WSD3084DN33

N-Channel MOSFET

General Description

The WSD3084DN33 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

The WSD3084DN33 meet the RoHS and Green Product requirement, 100% E_{AS} guaranteed with full function reliability approved.

Product Summery

BV_{DSS}	$R_{DS(ON)}$	I_D
30V	3.3mΩ	84A

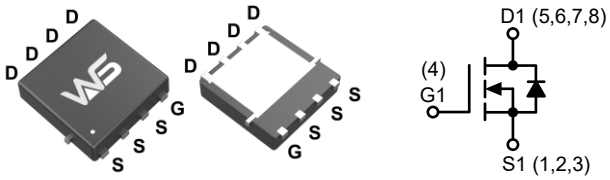
Applications

- Battery protection
- Load switch
- Uninterruptible power supply

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% E_{AS} Guaranteed
- Green Device Available

DFN3X3-8L Pin Configuration



Absolute Maximum Ratings (T_C=25°C, Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	±20	
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V [1]	84	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V [1]	51	
I_{DM}	Pulsed Drain Current [2]	360	
E_{AS}	Single Pulse Avalanche Energy [3]	144.7	mJ
I_{AS}	Avalanche Current	53.8	A
P_D@T_C=25°C	Total Power Dissipation [4]	43.4	W
P_D@T_C=25°C	Total Power Dissipation [4]	1.67	
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	

Thermal Data

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient [1]	---	85	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case [1]	---	2.3	

Electrical Characteristics (T_J=25°C, Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250μA	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance [2]	V_{GS}=10V , I_D=30A	---	3.3	4.0	mΩ
		V_{GS}=4.5V , I_D=20A	---	4.3	6.0	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D=250μA	1.0	1.5	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=30V , V_{GS}=0V	---	---	1.0	μA
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
Q_g	Total Gate Charge	V_{DS}=15V , V_{GS}=10V , I_D=30A	---	30	---	nC
Q_{gs}	Gate-Source Charge		---	7.2	---	
Q_{gd}	Gate-Drain Charge		---	10.4	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3Ω , I_D=30A	---	23	---	ns
T_r	Rise Time		---	28	---	
$T_{d(off)}$	Turn-Off Delay Time		---	74	---	
T_f	Fall Time		---	36	---	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f = 1.0MHz	---	2680	---	pF
C_{oss}	Output Capacitance		---	393	---	
C_{rss}	Reverse Transfer Capacitance		---	330	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
I_S	Continuous Source Current [1,6]	V_G=V_D=0V , Force Current	---	---	120	A
I_{SM}	Pulsed Source Curren [2,6]		---	---	400	
V_{SD}	Diode Forward Voltage [2]	V_{GS}=0V , I_S=30A	---	---	1.2	V
t_{rr}	Reverse Recovery Time	I_F=20A, dI/dt=100A/μs	---	28	---	ns
Q_{rr}	Reverse Recovery Charge		---	21	---	nC

Note:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. The data tested by pulsed , pulse width ≤ 300μs , duty cycle ≤ 2%
3. The E_{AS} data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=53.8A
4. The power dissipation is limited by 150°C junction temperature.
5. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

