

### General Description

The WSD2073DN33 is the highest performance trench Dual P-Channel MOSFETs with extreme high cell density, which provide excellent  $R_{DS(ON)}$  and gate charge for most of the synchronous buck converter applications.

The WSD2073DN33 meet the RoHS and Green Product requirement 100%  $E_{AS}$  guaranteed with full function reliability approved.

### Features

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

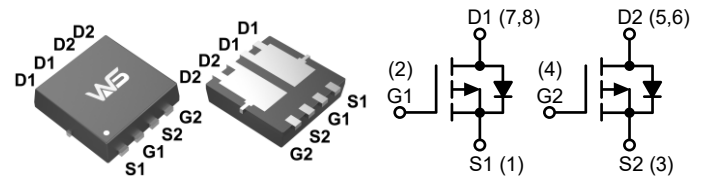
### Product Summary

$BV_{DSS}$	$R_{DS(ON)}$	$I_D$
-20V	13m $\Omega$	-25A

### Applications

- High Frequency Point-of-Load Synchronous Buck Converter for MB/NB/UMPC/VGA
- Networking DC-DC Power System
- Load Switch

### DFN3X3-8L Pin Configuration



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

Symbol	Parameter	Rating	Units	
$V_{DS}$	Drain-Source Voltage	-20	V	
$V_{GS}$	Gate-Source Voltage	$\pm 12$		
$I_D$	Continuous Drain Current <sup>1,3</sup>	$T_C=25^\circ\text{C}$	-25	
		$T_C=100^\circ\text{C}$	-16	
$I_{DM}$	Pulsed Drain Current <sup>2</sup>	-90	A	
$P_D$	Power Dissipation	$T_C=25^\circ\text{C}$	31.25	W
$T_{STG}$	Storage Temperature Range		-55 to 150	$^\circ\text{C}$
$T_J$	Operating Junction Temperature Range		-55 to 150	

### Thermal Data

Symbol	Parameter	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	---	4.0	$^\circ\text{C/W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V$ , $I_D=-250\mu A$	-20	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=-4.5V$ , $I_D=-11A$	---	13	17	m $\Omega$
		$V_{GS}=-2.5V$ , $I_D=-6A$	---	18	25	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$ , $I_D=-250\mu A$	-0.4	-0.52	-1.0	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS}=-20V$ , $V_{GS}=0V$	---	---	-1.0	$\mu A$
$I_{GSS}$	Gate Leakage Current	$V_{DS}=0V$ , $V_{GS}=\pm 12V$	---	---	$\pm 100$	nA
$Q_g$	Total Gate Charge	$V_{DS}=-10V$ , $V_{GS}=-4.5V$ , $I_D=-11A$	---	25	---	nC
$Q_{gs}$	Gate-Source Charge		---	1.5	---	
$Q_{gd}$	Gate-Drain Charge		---	10	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-10V$ , $V_{GEN}=-4.5V$ , $R_G=6\Omega$ , $I_D=-1A$ , $R_L=1.3\Omega$	---	9	---	ns
$T_r$	Rise Time		---	13	---	
$T_{d(off)}$	Turn-Off Delay Time		---	26	---	
$T_f$	Fall Time		---	160	---	
$C_{iss}$	Input Capacitance	$V_{DS}=-10V$ , $V_{GS}=0V$ , $f = 1.0\text{MHz}$	---	2000	---	pF
$C_{oss}$	Output Capacitance		---	310	---	
$C_{rss}$	Reverse Transfer Capacitance		---	260	---	

**Diode Characteristics**

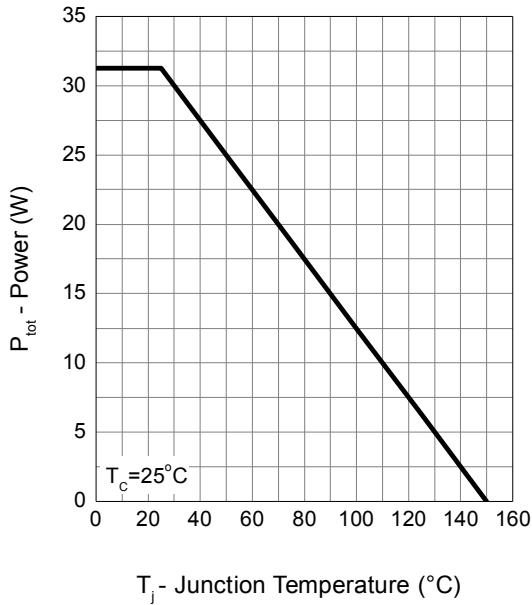
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Units
$I_S$	Continuous Source Current <sup>1,3</sup>	$T_C=25^\circ\text{C}$	---	---	-10	A
$V_{SD}$	Diode Forward Voltage	$V_{GS}=0V$ , $I_{SD}=-1A$	---	-0.73	-1.2	V

