

Product Summary

BVDSS	RDSON_Max	ID
-20V	14mΩ@10V	-30A

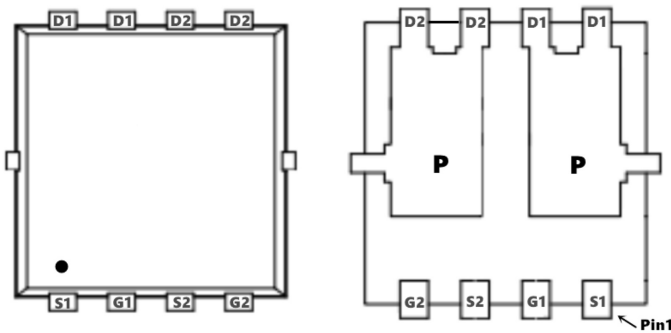
Features

- ❖ Advanced Trench MOSFET
- ❖ Technology 100% EAS Guaranteed
- ❖ Green Device Available

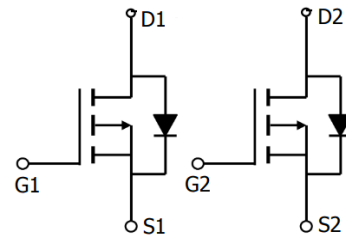
Application

- ❖ Lithium battery protection
- ❖ Wireless impact
- ❖ Mobile phone fast charging

PDFN3333-D



EQUIVALENT CIRCUIT



Absolute Maximum Rating (Ta=25°C)

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	-20	V
Gate-source voltage	V_{GS}	±12	V
Continuous drain current ($V_{GS}=-4.5V$) ⁽¹⁾	I_D	-30	A
	I_D	-19	
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	-90	A
Power dissipation	P_D	1.5	W
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	°C

Thermal Characteristic (Ta=25°C)

Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient ⁽³⁾	$R_{\theta JA}$	--	85	°C/W
Thermal Resistance, Junction-to-Case ⁽³⁾	$R_{\theta JC}$	--	13	°C/W

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

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Off characteristics							
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D = -250μA		-20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-20V, V _{GS} =0V	T _J =25℃			-1.0	μA
			T _J =125℃			-100	
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V				±100	nA
On characteristics ⑤							
Gate-threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA		-0.45	-0.65	-0.9	V
Static drain-source on-sate resistance	R _{DS(on)}	V _{GS} =-4.5V, I _D =-20A			10.2	14	mΩ
		V _{GS} =-2.5V, I _D =-10A			12.5	15	
Dynamic characteristics ⑤⑥							
Input capacitance	C _{iss}	V _{DS} =-10V,V _{GS} =0V, f =1MHz			1900		pF
Output capacitance	C _{oss}				232		
Reverse transfer capacitance	C _{rss}				228		
Gate resistance	R _g	f =1MHz			9.1		Ω
Switching characteristics ⑤⑥							
Total gate charge	Q _g	V _{GS} =-4.5V,V _{DS} =-10V, I _D =-8A			14.7		nC
Gate-source charge	Q _{gs}				2.1		
Gate-drain charge	Q _{gd}				4.9		
Turn-on delay time	t _{d(on)}	V _{DD} =-10V,R _L =1Ω, V _{GS} =-4.5V, R _{GEN} =3.3Ω			9.5		ns
Turn-on rise time	t _r				33		
Turn-off delay time	t _{d(off)}				24		
Turn-off fall time	t _f				9		
Drain-Source Diode Characteristics							
Drain-source diode forward voltage	V _{SD} ⑤	V _{GS} =0V, I _S =-1A				-1.2	V
Continuous drain-source diode forward current	I _S ①					-20	A
Pulsed drain-source diode forward current	I _{SM} ②					-48	A

Notes:

 1. T_C = 25 °C Limited only by maximum temperature allowed.

 2. P_W ≤ 10μs, Duty cycle ≤ 1%.

 3. EAS condition: V_{DD} = 15V, V_{GS} = 10V, L = 0.5mH, R_g = 25Ω Starting T_J = 25 °C.

 4. EAS condition: V_{DD} = -15V, V_{GS} = -10V, L = 0.5mH, R_g = 25Ω Starting T_J = 25 °C.

5. Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

6. Guaranteed by design, not subject to production.

 7. The value of RθJA is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a = 25 °C. t ≤ 10sec.

Typical Characteristics

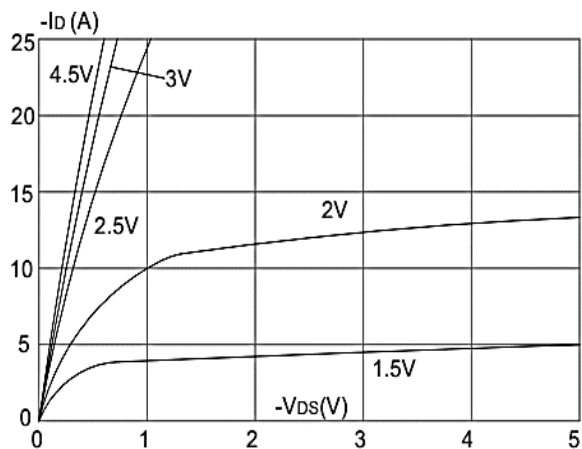


Figure 1: Output Characteristics