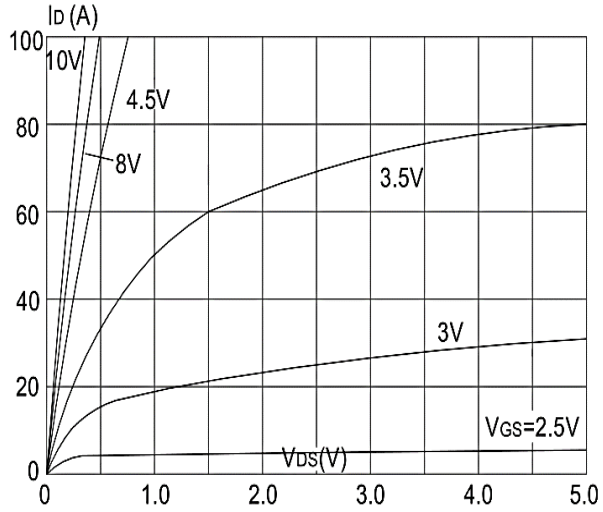


Figure1: Output Characteristics

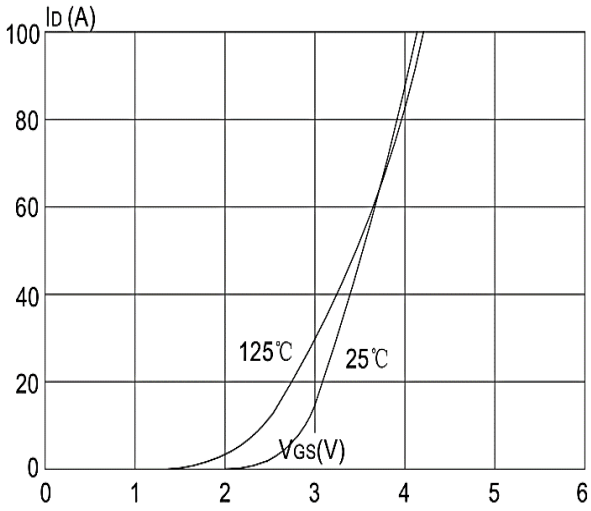


Figure 2: Typical Transfer Characteristics

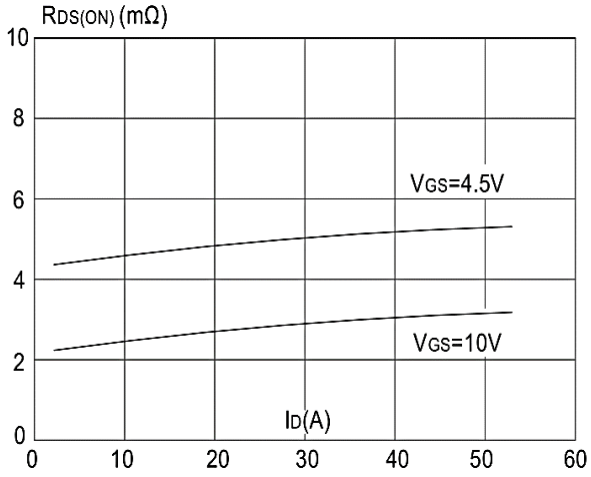


Figure 3:On-resistance vs. Drain Current

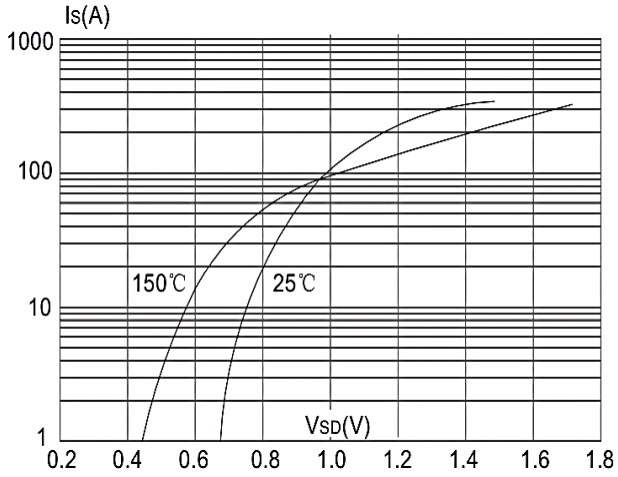


Figure 4: Body Diode Characteristics

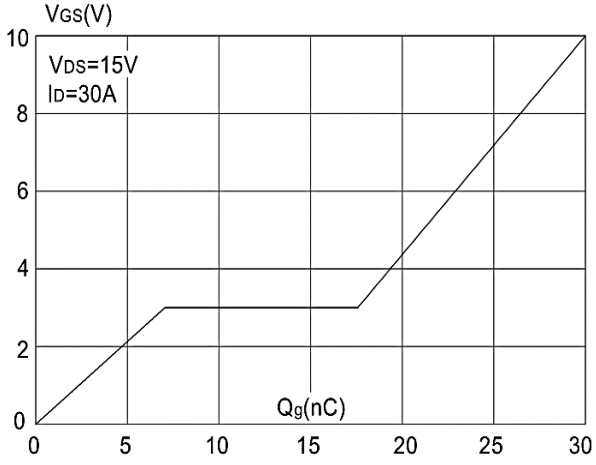


Figure 5: Gate Charge Characteristics

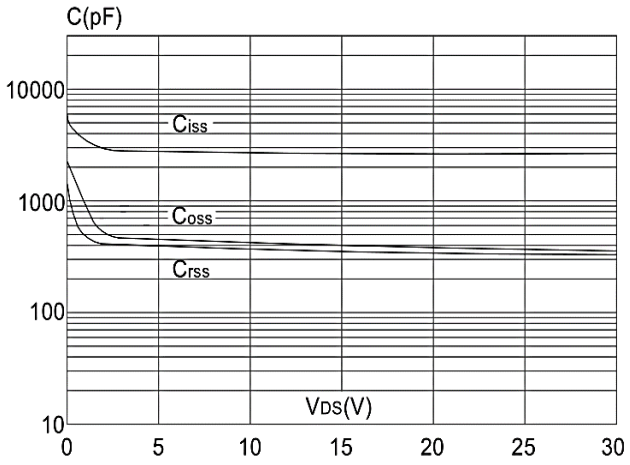


Figure 6: Capacitance Characteristics

Typical Characteristics (Cont.)

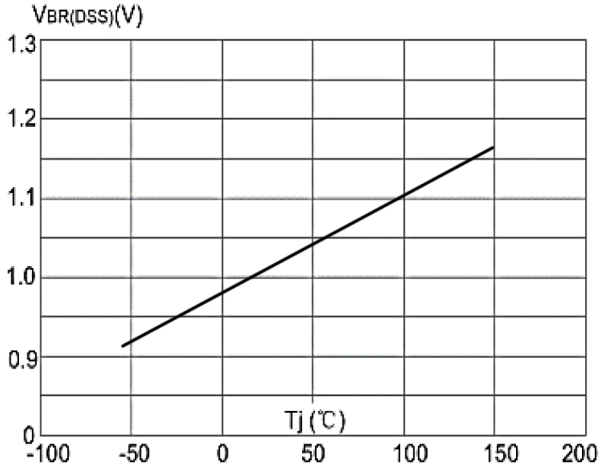


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

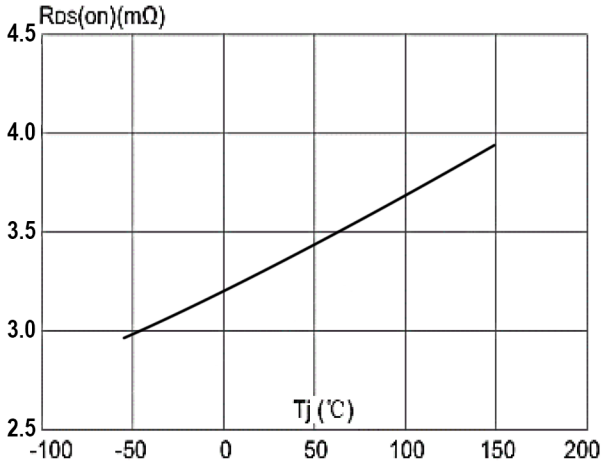


Figure 8: Normalized on Resistance vs Junction Temperature

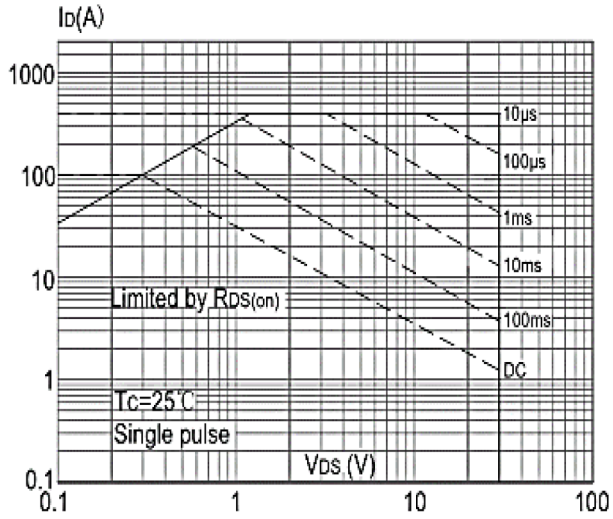


Figure 9: Maximum Safe Operating Area vs. Case Temperature

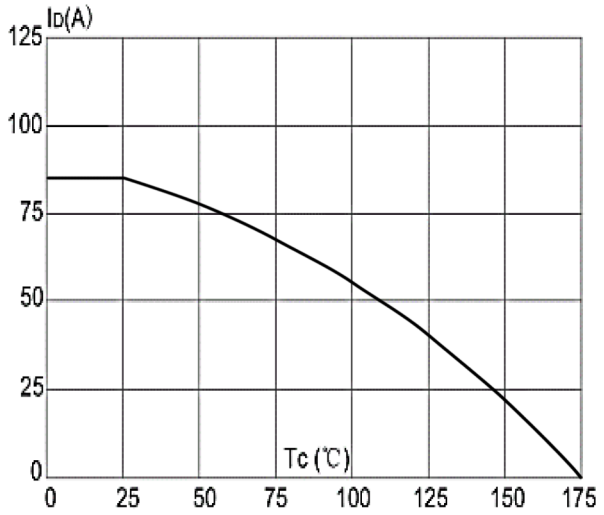


Figure 10: Maximum Continuous Drain Current

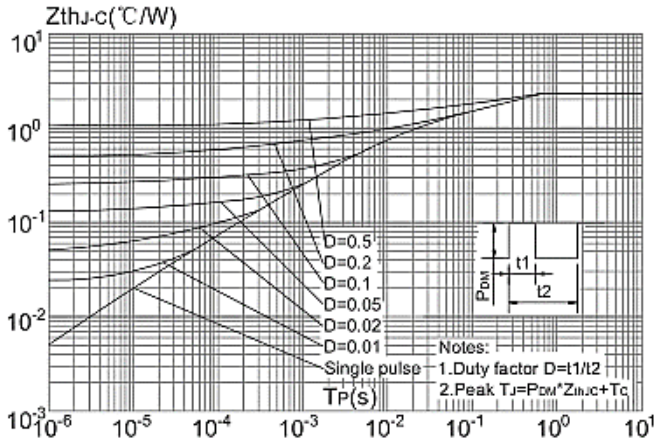
