10N10

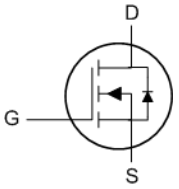
N-Ch 100V Fast Switching MOSFETs

Description

The 10N10 is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The 10N10 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

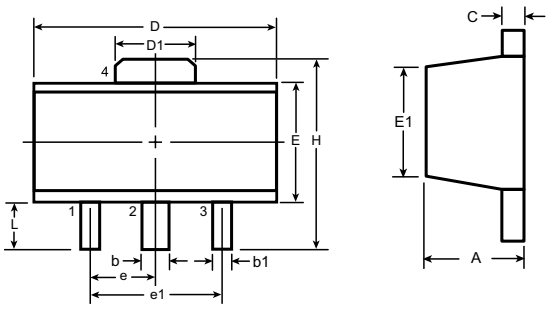
Super Low Gate Charge
Green Device Available
Excellent Cdv/dt effect decline
Advanced high cell density Trench technology



Product Summary

BVDSS	RDSON	ID
100V	85mΩ	10 A

SOT-89 PACKAGE OUTLINE



Top View　　Side View

Symbol		A	b	b1	C	D	D1	E	E1	e	e1	H	L
Dimensions (mm)	MIN	1.40	0.44	0.36	0.3	4.40	1.50	2.29	2.00f	1.50 BSC	3.00 BSC	3.94	0.89
	NOM	-	-	-	-	-	-	-	-			-	-
	MAX	1.60	0.56	0.48	0.5	4.60	1.75	2.60	2.29			4.25	1.20

Dimensions in mm

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	10	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	6.8	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	3	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	2.4	A
I_{DM}	Pulsed Drain Current[2]	20	A
EAS	Single Pulse Avalanche Energy[3]	6.1	mJ
I_{AS}	Avalanche Current	10	A
P_D@T_C=25℃	Total Power Dissipation[3]	30	W
P_D@T_A=25℃	Total Power Dissipation[3]	2	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	70	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	6.6	℃/W

10N10

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V, V_{GS}=0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	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=5A	-	85	110	mΩ
		V_{GS}=4.5V, I_D=3A	-	96	140	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	765	-	pF
C_{oss}	Output Capacitance		-	38	-	pF
C_{rss}	Reverse Transfer Capacitance		-	33	-	pF
Q_g	Total Gate Charge	V_{DS}=50V, I_D=2A, V_{GS}=10V	-	18	-	nC
Q_{gs}	Gate-Source Charge		-	2.5	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	4	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=50V, I_D=3A, R_G=1.8Ω, V_{GS}=10V	-	7.5	-	ns
t_r	Turn-on Rise Time		-	6	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	21	-	ns
t_f	Turn-off Fall Time		-	9	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=10A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=3A, dI/dt=100A/μs	-	21	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	22	-	nC

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

2. EAS condition : T_J=25℃,V_{DD}=30V,V_G=10V,L=0.5mH,Rg=25Ω,I_{AS}=4A

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

RATING AND CHARACTERISTIC CURVES (10N10)

