★ Green Device Available
★ Super Low Gate Charge
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology
★ 100% EAS Guaranteed

Product Summary

RoHS

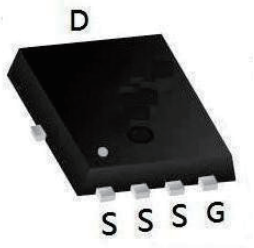
BVDSS	RDSON	ID
30V	4.7mΩ	60A

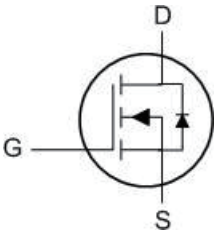
Description

The 60N03D is the high cell density trenched N-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The 60N03D meet the RoHS and Green Product, requirement 100% EAS guaranteed with full function reliability approved.

PRPAK3*3 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°C	Continuous Drain Current, V_{GS} @ 10V[1]	60	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V[1]	30	A
I_{DM}	Pulsed Drain Current[2]	160	A
E_{AS}	Single Pulse Avalanche Energy[3]	58	mJ
I_{AS}	Avalanche Current	60	A
P_D@T_C=25°C	Total Power Dissipation[4]	25	W
T_{STG}	Storage Temperature Range	−55 to 150	°C
T_J	Operating Junction Temperature Range	−55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient[1]	-	75	°C/W

Electrical Characteristics (T_J =25 °C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	30	-	–	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance2	V_{GS}=10V , I_D=20A	-	4.7	6	mΩ
		V_{GS}=4.5V , I_D=10A	-	6.5	9	
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.2	-	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=24V , V_{GS}=0V , T_J=25°C	-	-	1	uA
		V_{DS}=24V , V_{GS}=0V , T_J=55°C	-	-	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}= ±20V , V_{DS}=0V	-	-	±100	nA
g_{fs}	Forward Transconductance	V_{DS}=5V , I_D=30A	-	43	–	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	-	1.7	–	Ω
Q_g	Total Gate Charge (4.5V)	V_{DS}=15V , V_{GS}=4.5V , I_D=15A	-	34	–	nC
Q_{gs}	Gate-Source Charge		-	6	–	
Q_{gd}	Gate-Drain Charge		-	9	–	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=15V , V_{GS}=10V , R_G=3.3Ω I_D=15A	-	8.5	–	ns
T_r	Rise Time		-	103	–	
$T_{d(off)}$	Turn-Off Delay Time		-	37.3	–	
T_f	Fall Time		-	105	–	
C_{iss}	Input Capacitance	V_{DS}=15V , V_{GS}=0V , f=1MHz	-	1600	–	pF
C_{oss}	Output Capacitance		-	245	–	
C_{rss}	Reverse Transfer Capacitance		-	215	–	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	-	-	60	A
I_{SM}	Pulsed Source Current [2,6]		-	-	140	A
V_{SD}	Diode Forward Voltage [2]	V_{GS}=0V , I_S=1A , T_J=25°C	-	-	1	V

Note :
1.The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=48A
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 Performance Characteristics

