

Features

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

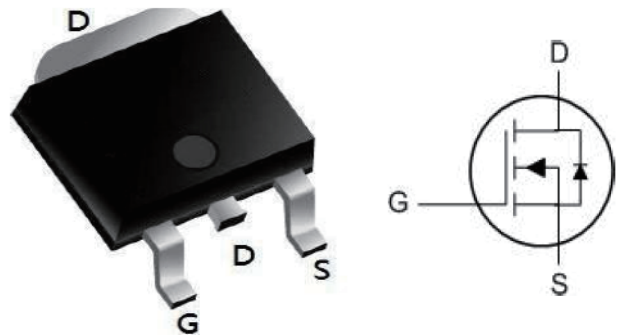
Product Summary

BVDSS	RDS(on)	ID
100V	32mΩ	30A

Description

The 30N10 is the highest performance trench Nc-h MOSFETs with extreme high cell density, which provide excellent RDS(on) and gate charge for most of the synchronous buck converter applications .
The 30N10 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

TO252 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	100	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current, V _{GS} @ 10V ¹	30	A
I _D @T _C =100°C	Continuous Drain Current, V _{GS} @ 10V ¹	15	A
I _{DM}	Pulsed Drain Current ²	80	A
EAS	Single Pulse Avalanche Energy ³	4.0	mJ
I _{AS}	Avalanche Current	30	A
P _D @T _C =25°C	Total Power Dissipation ³	43.7	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 _{θJA}	Thermal Resistance Junction-ambient ¹	---	50	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	3.0	°C/W

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

Symbol	Parameter	Test condition	Min.	Typ.	Max.	Units
Static Characteristics						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
I_{GSS}	Gate-body Leakage current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
I_{DSS}	Zero Gate Voltage Drain Current	$T_J = 25^\circ\text{C}$	-	-	1	μA
		$T_J = 100^\circ\text{C}$	-	-	100	
$V_{GS(th)}$	Gate-Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.2	-	2.5	V
$R_{DS(on)}$	Drain-Source on-Resistance ⁴	$V_{GS} = 10V, I_D = 5A$	-	32	45	m Ω
		$V_{GS} = 4.5V, I_D = 3A$	-	38	75	
g_{fs}	Forward Transconductance ⁴	$V_{DS} = 5V, I_D = 5A$	-	12	-	S
Dynamic Characteristics⁵						
C_{iss}	Input Capacitance	$V_{DS} = 15V, V_{GS} = 0V, f = 1\text{MHz}$	-	2420	-	pF
C_{oss}	Output Capacitance		-	99	-	
C_{rss}	Reverse Transfer Capacitance		-	84	-	
R_g	Gate Resistance	$f = 1\text{MHz}$	-	1.3	-	Ω
Switching Characteristics						
Q_g	Total Gate Charge	$V_{GS} = 10V, V_{DS} = 50V, I_D = 5A$	-	40.6	-	nC
Q_{gs}	Gate-Source Charge		-	8	-	
Q_{gd}	Gate-Drain Charge		-	6.7	-	
$t_{d(on)}$	Turn-On Delay Time	$V_{GS} = 10V, V_{DD} = 50V, R_G = 3\Omega, I_D = 5A$	-	8.7	-	ns
t_r	Rise Time		-	41	-	
$t_{d(off)}$	Turn-Off Delay Time		-	40	-	
t_f	Fall Time		-	32	-	
Drain-Source Body Diode Characteristics						
V_{SD}	Diode Forward Voltage ⁴	$I_S = 1A, V_{GS} = 0V$	-	-	1.2	V
I_S	Continuous Source Current	$TC = 25^\circ\text{C}$	-	-	30	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_J(\text{MAX}) = 150^\circ\text{C}$.
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 $V_{DD} = 25V, V_{GS} = 10V, L = 0.1\text{mH}, I_{AS} = 8A$.
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 Electrical and Thermal Characteristics (Curves)

