

Description

The WSD1614DN106 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a Battery protection or in other Switching application.

Features

High power and current handing capability

Lead free product is acquired

Surface mount package

ESD:1.5KV

Product Summary

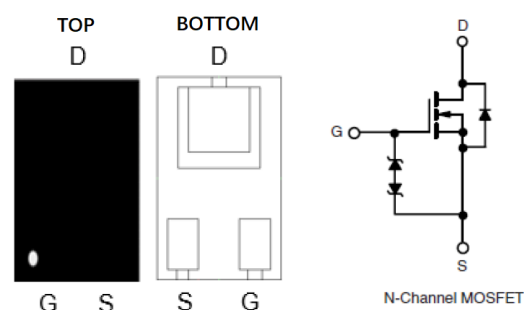
BV_{DSS}	$R_{DS(ON)}$	I_D
20V	230m Ω	1.4A

Application

Battery protection

Load switch

DFN1X06-3S Pin Configuration



Absolute Maximum Ratings ($T_A=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit	
V_{DS}	Drain-Source Voltage	20	V	
V_{GS}	Gate-Source Voltage	± 8	V	
I_D	Drain Current (Continuous) *AC	$T_A=25^\circ\text{C}$	1.4	A
		$T_A=70^\circ\text{C}$	1.1	A
I_{DM}	Drain Current (Pulse) *B	3	A	
P_D	Power Dissipation	$T_C=25^\circ\text{C}$	0.55	W
T_J/T_{STG}	Operating Temperature/ Storage Temperature	-55~150	$^\circ\text{C}$	

Thermal Resistance Ratings

Symbol	Parameter	Max	Unit	
R_{thJA}	Maximum Junction-to-Ambient	Steady-State	180	$^\circ\text{C}/\text{W}$

Electrical Characteristics ($T_A=25^{\circ}\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	20	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 16V, V_{GS} = 0V$	--	--	1	μA
$V_{GS(TH)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_{DS} = 250\mu A$	0.4	0.65	1	V
I_{GSS}	Gate Leakage Current	$V_{GS} = 8V, V_{DS} = 0V$	--	--	10	μA
$R_{DS(on)}$	Drain-Source On-state Resistance	$V_{GS} = 4.5V, I_D = 0.55A$	--	180	230	m Ω
		$V_{GS} = 2.5V, I_D = 0.45A$	--	235	305	m Ω
		$V_{GS} = 1.8V, I_D = 0.35A$	--	320	455	m Ω
V_{SD}	Diode Forward Voltage	$I_{SD} = 0.35A, V_{GS} = 0V$	--	--	1.2	V
I_S	Diode Forward Current *AC	$T_A = 25^{\circ}\text{C}$	--	--	0.58	A
Q_g	Total Gate Charge	$V_{GS} = 4.5V,$ $V_{DS} = 10V,$ $I_D = 1A$	--	2	--	nC
Q_{gs}	Gate-Source Charge		--	0.3	--	nC
Q_{gd}	Gate-Drain Charge		--	0.3	--	nC
$t_{d(on)}$	Turn-on Delay Time	$V_{GS} = 4.5V,$ $V_{DS} = 10V,$ $R_{\theta} = 6, I_D = 2A$	--	1.2	--	ns
t_r	Turn-on Rise Time		--	25	--	ns
$t_{d(off)}$	Turn-off Delay Time		--	14	--	ns
t_f	Turn-Off Fall Time		--	15	--	ns
C_{iss}	Input Capacitance	$V_{DS} = 10V,$ $V_{GS} = 0V,$ $f = 1.0\text{MHz}$	--	43	--	pF
C_{oss}	Output Capacitance		--	9	--	pF
C_{rss}	Reverse Transfer Capacitance		--	6	--	pF

Note:

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.

B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the $\leq 10\text{s}$ junction to ambient thermal resistance rating.