Figure1: Output Characteristics

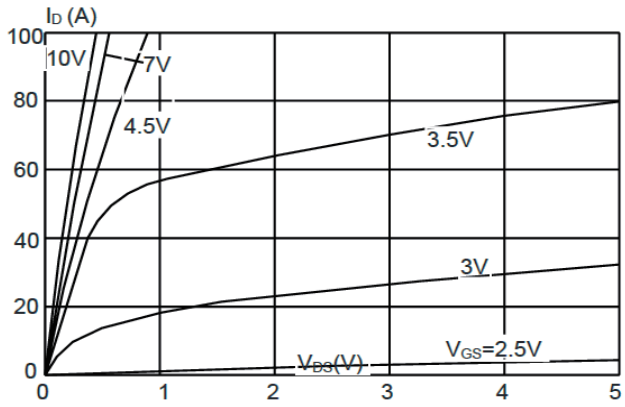


Figure 2: Typical Transfer Characteristics

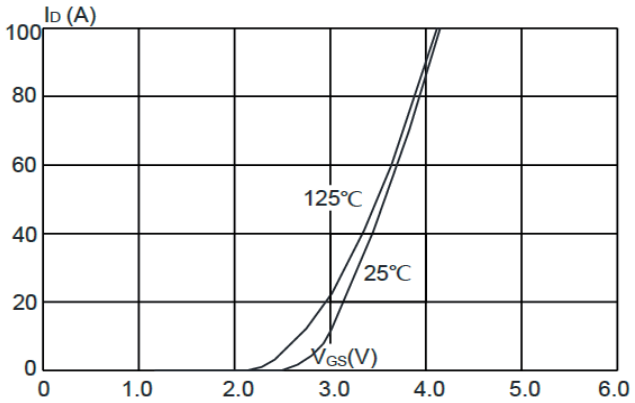


Figure 3:On-resistance vs. Drain Current

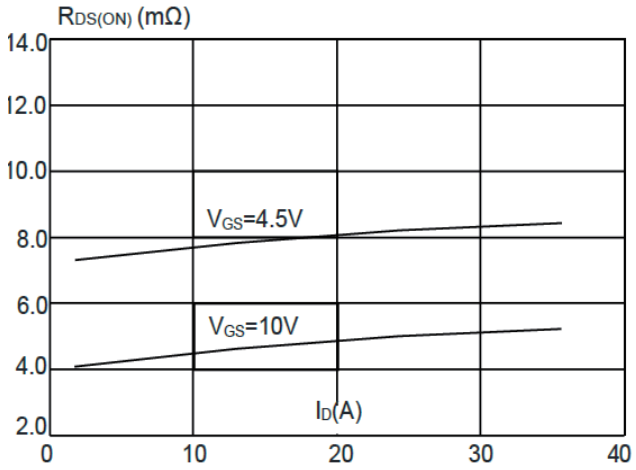


Figure 4: Body Diode Characteristics

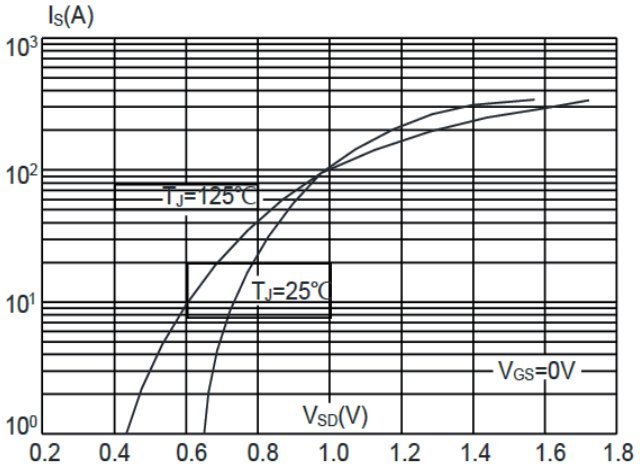


Figure 5: Gate Charge Characteristics

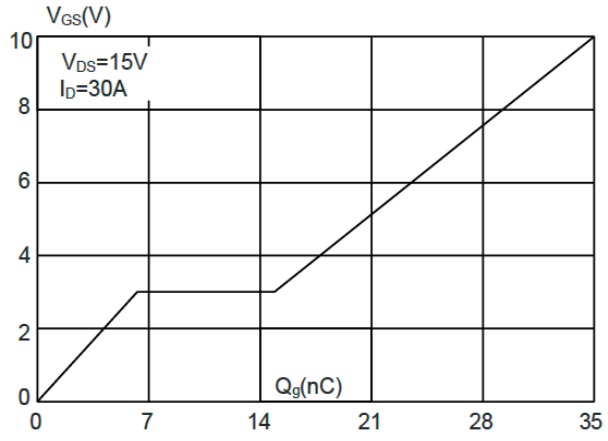
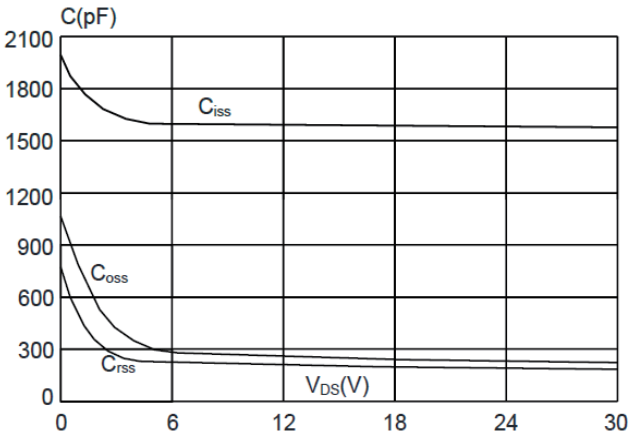