Figure 1: Output Characteristics

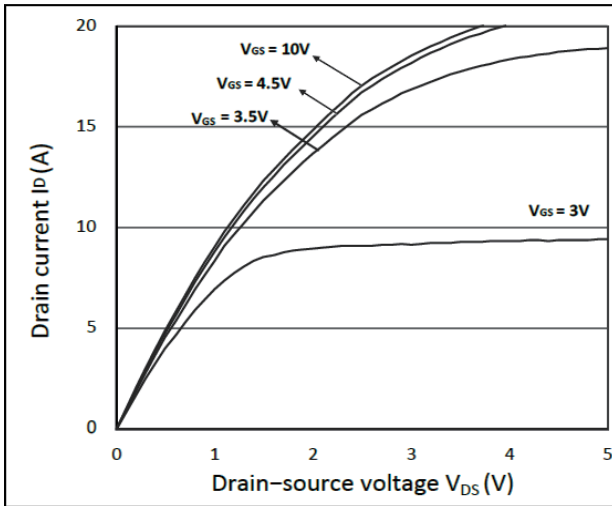


Figure 2: Typical Transfer Characteristics

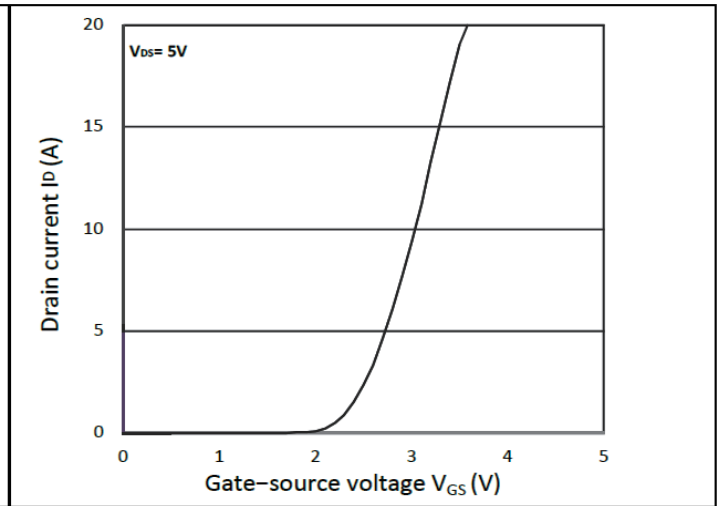


Figure 3: Forward Characteristics of Reverse

