

Dual N-Ch 30V Fast Switching MOSFETs

Features

- ★ Split Gate Trench MOS Technology
- ★ 100% EAS Guaranteed
- ★ Fast Switching Speed
- ★ Green Device Available

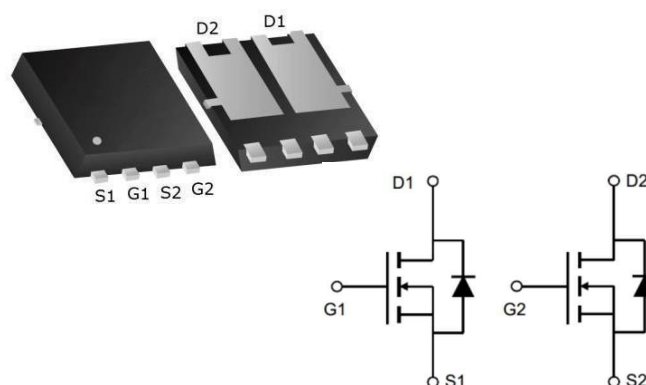
Applications

- ★ High Frequency Switching and Synchronous Rectification.
- ★ DC/DC Converter.

Product Summary

BVDSS	RDSON	ID
30V	5.0 mΩ	40A

PDFN3333-8L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	40	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	28	A
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	17	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	14	A
I_{DM}	Pulsed Drain Current ²	135	A
EAS	Single Pulse Avalanche Energy ³	39.8	mJ
I_{AS}	Avalanche Current	27	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	30	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ\text{C}$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	50	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	4.6	$^\circ\text{C/W}$

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Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	30	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=20A$	---	5	6.3	$m\Omega$
		$V_{GS}=4.5V$, $I_D=15A$	---	6.9	9	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	1.2	---	2.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=24V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=20A$	---	67	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	1.7	---	Ω
Q_g	Total Gate Charge (4.5V)	$V_{DS}=15V$, $V_{GS}=4.5V$, $I_D=15A$	---	8	---	nC
Q_{gs}	Gate-Source Charge		---	2.4	---	
Q_{gd}	Gate-Drain Charge		---	3.2	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V$, $V_{GS}=10V$, $R_G=3.3\Omega$ $I_D=15A$	---	7.1	---	ns
T_r	Rise Time		---	40	---	
$T_{d(off)}$	Turn-Off Delay Time		---	15	---	
T_f	Fall Time		---	6	---	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $f=1\text{MHz}$	---	814	---	pF
C_{oss}	Output Capacitance		---	208	---	
C_{rss}	Reverse Transfer Capacitance		---	201	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,6}	$V_G=V_D=0V$, Force Current	---	---	40	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1	V
t_{rr}	Reverse Recovery Time	$I_F=20A$, $di/dt=100A/\mu s$,	---	15	---	nS
Q_{rr}	Reverse Recovery Charge	$T_J=25^\circ\text{C}$	---	25	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V$, $V_{GS}=10V$, $L=0.1mH$, $I_{AS}=24A$
- 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.

