

Description

The 100N03DF 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 100N03DF meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

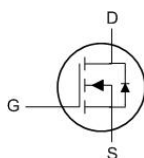
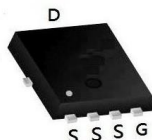
Super Low Gate Charge

100% EAS Guaranteed

Green Device Available

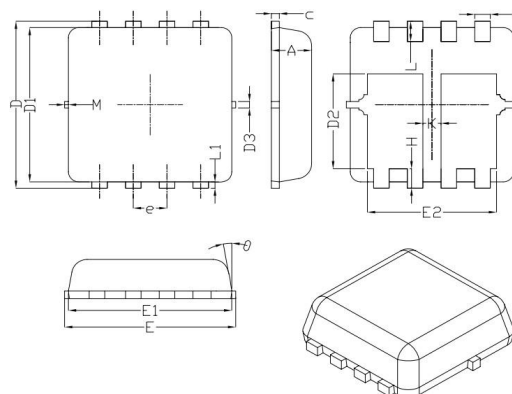
Excellent CdV/dt effect decline

Advanced high cell density Trench technology



Product Summary

BVDSS	RDSON	ID
30V	3.3mΩ	100A



Symbol	Dimensions (unit: mm)			Symbol	Dimensions (unit: mm)		
	Min	Typ	Max		Min	Typ	Max
A	0.70	0.75	0.80	E2	2.39	2.49	2.59
b	0.25	0.30	0.35	e	0.65 BSC		
c	0.10	0.15	0.25	H	0.30	0.39	0.50
D	3.25	3.35	3.45	L	0.30	0.40	0.50
D1	3.00	3.10	3.20	L1	--	0.13	--
D2	1.78	1.88	1.98	K	0.30	--	--
D3	--	0.13	--	θ	--	10°	12°
E	3.20	3.30	3.40	M	*	*	0.15
E1	3.00	3.15	3.20	* 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.

Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		10s	Steady State	
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, $V_{GS} @ 10V^1$	100		A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	50		A
$I_D@T_A=25^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	30	19	A
$I_D@T_A=70^\circ\text{C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	25	16	A
I_{DM}	Pulsed Drain Current ²	162		A
EAS	Single Pulse Avalanche Energy ³	144.7		mJ
I_{AS}	Avalanche Current	53.8		A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	62.5		W
$P_D@T_A=25^\circ\text{C}$	Total Power Dissipation ⁴	6	2.42	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	---	62	°C/W
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹ (t ≤ 10s)	---	25	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	2.4	°C/W

100N03DF

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	1.0	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =30A	-	3.3	4.7	mΩ
		V _{GS} =4.5V, I _D =20A	-	4.5	7.5	
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	3450	-	pF
C _{oss}	Output Capacitance		-	330	-	pF
C _{rss}	Reverse Transfer Capacitance		-	295	-	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =30A, V _{GS} =10V	-	45	-	nC
Q _{gs}	Gate-Source Charge		-	3	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	15	-	nC
t _{d(on)}	Turn-on Delay Time	V _{DS} =15V, I _D =30A, R _{GEN} =3Ω, V _{GS} =10V	-	21	-	ns
t _r	Turn-on Rise Time		-	32	-	ns
t _{d(off)}	Turn-off Delay Time		-	59	-	ns
t _f	Turn-off Fall Time		-	34	-	ns
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	50	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	200	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =20A, dI/dt=100A/μs	-	15	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	4	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25°C, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=18.4A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

RATING AND CHARACTERISTIC CURVES (100N03DF)