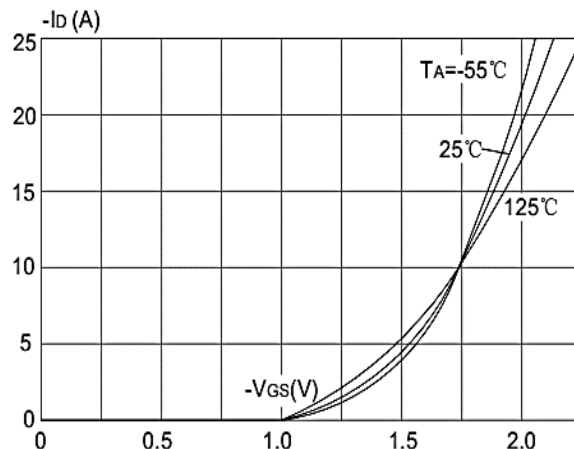


Figure 2: Typical Transfer Characteristics

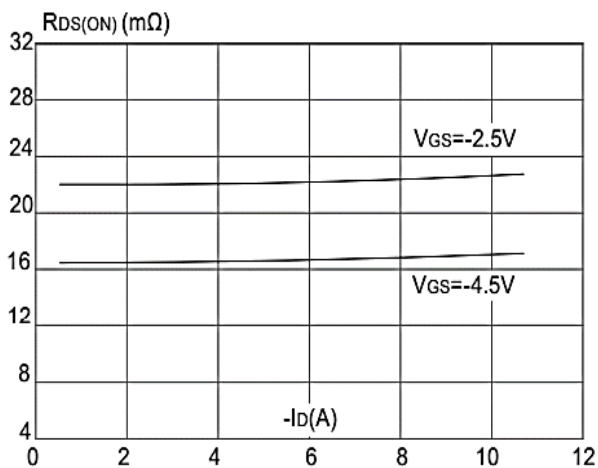


Figure 3: On-resistance vs. Drain Current

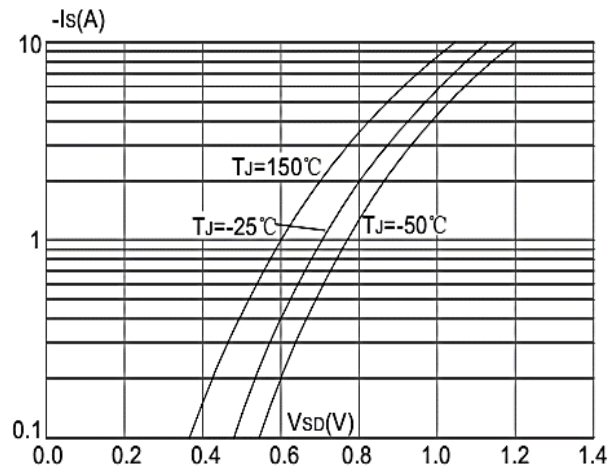


Figure 4: Body Diode Characteristics

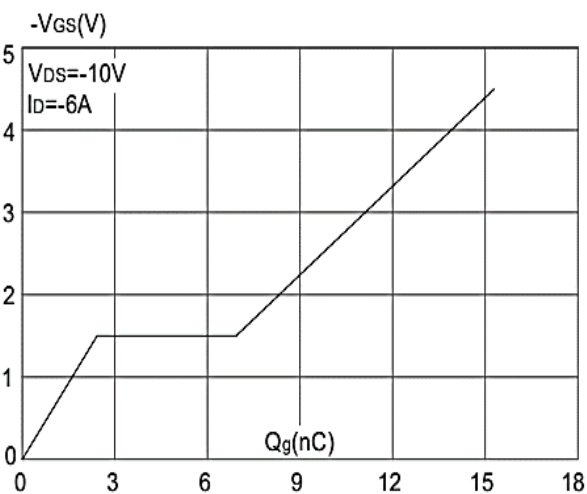


Figure 5: Gate Charge Characteristics

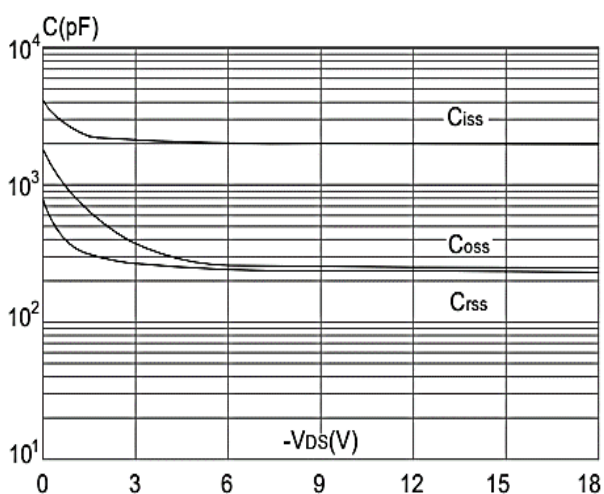


Figure 6: Capacitance Characteristics

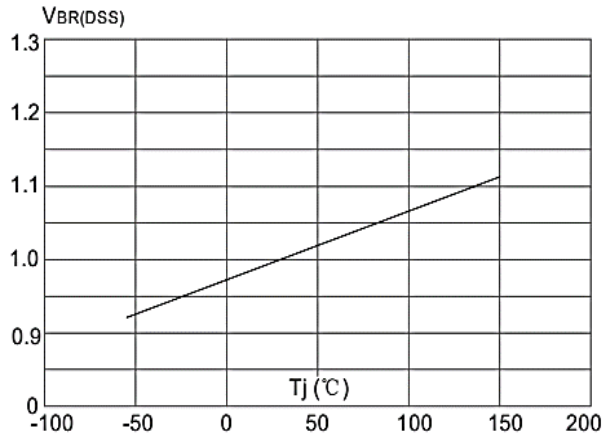


Figure 7: Normalized Breakdown Voltage vs Junction Temperature

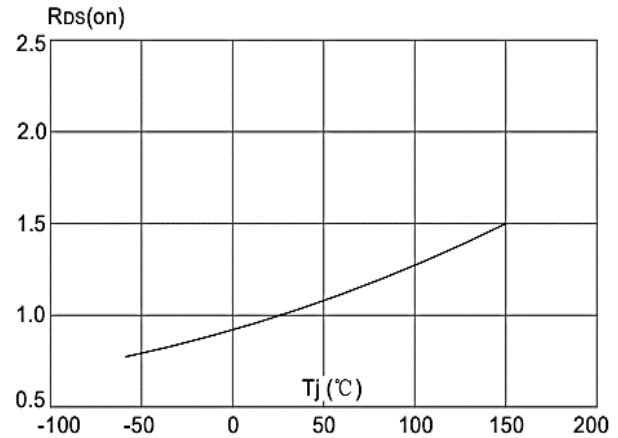


Figure 8: Normalized on Resistance vs. Junction Temperature