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage

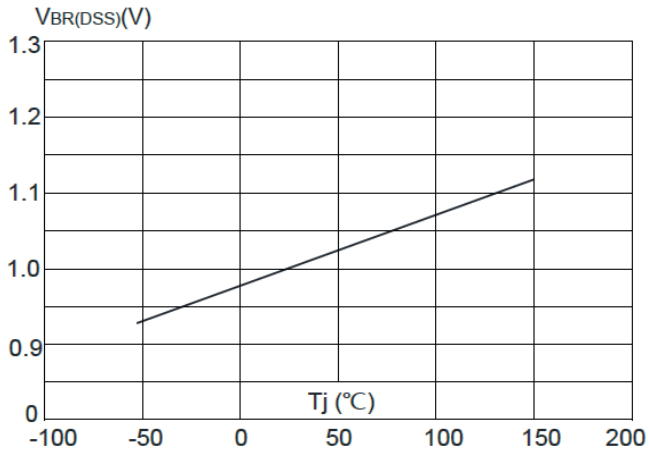


Figure 8: Normalized on Resistance vs.

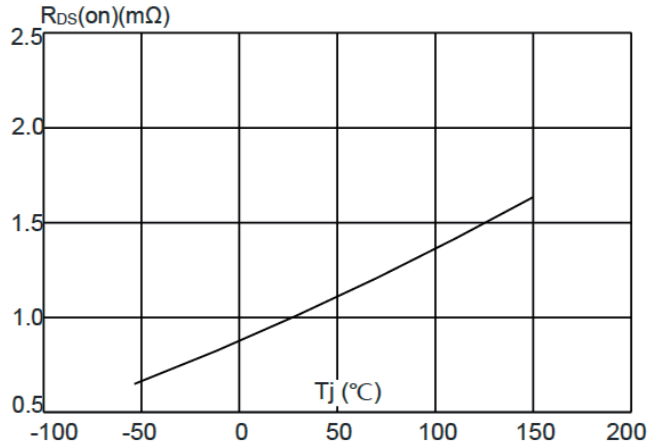


Figure 9: Maximum Safe Operating Area

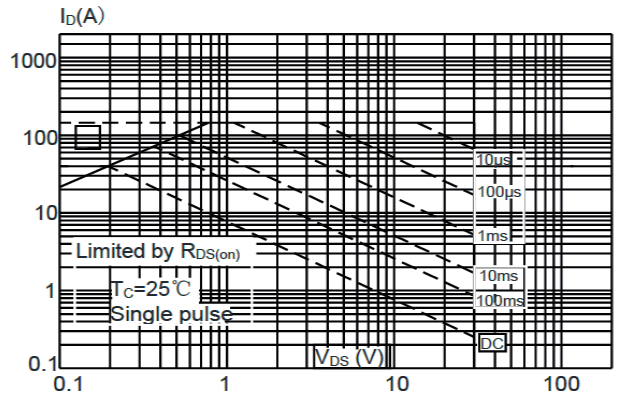


Figure 10: Maximum Continuous Drain Cu

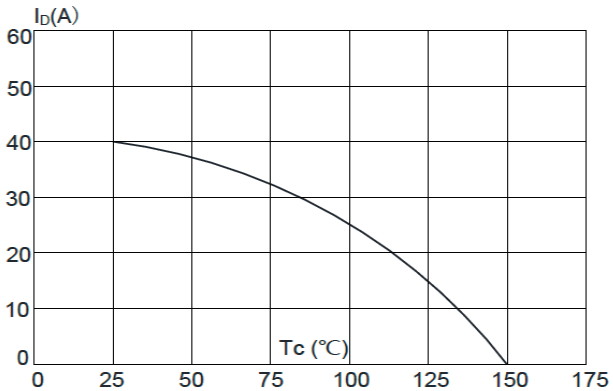
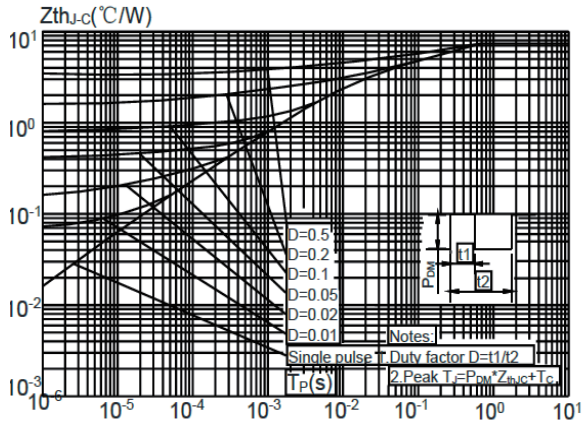