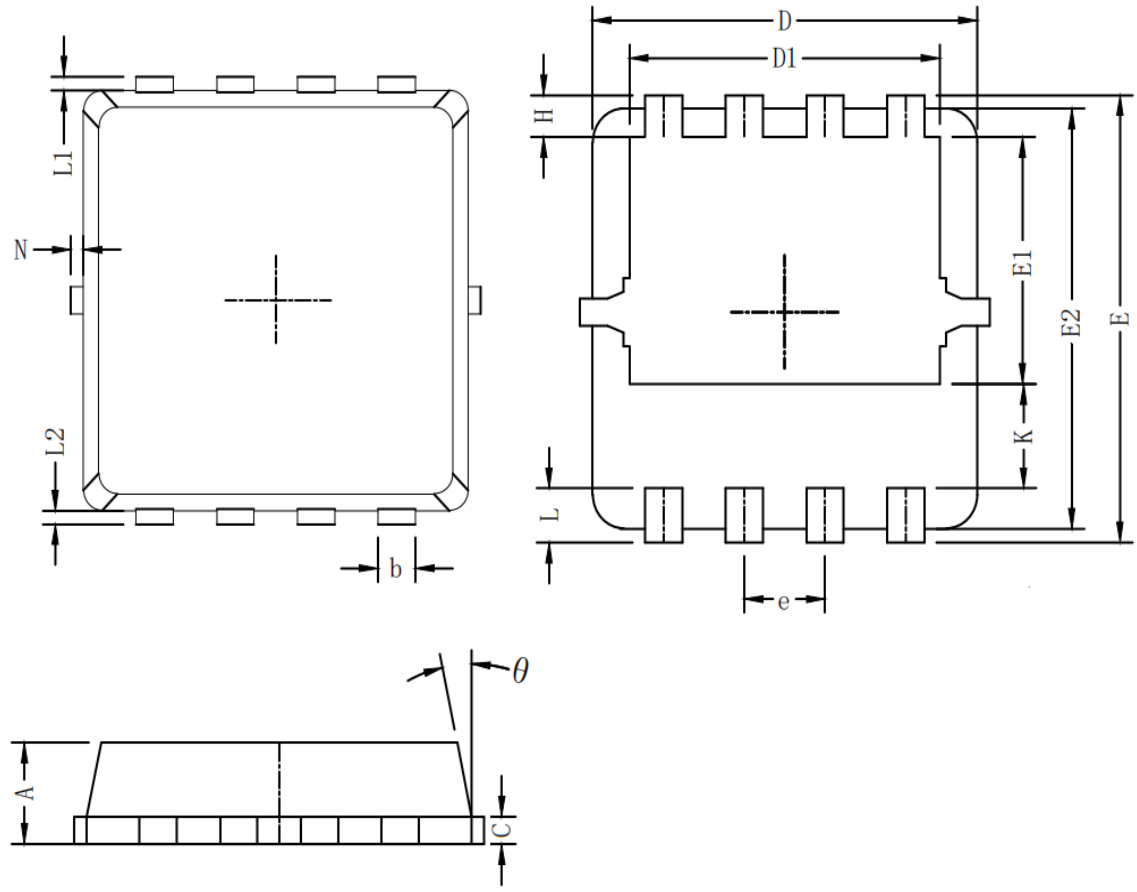


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Packaging information



Symbol	Dim in mm		
	min	typ	max
A	0.6	0.75	0.9
b	0.2	0.3	0.4
C	0.15	0.2	0.25
D	3	3.1	3.2
D1	2.3	2.45	2.6
E	3.15	3.3	3.45
E1	1.43	1.73	1.93
E2	2.9	3.05	3.2
e	0.65BSC		
H	0.2	0.35	0.5
K	0.57	0.77	0.87
L	0.3	0.4	0.5
L1/L2	0.1REF		
θ	8°	10°	13°
N	0		0.15

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