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Typical Characteristics

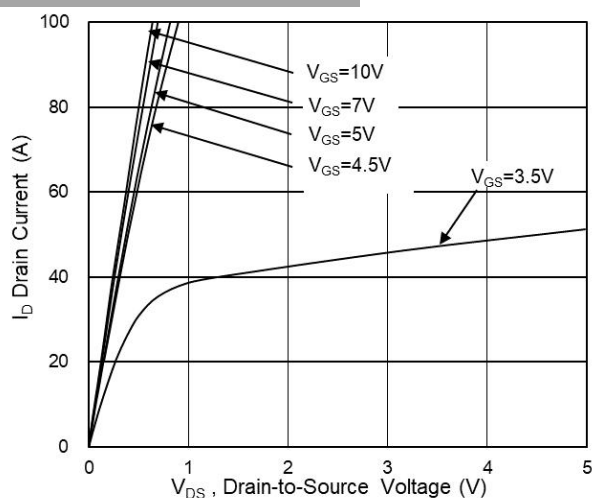


Fig.1 Typical Output Characteristics

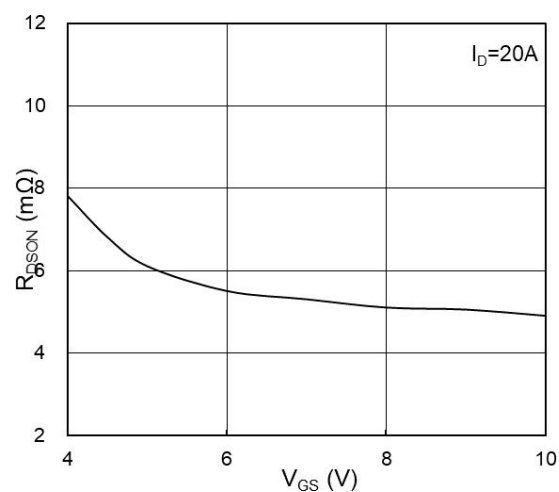


Fig.2 On-Resistance vs G-S Voltage

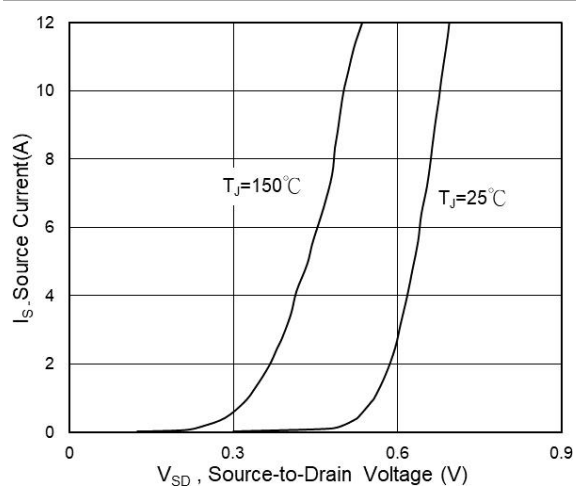


Fig.3 Source Drain Forward Characteristics