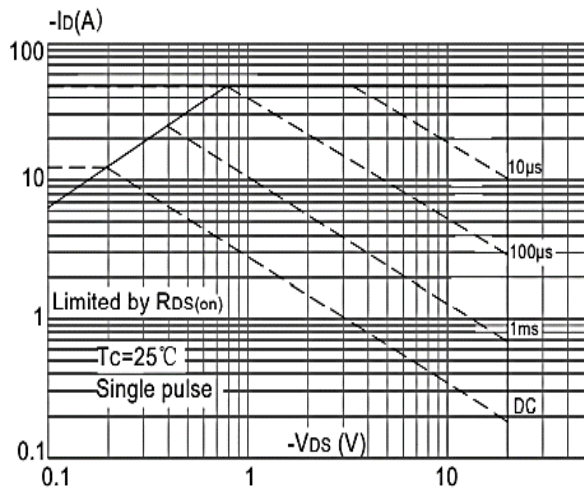


Figure 9: Maximum Safe Operating Area

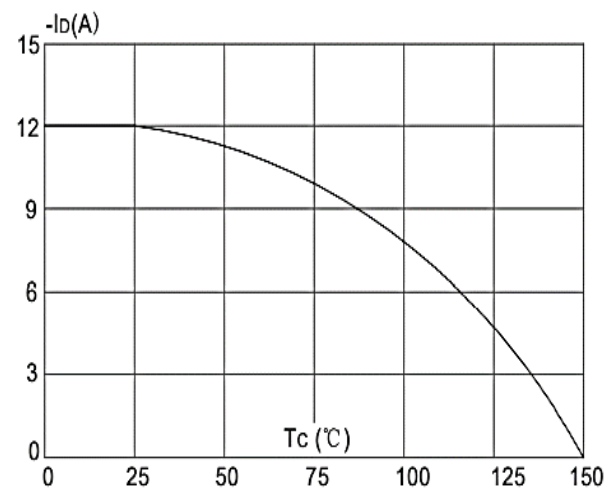


Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature

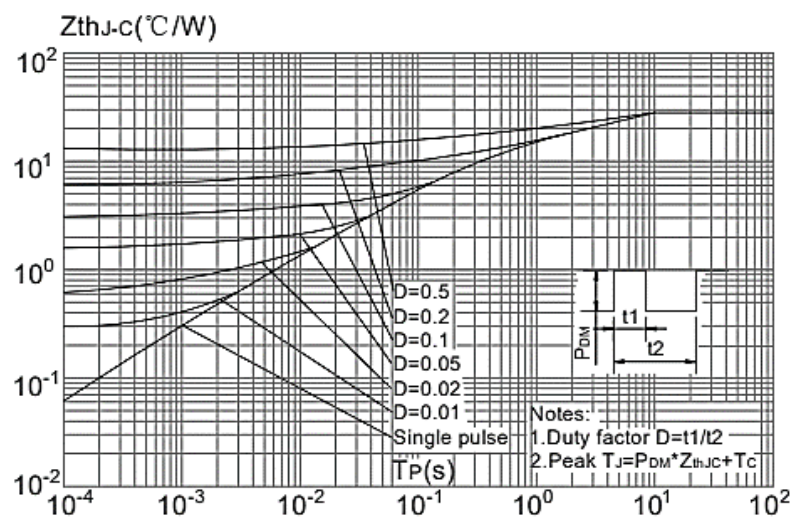
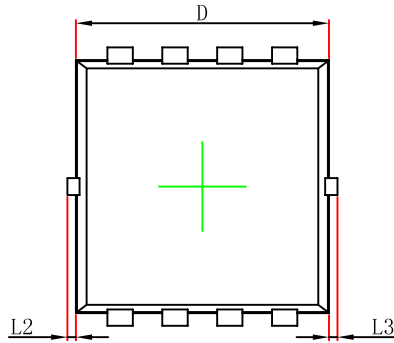
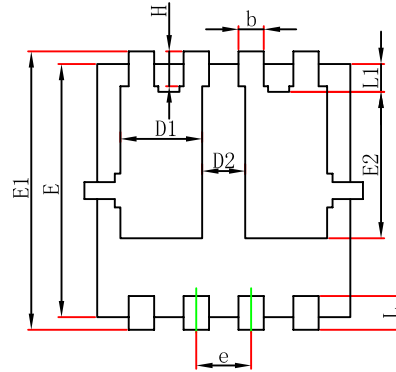


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambien

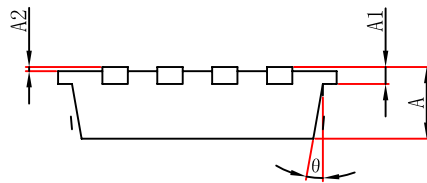
Outline Drawing PDFN3333-D



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

Important Notice

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