Typical Performance Characteristics ((T_J = 25 °C, unless otherwise noted))

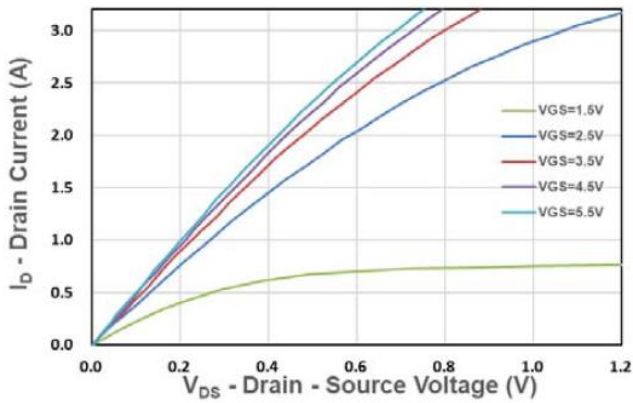


Figure 1. Output Characteristics

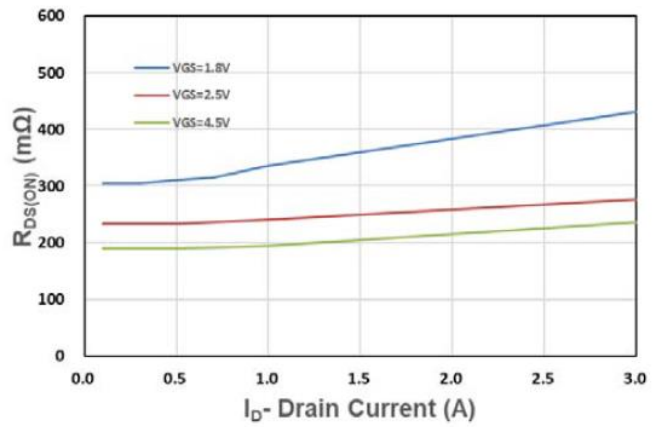


Figure 2. On-Resistance vs. I

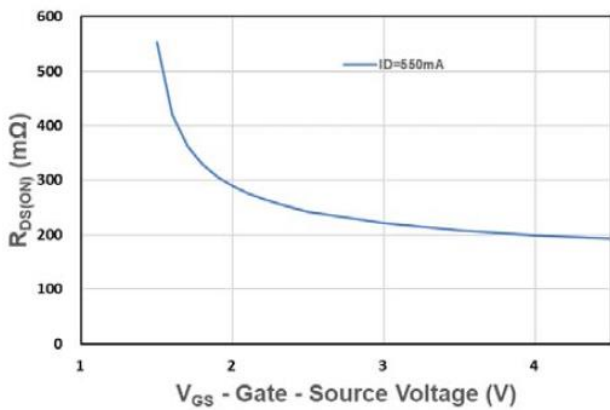


Figure 3. On-Resistance vs. V_{GS}

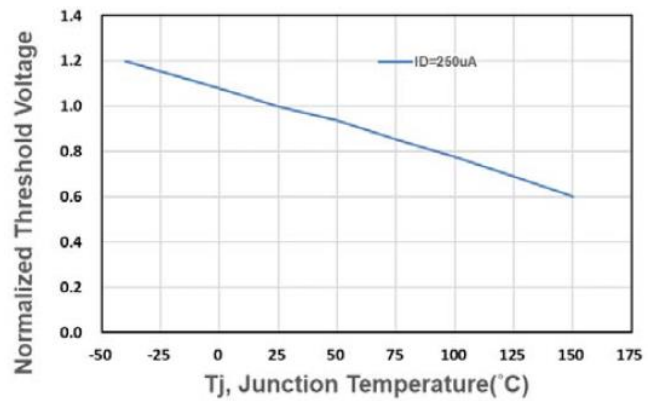