Figure1: Output Characteristics

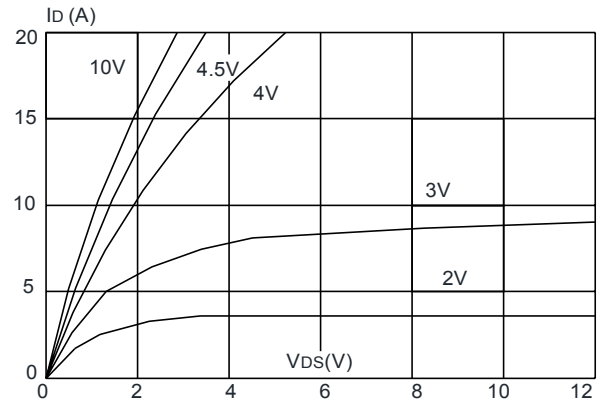


Figure 2: Typical Transfer Characteristics

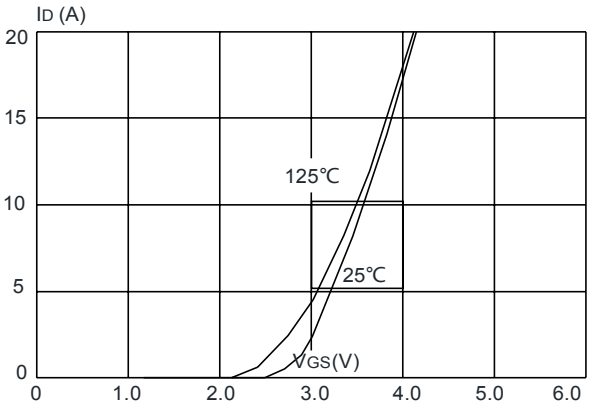


Figure 3: On-resistance vs. Drain Current

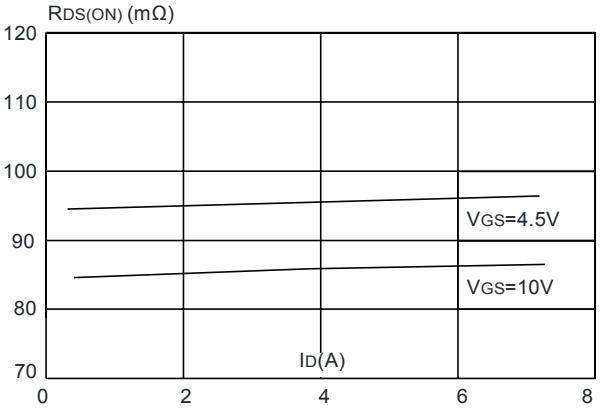


Figure 4 : Body Diode Characteristics

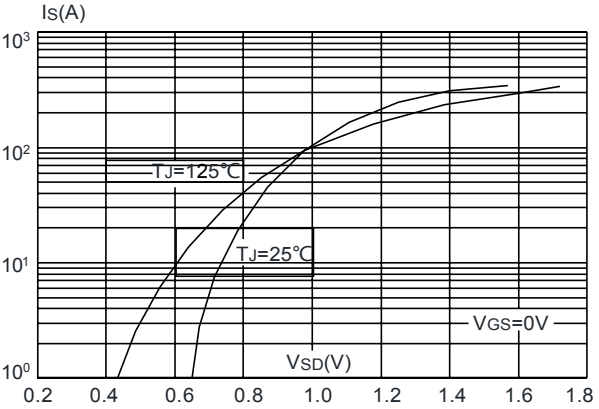


Figure 5: Gate Charge Characteristics

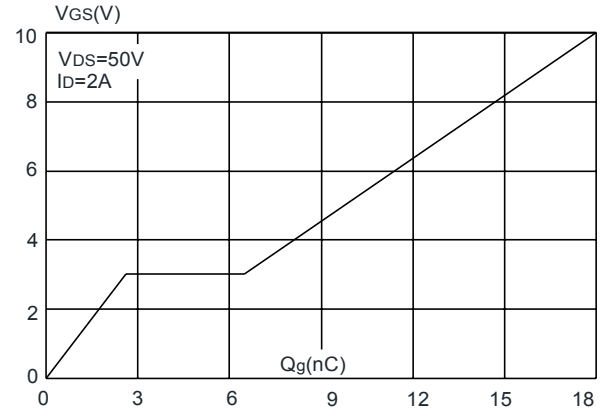
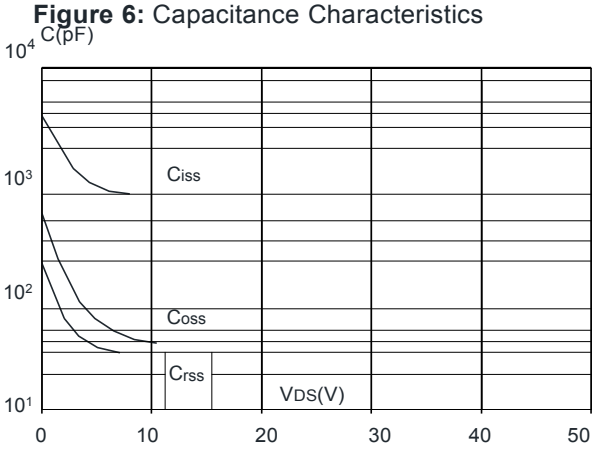


Figure 6: Capacitance Characteristics



RATING AND CHARACTERISTIC CURVES (10N10)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

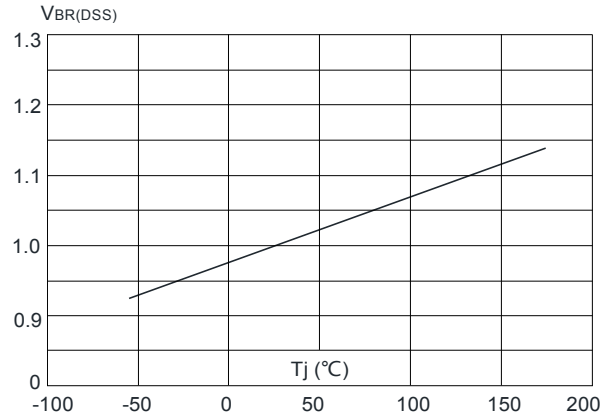


Figure 8: Normalized on Resistance vs. Junction Temperature

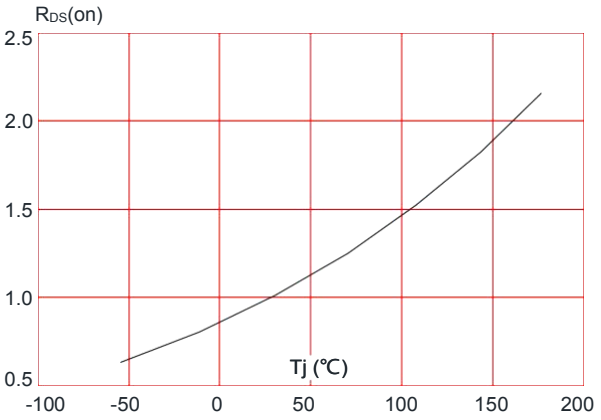


Figure 9: Maximum Safe Operating Area

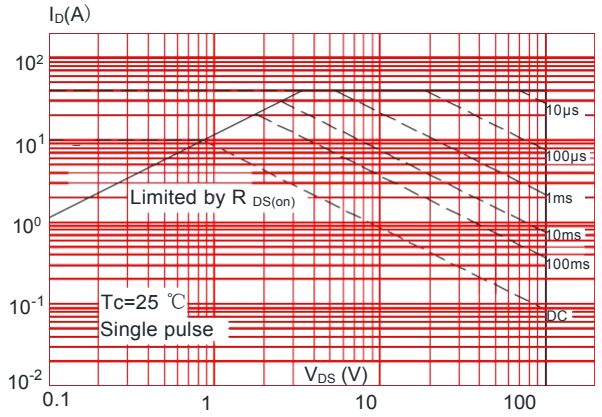


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

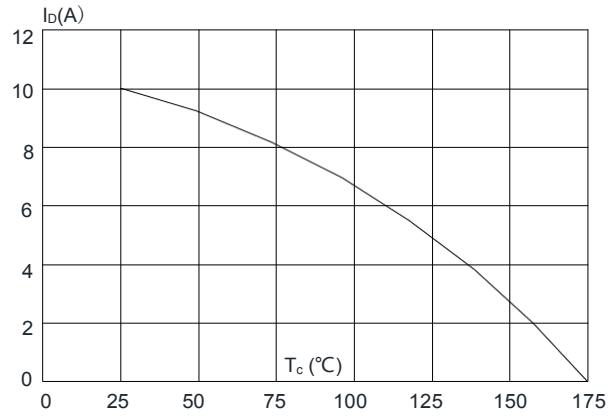


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case