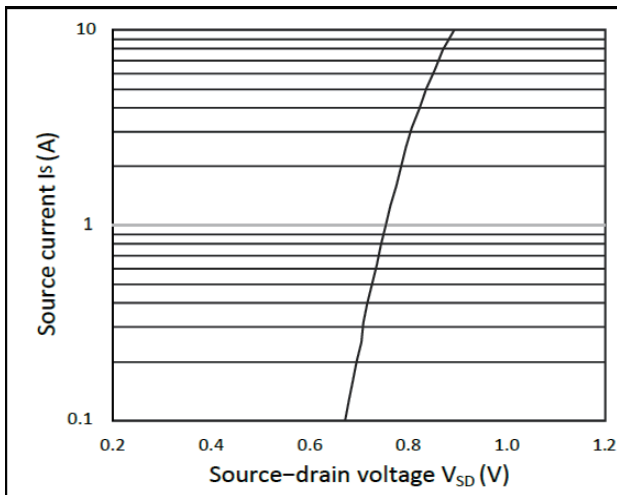


Figure 4: RDS(ON) vs. VGS

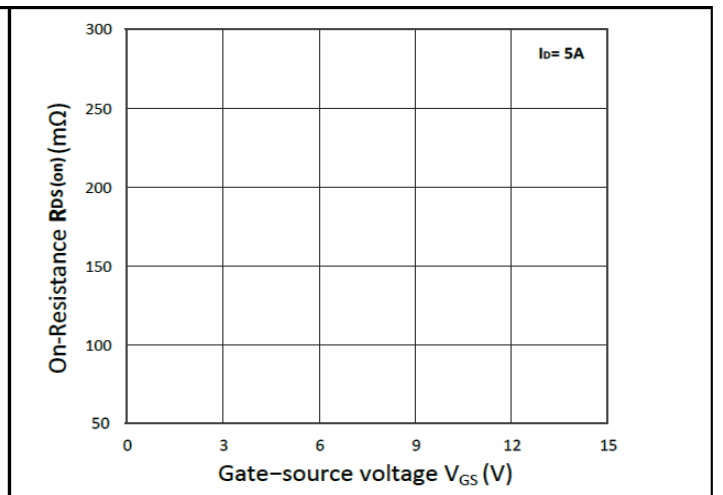


Figure 5: RDS(ON) vs. ID

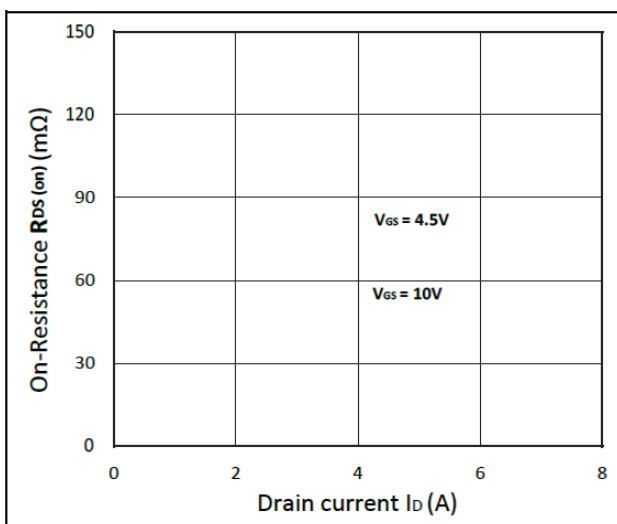
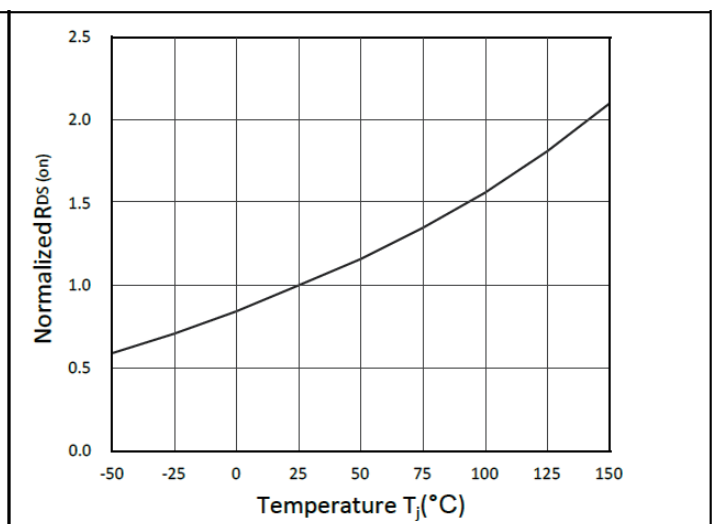