## Note:

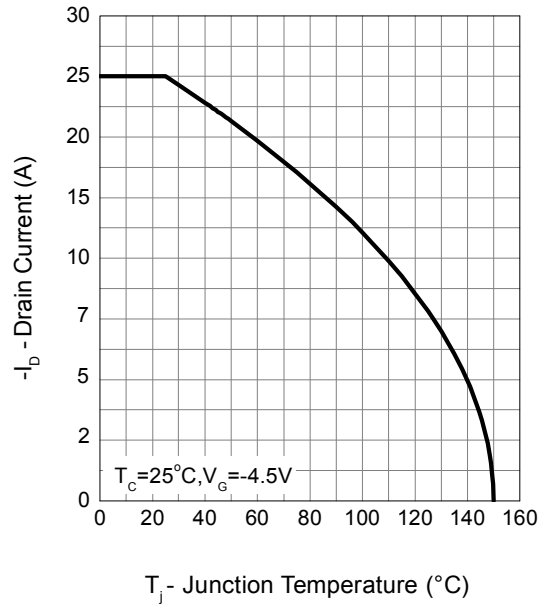
- The value of  $R_{\theta JA}$  is measured with the device mounted on 1 inch<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A=25^\circ\text{C}$ . The value in any given application depends on the user's specific board design.
- Repetitive rating, pulse width limited by junction temperature.
- The current rating is based on the  $t \leq 10s$  junction to ambient thermal resistance rating, Wire Bond Limited 25A.