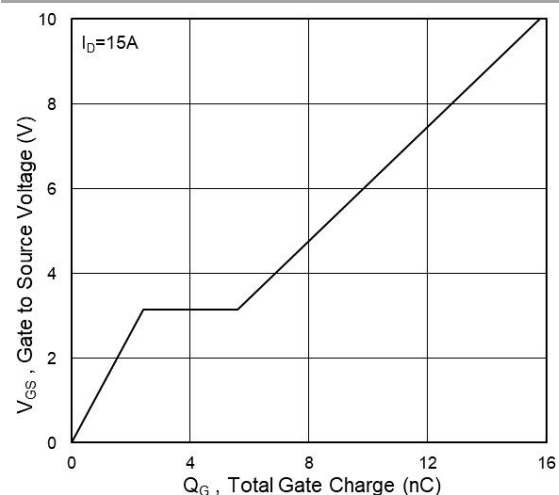


Fig.4 Gate-Charge Characteristics

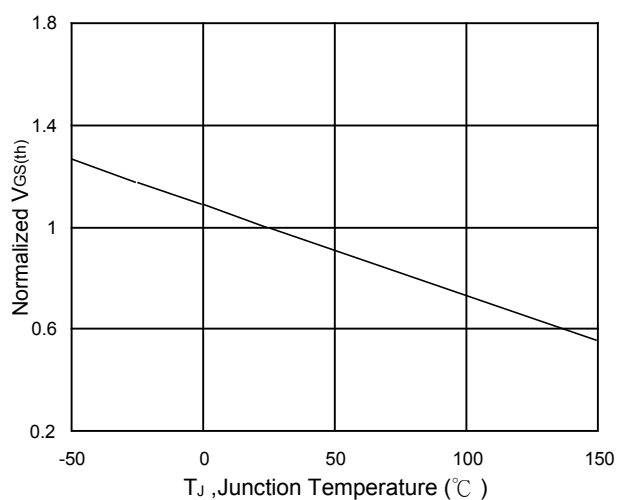


Fig.5 Normalized $V_{GS(th)}$ vs T_J

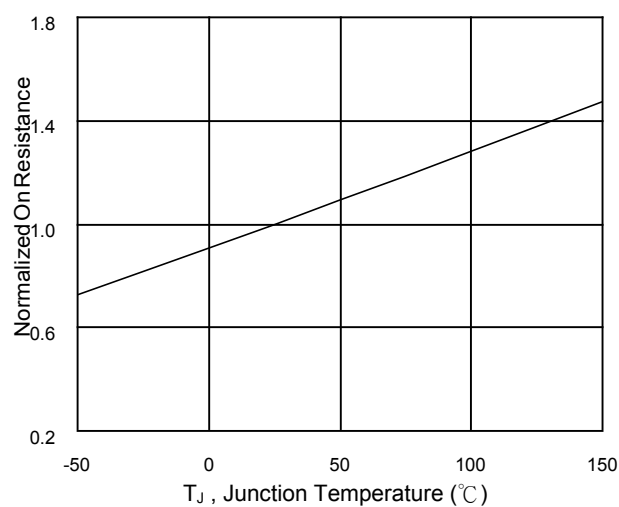


Fig.6 Normalized $R_{DS(on)}$ vs T_J

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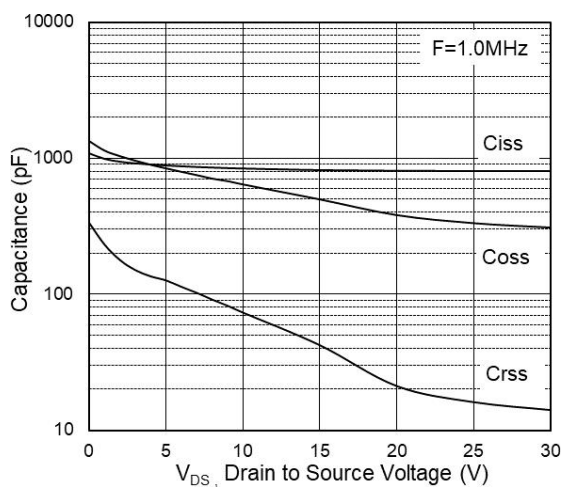