Figure 6: Normalized RDS(on) vs. Temperature



Typical Performance Characteristics

Figure 7: Capacitance Characteristics

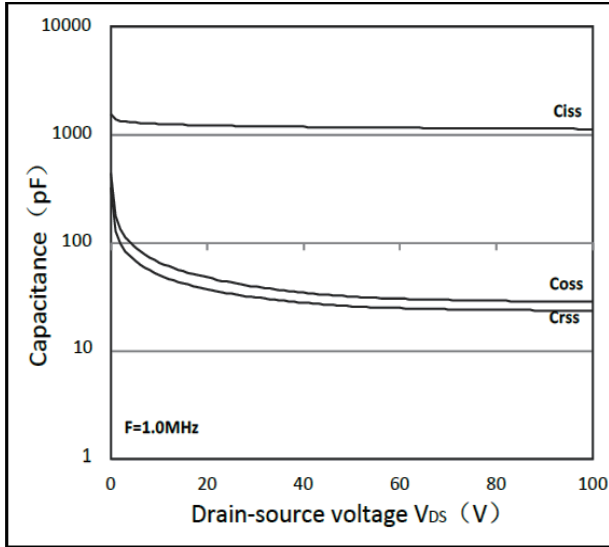


Figure 8: Gate Charge Characteristics

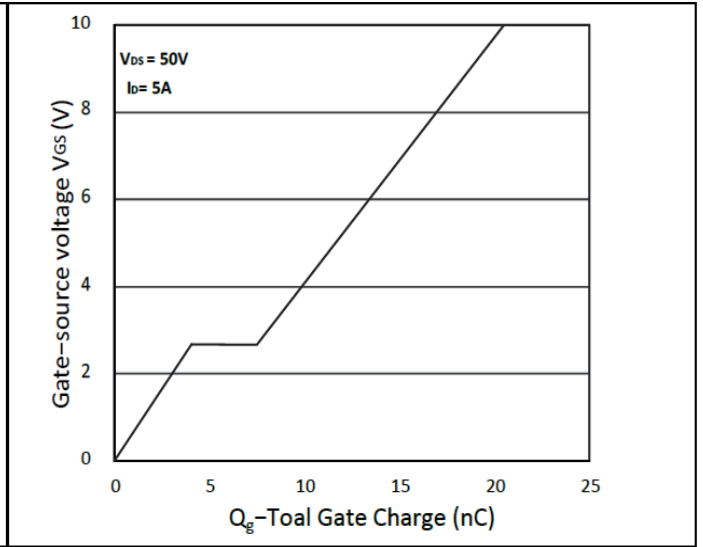


Figure 9: Power Dissipation

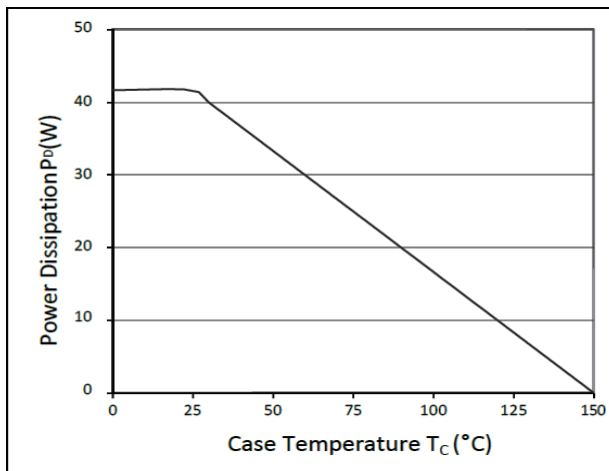


Figure 10: Safe Operating Area

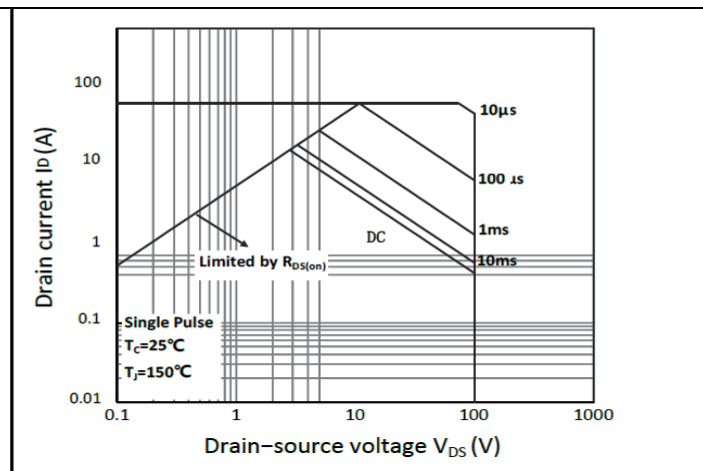
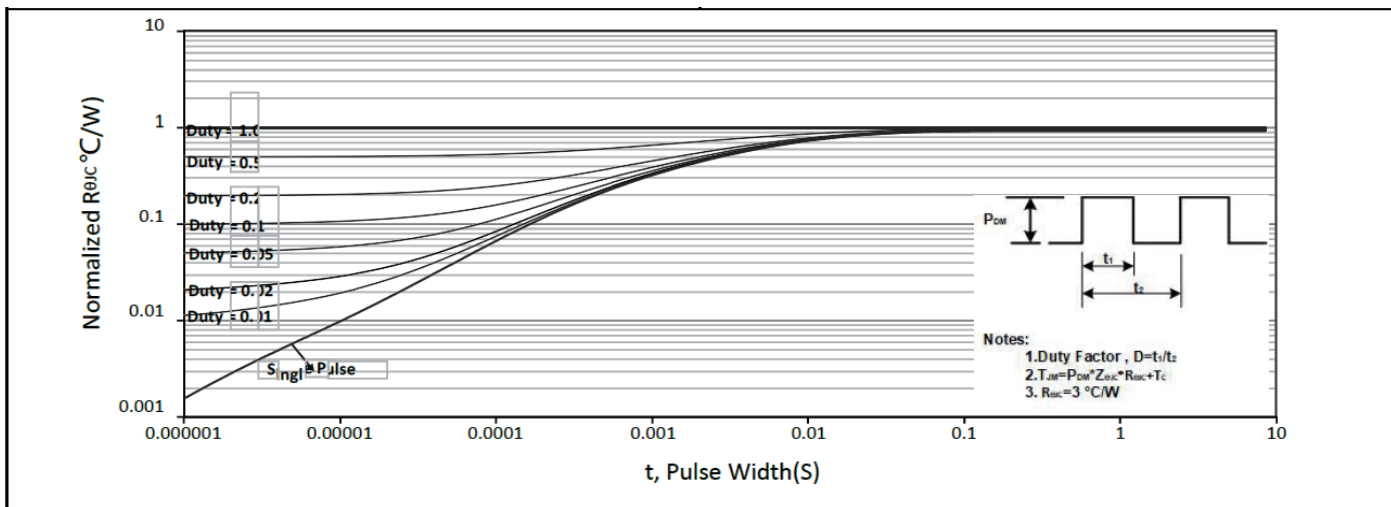