**Typical Characteristics**

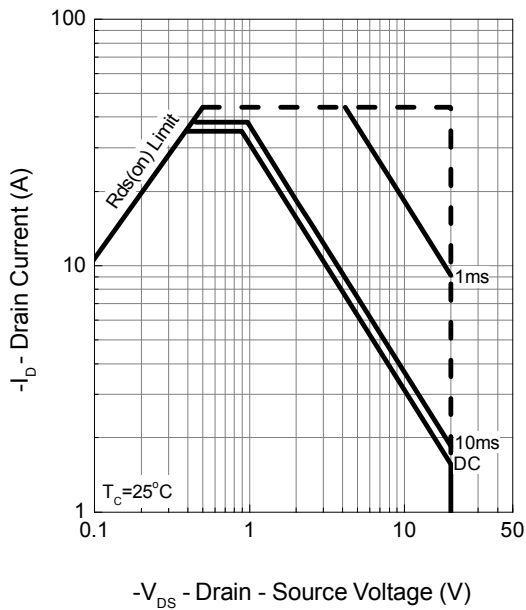
**Power Dissipation**



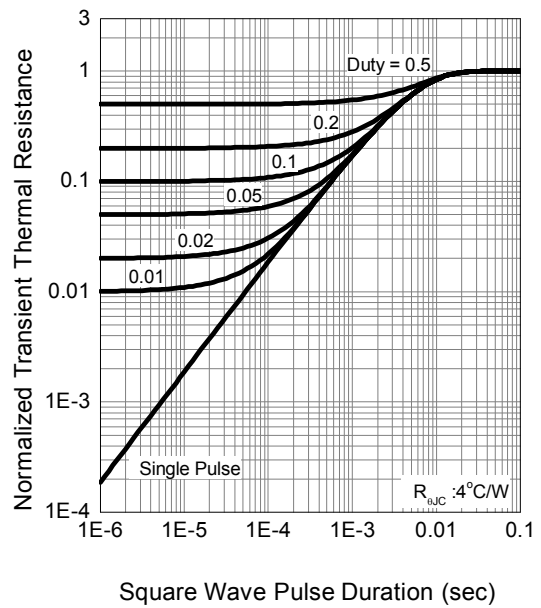
**Drain Current**



**Safe Operation Area**

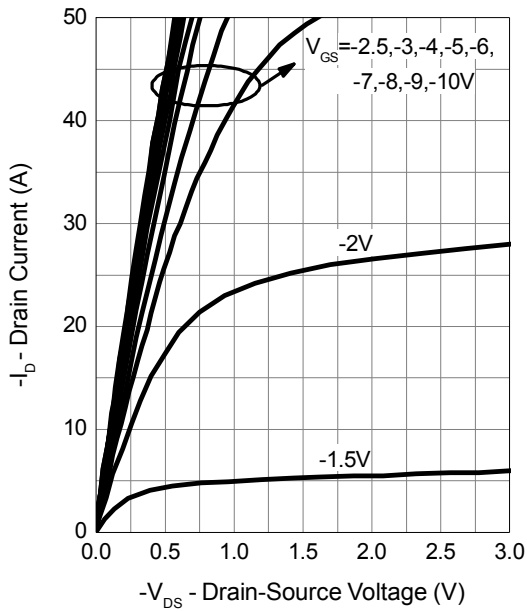


**Thermal Transient Impedance**

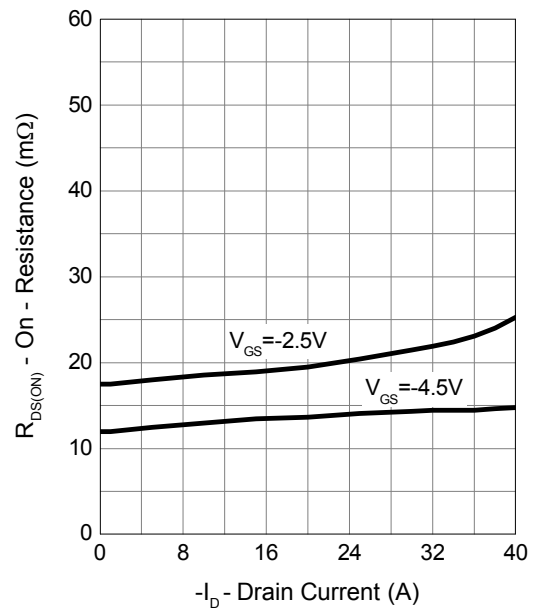


Typical Characteristics (Cont.)