Fig.7 Capacitance

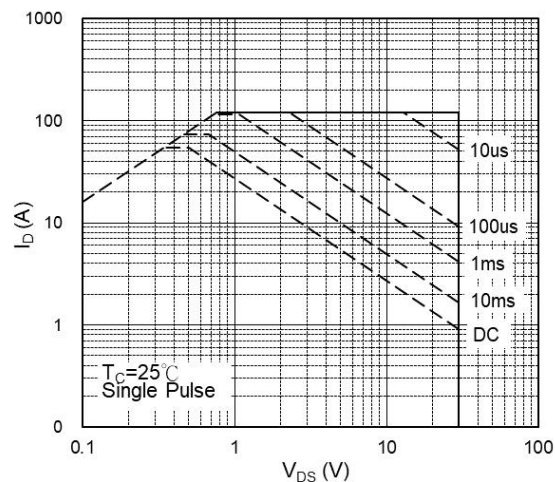


Fig.8 Safe Operating Area

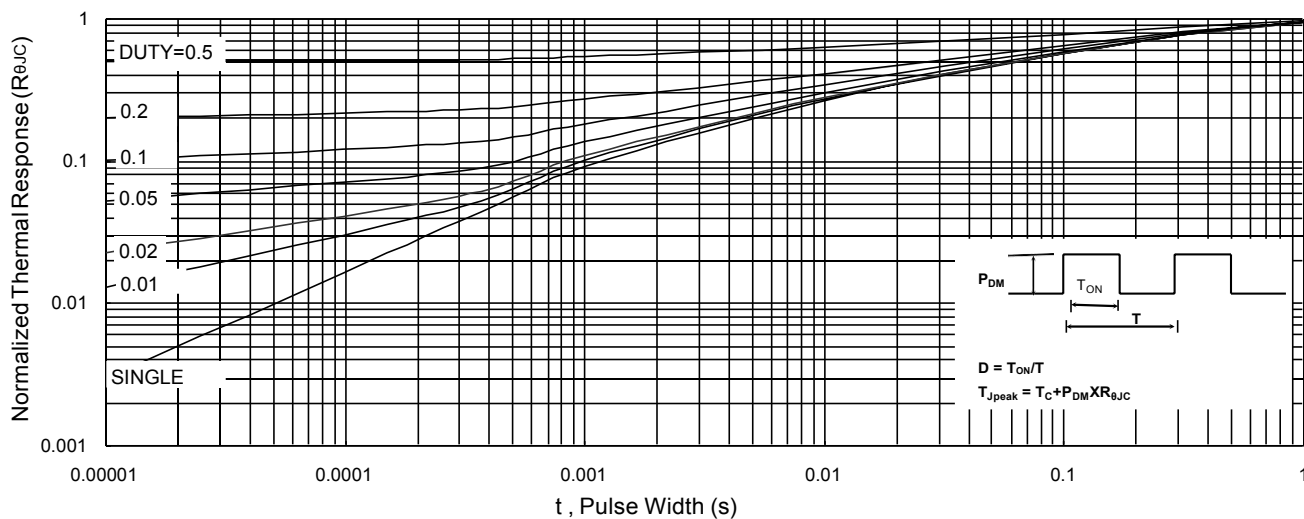


Fig.9 Normalized Maximum Transient Thermal Impedance

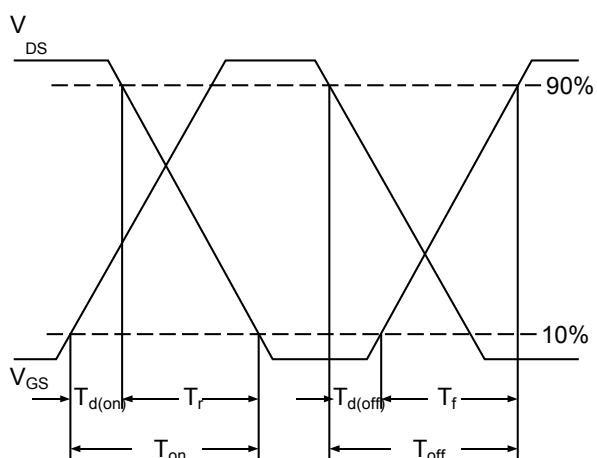


Fig.10 Switching Time Waveform

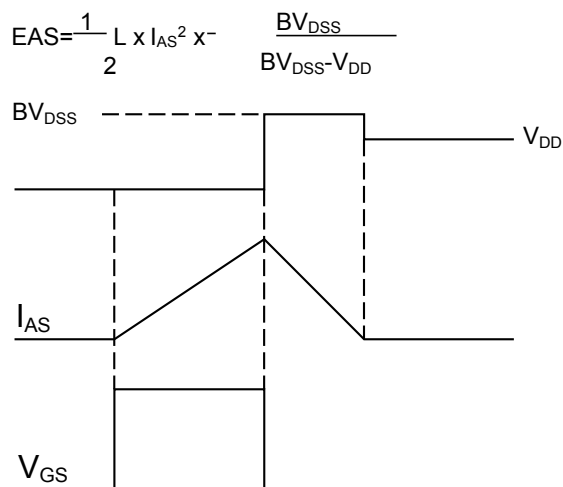
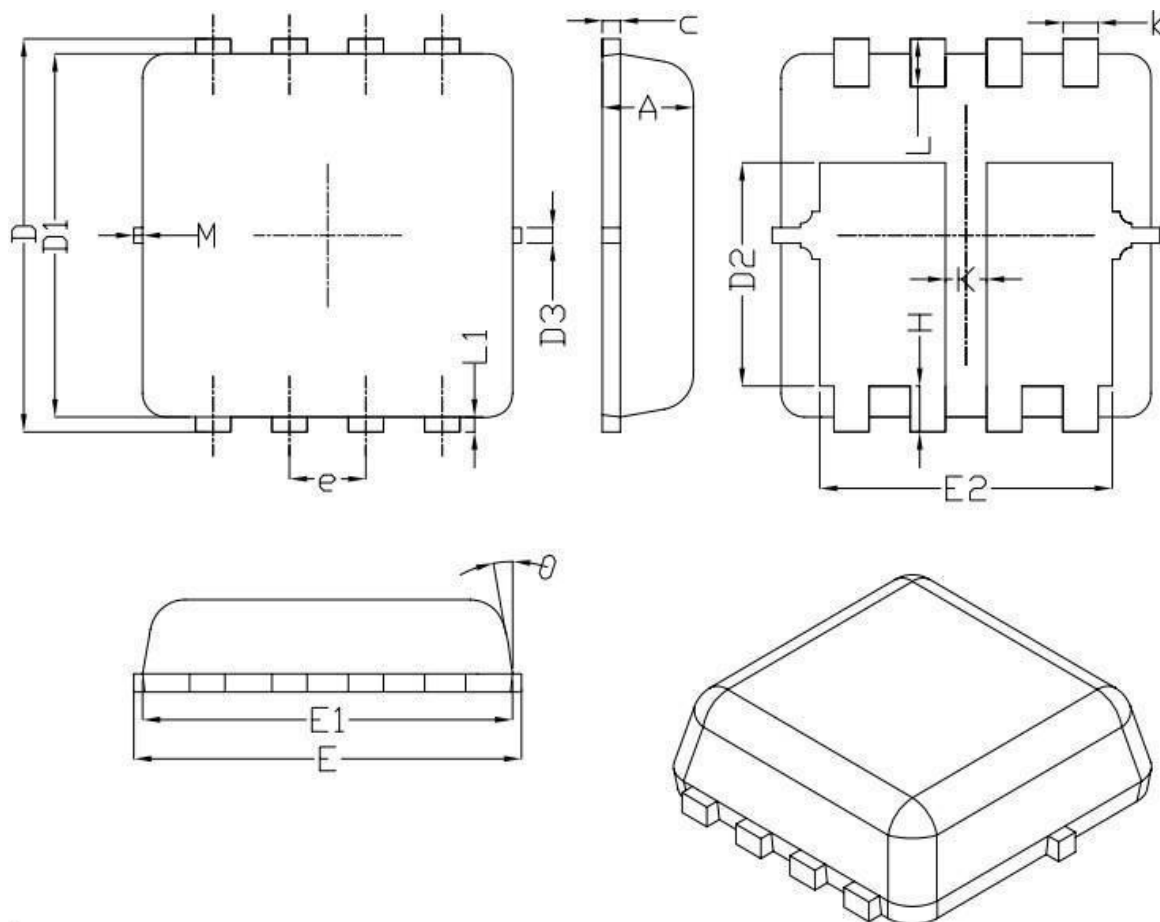


Fig.11 Unclamped Inductive Switching Waveform

Dual PDFN3333-8L Package Outline Data



Symbol	Dimensions (unit: mm)		
	Min	Typ	Max
A	0.70	0.75	0.80
b	0.25	0.30	0.35
c	0.10	0.15	0.25
D	3.25	3.35	3.45
D1	3.00	3.10	3.20
D2	1.78	1.88	1.98
D3	--	0.13	--
E	3.20	3.30	3.40
E1	3.00	3.15	3.20
E2	2.39	2.49	2.59
e	0.65 BSC		
H	0.30	0.39	0.50
L	0.30	0.40	0.50
L1	--	0.13	--
K	0.30	--	--
θ	--	10°	12°
M	*	*	0.15
* Not Specified			

Notes:

1. Refer to JEDEC MO-240 variation CA.
2. Dimensions "D1" and "E1" do NOT include mold flash protrusions or gate burrs.
3. Dimensions "D1" and "E1" include interterminal flash or protrusion.