Figure 11: Maximum Effective Transient



Test Circuit

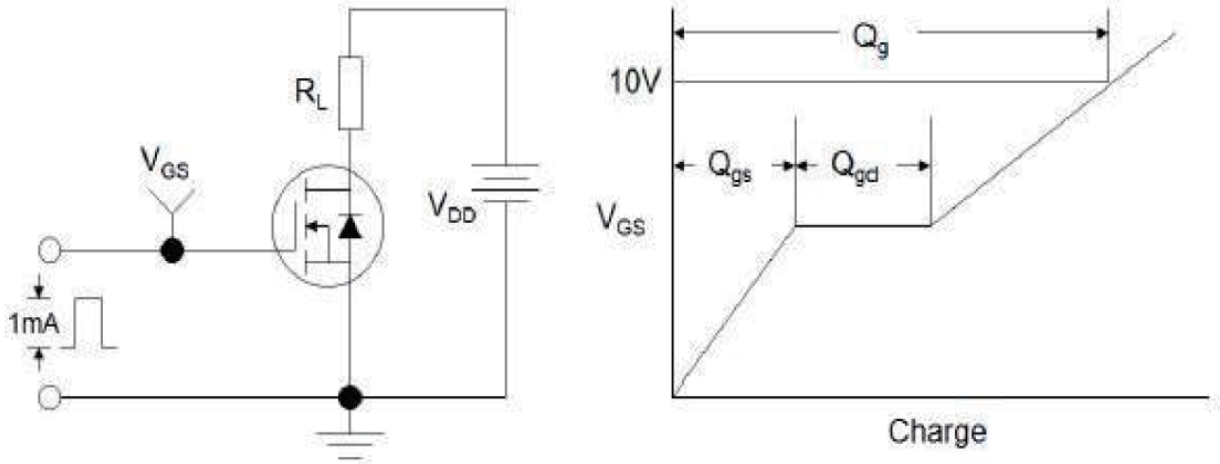


Figure1:Gate Charge Test Circuit & Waveform

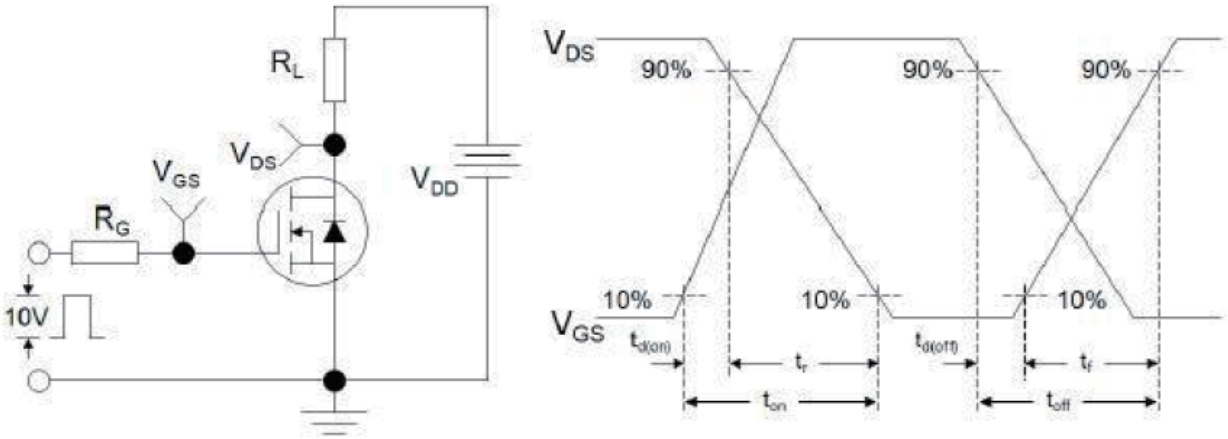


Figure 2: Resistive Switching Test Circuit & Waveforms

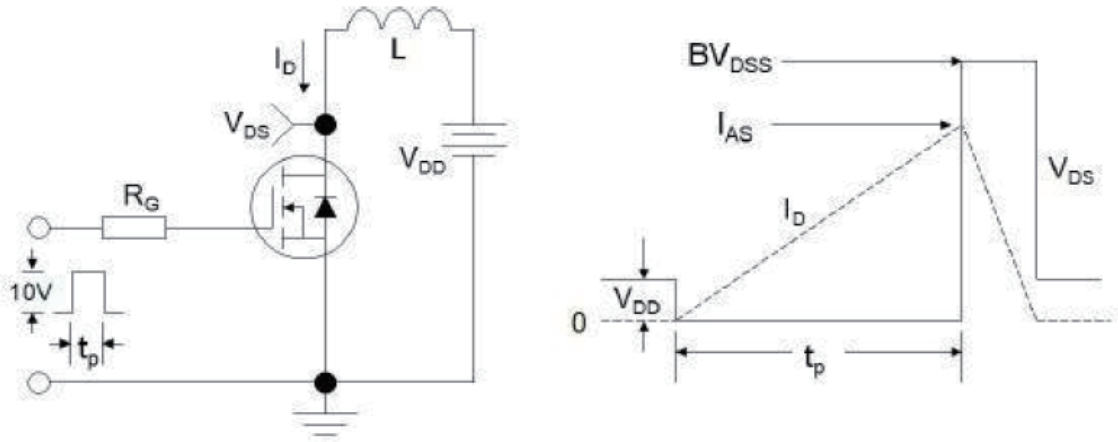
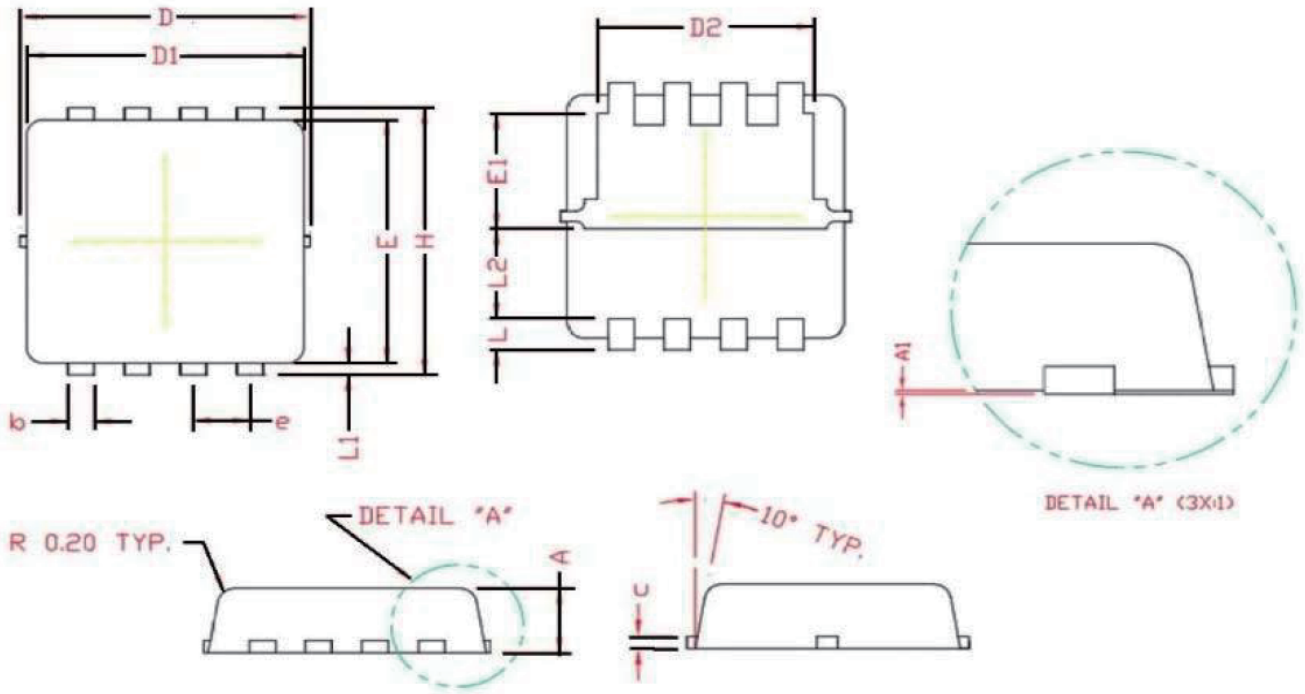


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

PDFN3333-8L Package Information



Symbol	MILLMETER		
	MIN	MON	MAX
A	0. 70	0. 80	0. 90
A1	0. 00	0. 03	0. 05
b	0. 24	0. 30	0. 35
c	0. 10	0. 15	0. 20
D	3. 25	3. 32	3. 40
D1	3. 05	3. 15	3. 25
D2	2. 40	2. 50	2. 60
E	3. 00	3. 10	3. 20
E1	1. 35	1. 45	1. 55
e	0. 65BSC.		
H	3. 20	3. 30	3. 40
L	0. 30	0. 40	0. 50
L1	0. 10	0. 15	0. 20
L2	1. 13REF.		

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