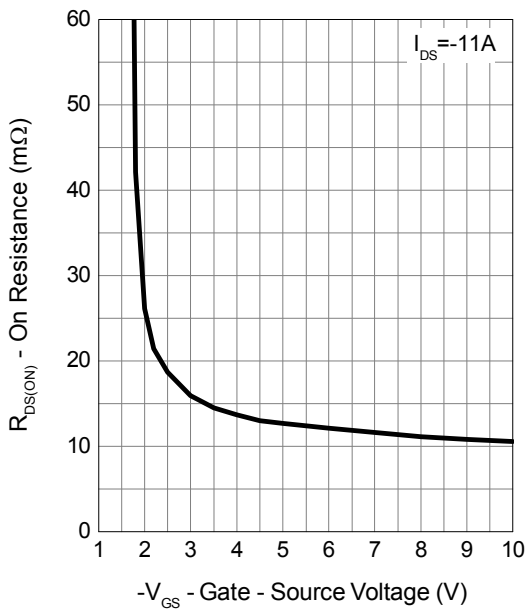
Output Characteristics



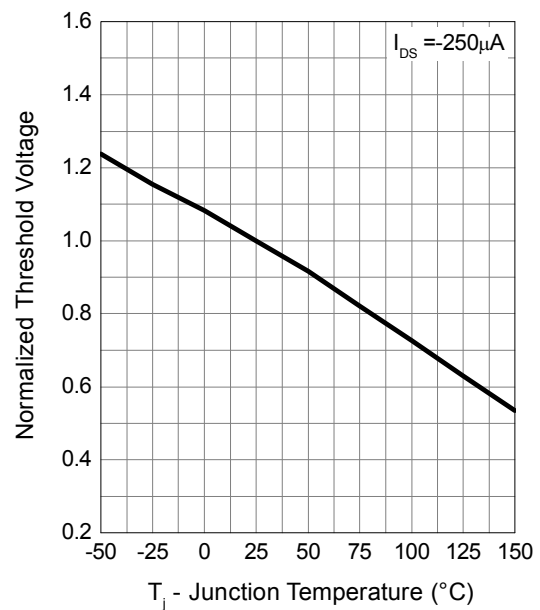
Drain-Source On Resistance



Gate-Source On Resistance

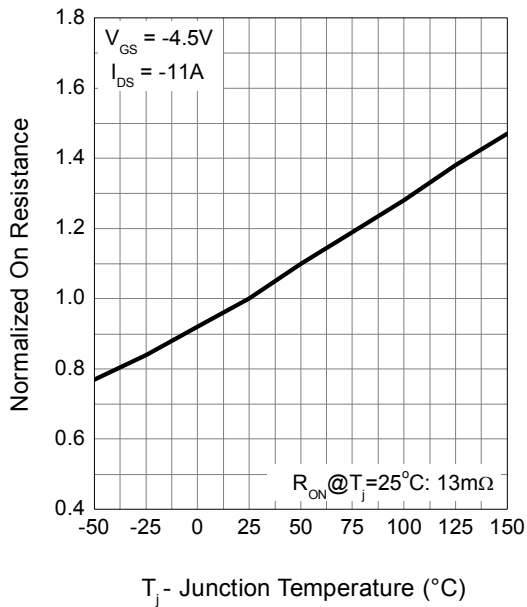


Gate Threshold Voltage

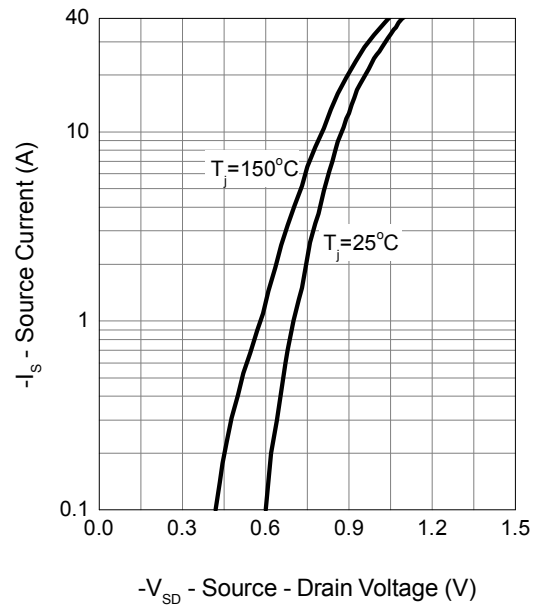


Typical Characteristics (Cont.)

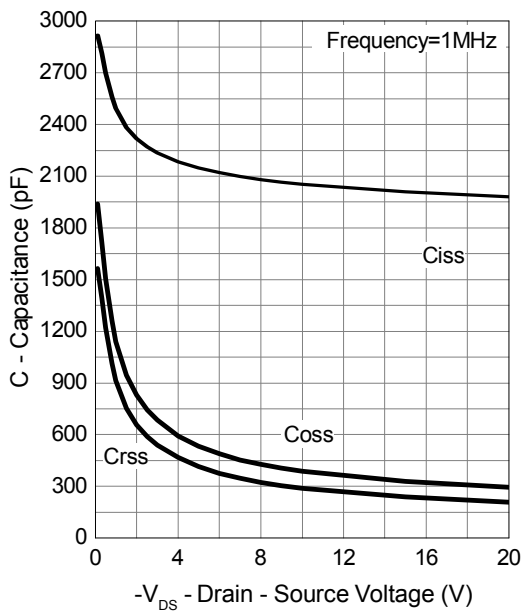
Drain-Source On Resistance



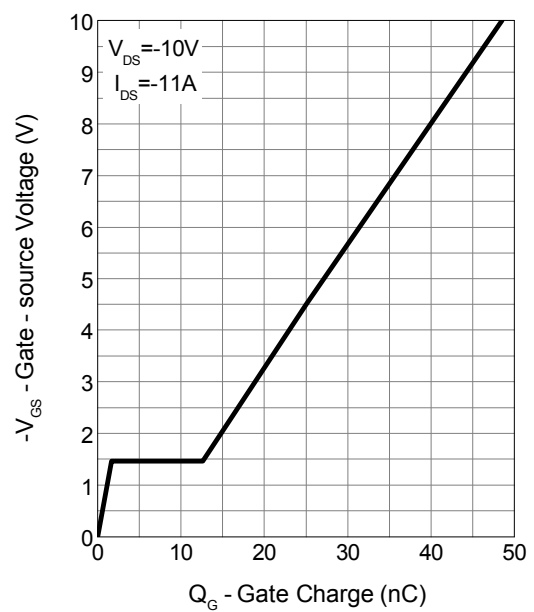
Source-Drain Diode Forward



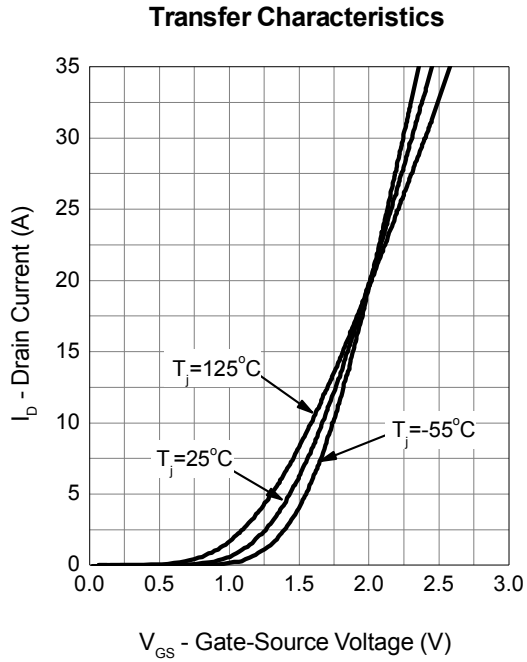
Capacitance

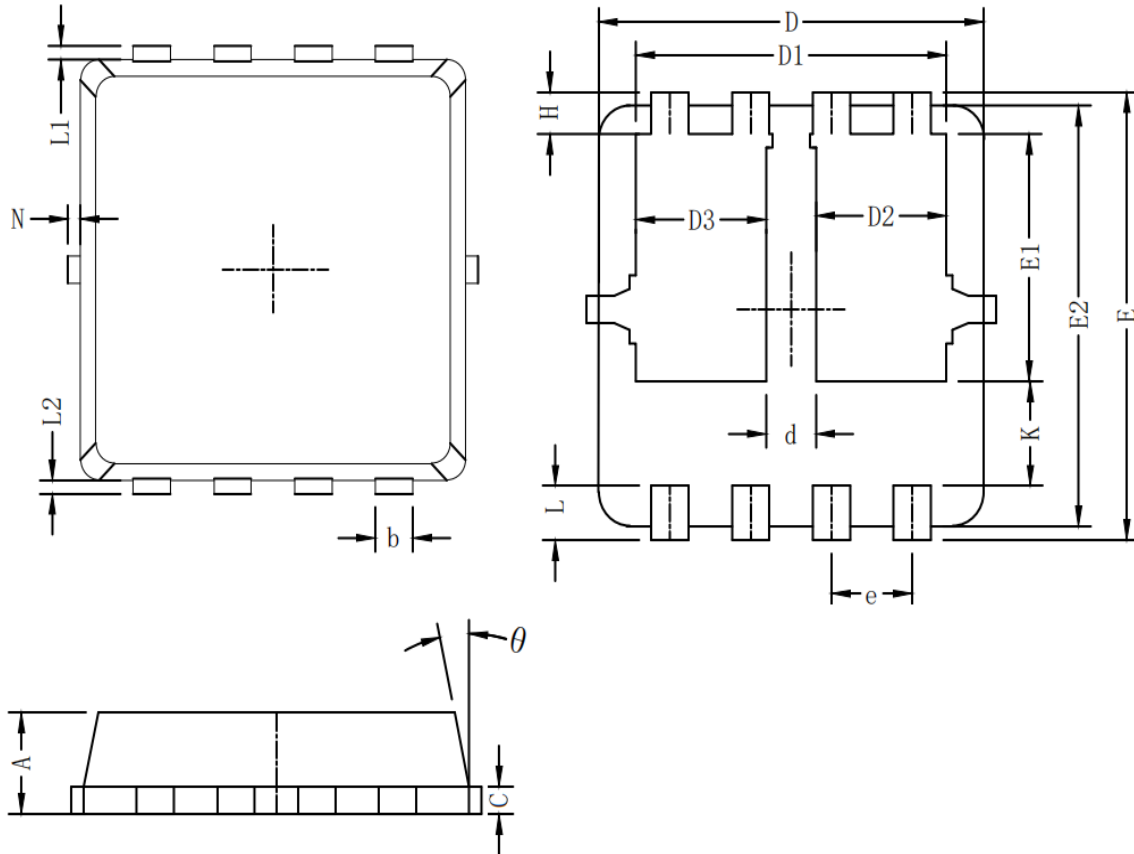


Gate Charge



Typical Characteristics (Cont.)



**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
D2/D3	0.8	1	1.2
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		
$\theta$	8°	10°	13°
N	0		0.15
d	0.3	0.4	0.5

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