Figure 1: Output Characteristics

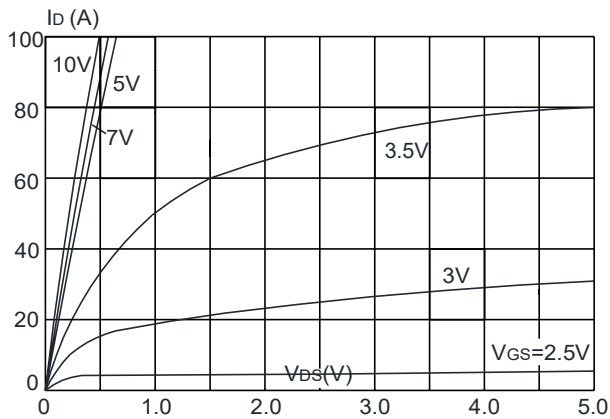


Figure 2: Typical Transfer Characteristics

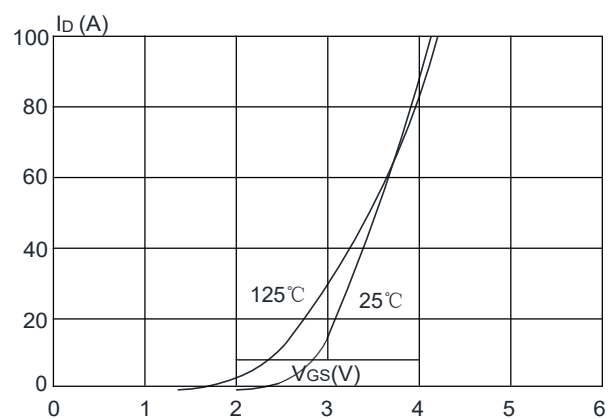


Figure 3: On-resistance vs. Drain Current

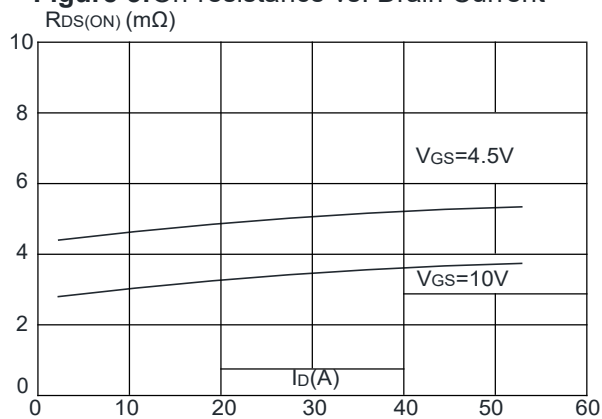


Figure 4: Body Diode Characteristics

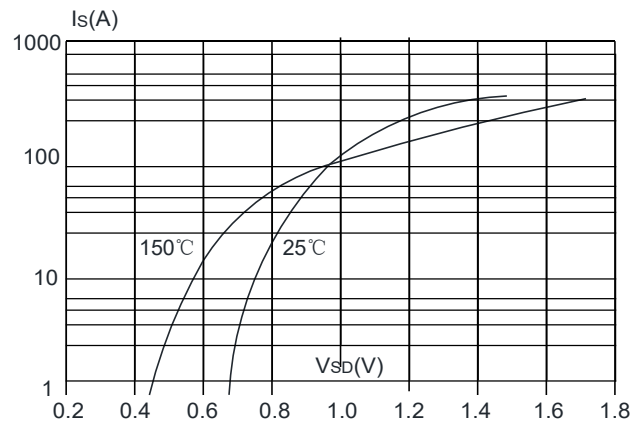


Figure 5: Gate Charge Characteristics

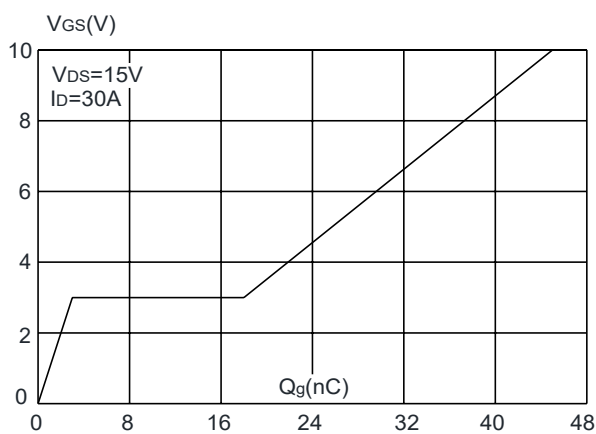
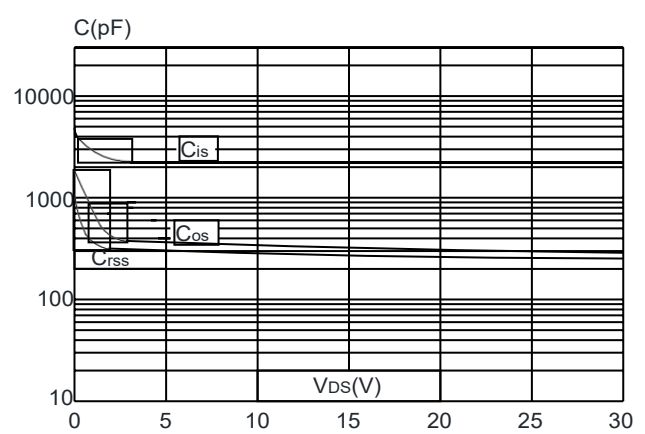


Figure 6: Capacitance Characteristics



RATING AND CHARACTERISTIC CURVES (100N03DF)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