Figure 4. Gate Threshold Voltage

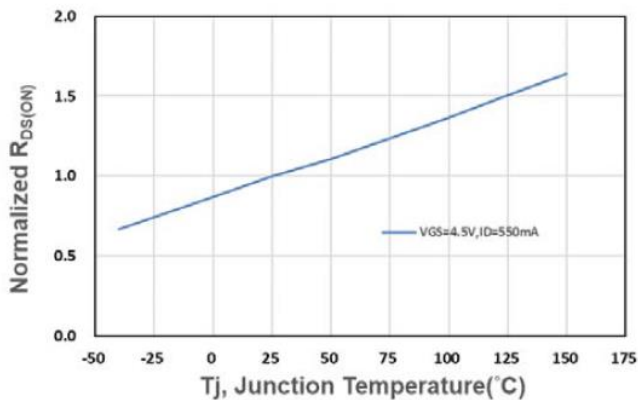


Figure 5. Drain-Source On Resistance

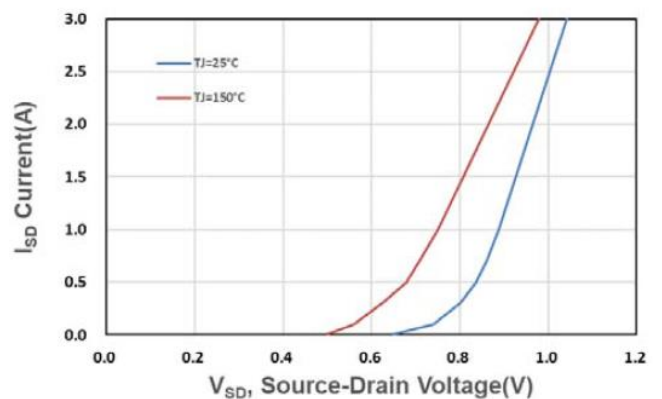


Figure 6. Source-Drain Diode Forward

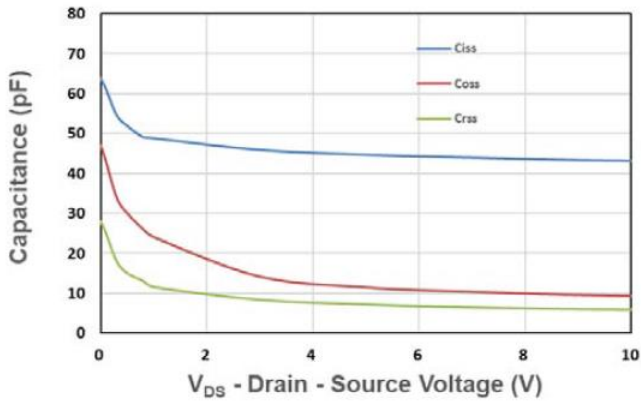


Figure 7. Capacitance

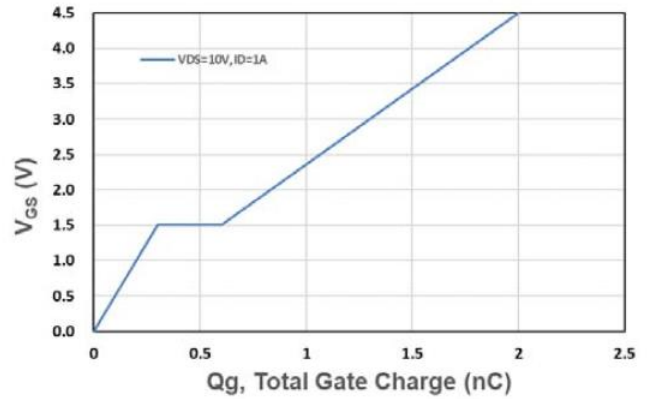


Figure 8. Gate Charge Characteristics

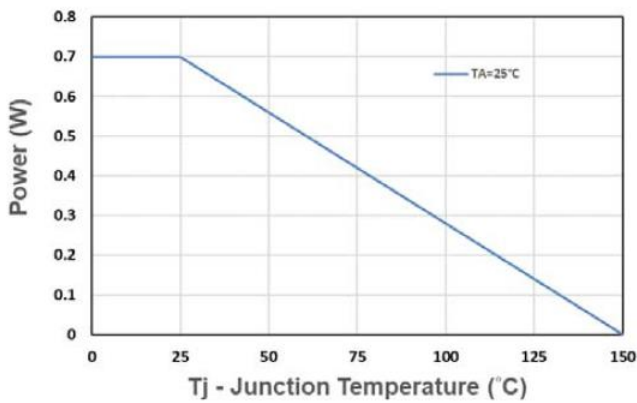


Figure 9. Power Dissipation

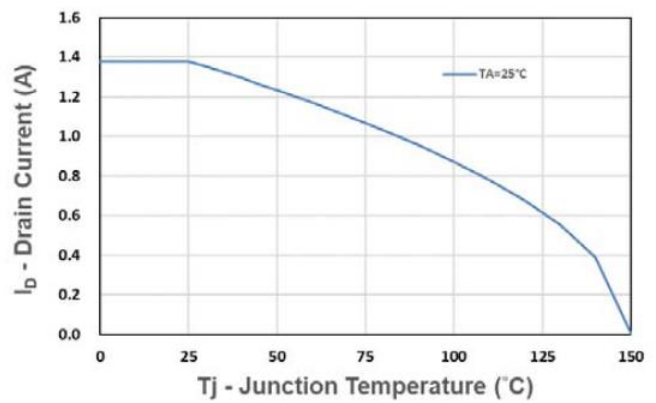


Figure 10. Drain Current

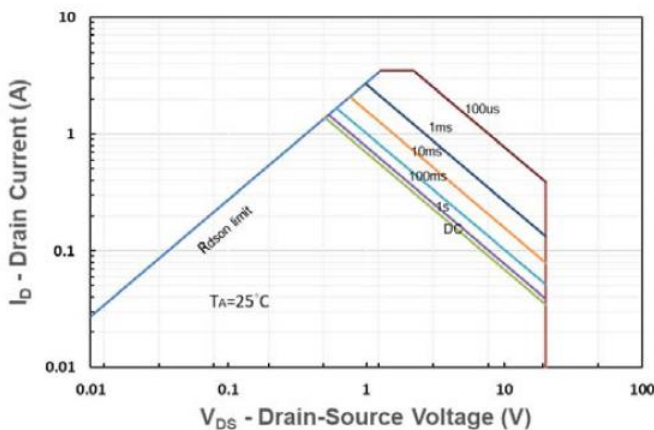


Figure 11. Safe Operating Area

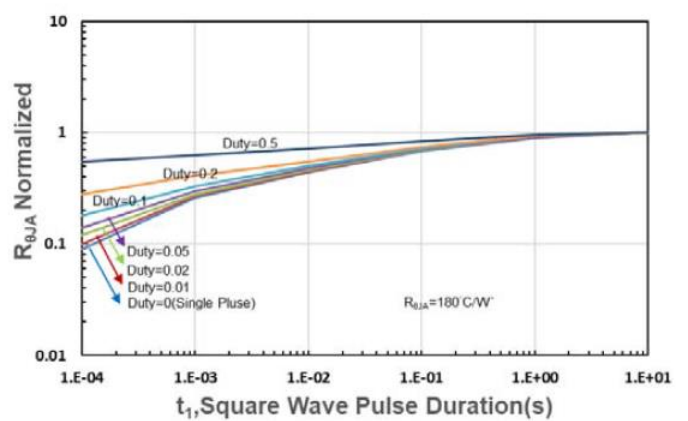
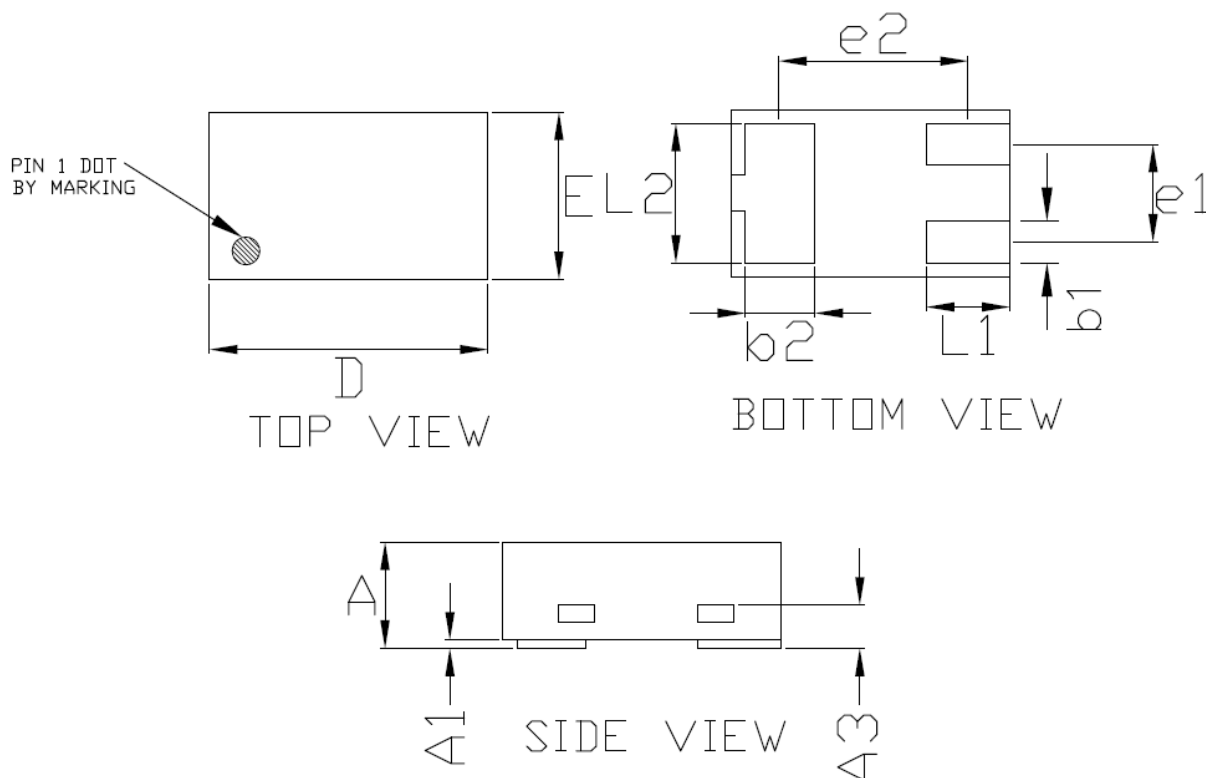