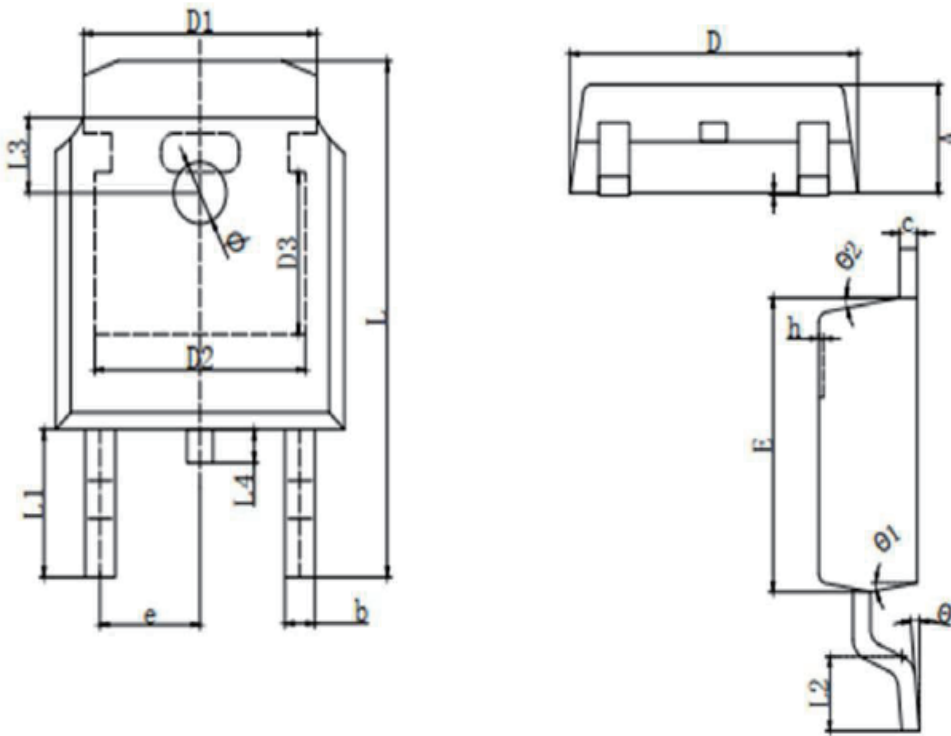


Figure 11: Normalized Maximum Transient Thermal Impedance



TO-252 Package outline



Symbol	MILLMETER		Symbol	MILLMETER	
	MIN	MAX		MIN	MAX
A	2.200	2.400	h	0.000	0.200
A1	0.000	0.127	L	9.900	10.30
b	0.640	0.740	L1	2.888REF	
c	0.460	0.580	L2	1.400	1.700
D	6.500	6.700	L3	1.600REF	
D1	5.334REF		L4	0.600	1.000
D2	4.826REF		\varnothing	1.100	1.300
D3	3.166REF		θ	0°	8°
E	6.00	6.200	θ_1	9° TYP2	
e	2.286TYP		θ_2	9° TYP	