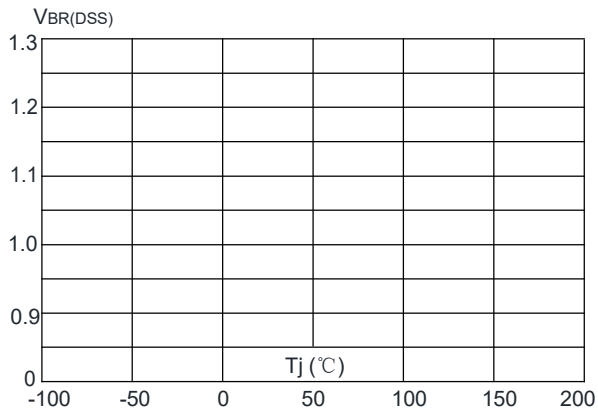


Figure 8: Normalized on Resistance vs. Junction Temperature

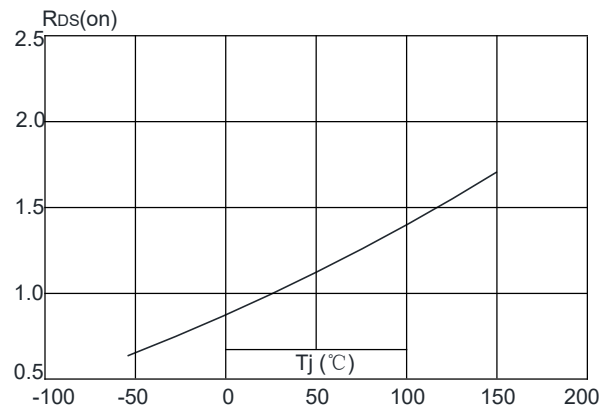


Figure 9: Maximum Safe Operating Area

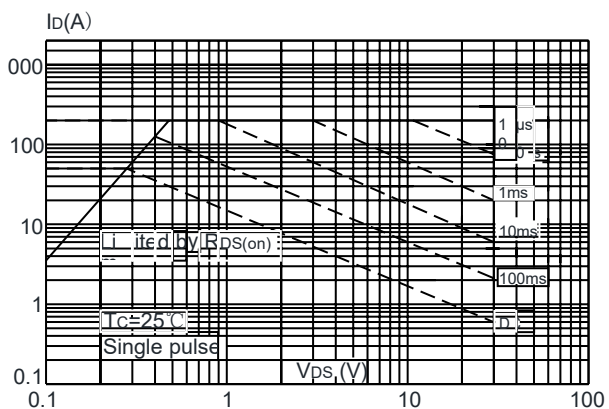


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

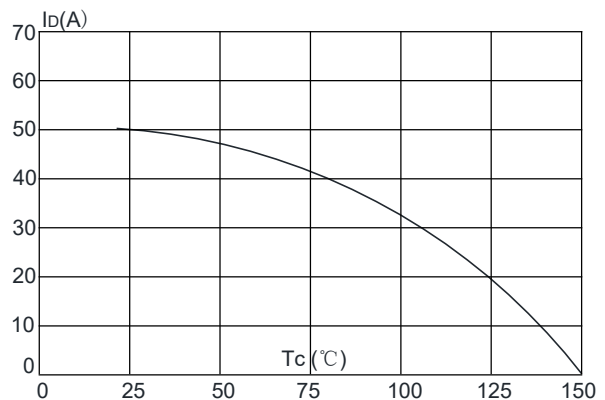
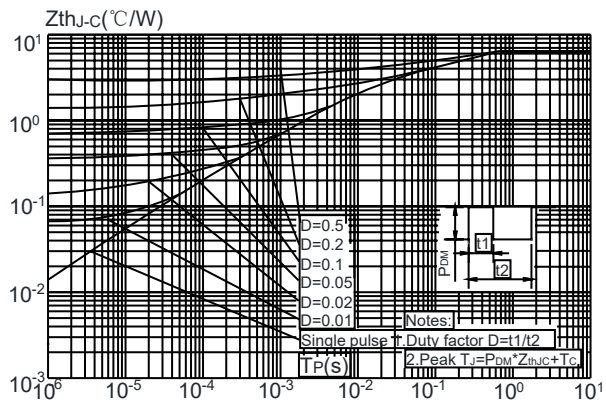


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case (PDFN3.3*3.3-8L)