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance

Package Information

DFN1X06-3S



COMMON DIMENSIONS(MM)			
PKG.	X1:EXTREME THIN		
REF.	MIN.	NOM.	MAX
A	>0.40	-	0.50
A1	0.00	-	0.05
A3	0.125 REF.		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.10	0.15	0.20
b2	0.20	0.25	0.30
L1	0.20	0.30	0.40
L2	0.40	0.50	0.60
e1	0.35 BSC		
e2	0.675 BSC		

Attention

- 1, Any and all Winsok power products described or contained herein do not have specifications that can handle applications that require extremely high levels of reliability, such as life-support systems, aircraft's control systems, or other applications whose failure can be reasonably expected to result in serious physical and/or material damage. Consult with your Winsok power representative nearest you before using any Winsok power products described or contained herein in such applications.
- 2, Winsok power assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all Winsok power products described or contained herein.
- 3, Specifications of any and all Winsok power products described or contained herein stipulate the performance, characteristics, and functions of the described products in the independent state, and are not guarantees of the performance, characteristics, and functions of the described products as mounted in the customer's products or equipment. To verify symptoms and states that cannot be evaluated in an independent device, the customer should always evaluate and test devices mounted in the customer's products or equipment.
- 4, Winsok power Semiconductor CO., LTD. strives to supply high-quality high-reliability products. However, any and all semiconductor products fail with some probability. It is possible that these probabilistic failures could give rise to accidents or events that could endanger human lives that could give rise to smoke or fire, or that could cause damage to other property. When designing equipment, adopt safety measures so that these kinds of accidents or events cannot occur. Such measures include but are not limited to protective circuits and error prevention circuits for safe design, redundant design, and structural design.
- 5, In the event that any or all Winsok power products (including technical data, services) described or contained herein are controlled under any of applicable local export control laws and regulations, such products must not be exported without obtaining the export license from the authorities concerned in accordance with the above law.
- 6, No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or any information storage or retrieval system, or otherwise, without the prior written permission of Winsok power Semiconductor CO., LTD.
- 7, Information (including circuit diagrams and circuit parameters) herein is for example only; it is not guaranteed for volume production. Winsok power believes information herein is accurate and reliable, but no guarantees are made or implied regarding its use or any infringements of intellectual property rights or other rights of third parties.
- 8, Any and all information described or contained herein are subject to change without notice due to product/technology improvement, etc. When designing equipment, refer to the "Delivery Specification" for the Winsok power product that you intend to use.
- 9, this catalog provides information as of Sep. 2014. Specifications and information herein are subject to change without notice.