif isteyin

www.entegreci.com | **destek@entegreci.com** | **0850 305 90 34**

Entegreci is an online electronic components store based in Türkiye. Search by manufacturer part number to see stock, prices and datasheets for integrated circuits, microcontrollers, transistors, passive components and connectors, or request a quote for parts that are not listed.

Bu sayfa Entegreci tarafından eklenmiştir. Belgenin önceki sayfaları asıl yayıncısına aittir ve içeriği değiştirilmemiştir; en güncel sürüm için belgenin yayıncısına başvurun.