Test Circuit

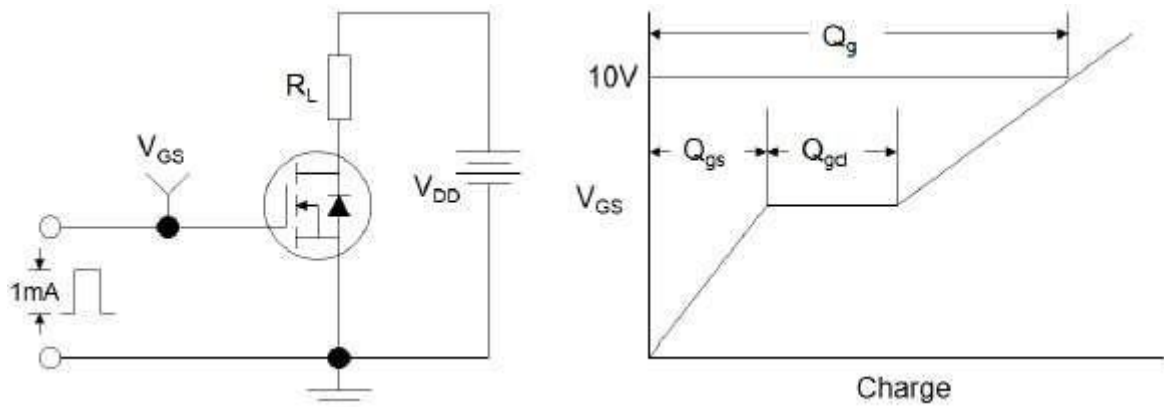


Figure1:Gate Charge Test Circuit & Waveform

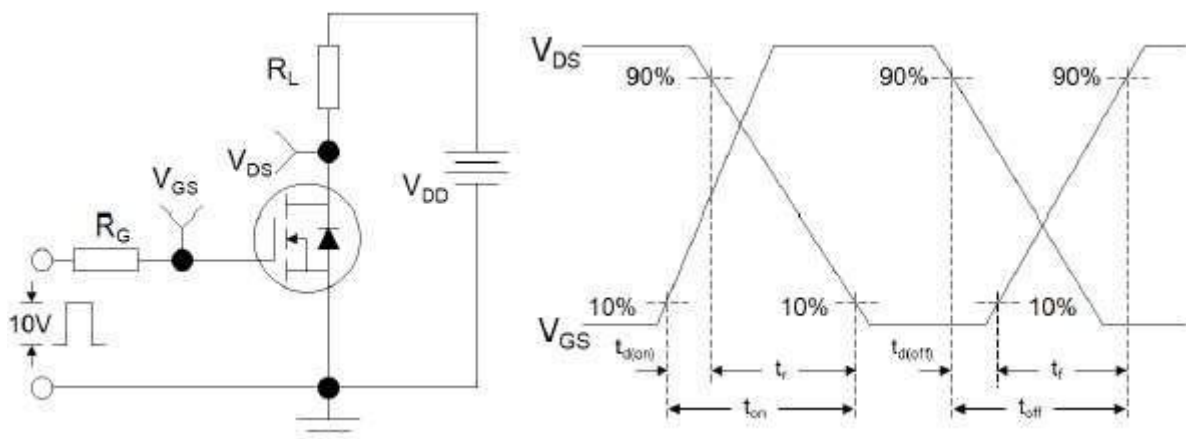


Figure 2: Resistive Switching Test Circuit & Waveforms

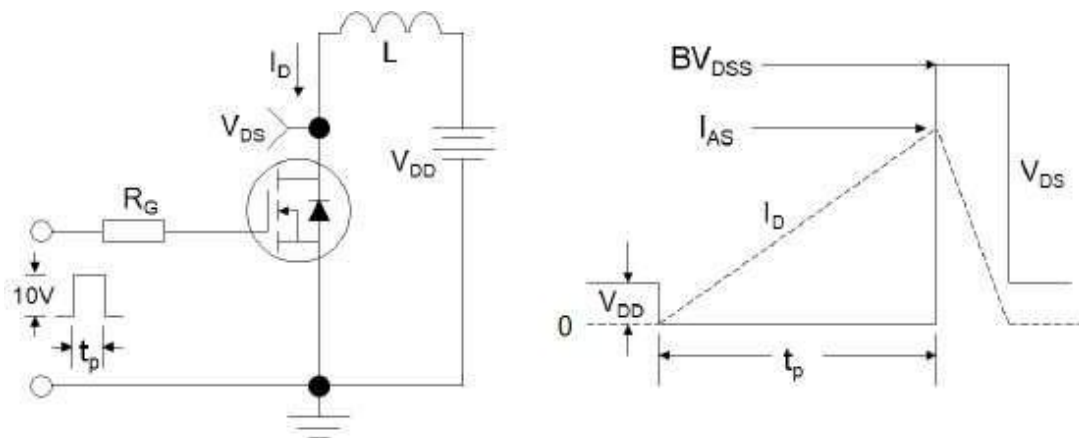


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms