Features

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

Product Summary

RoHS

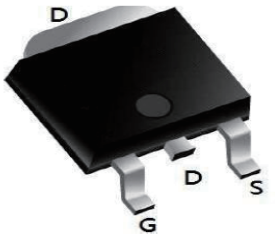
BVDSS	RDSON	ID
100V	65mΩ	20A

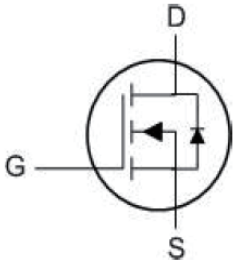
Description

The 20N10 is the highest performance trench Nc-h MOSFETs with extreme high cell density, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications .

The 20N10 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]	20	A
I_D@T_C=100°C	Continuous Drain Current, V_{GS} @ 10V[1]	12	A
I_{DM}	Pulsed Drain Current[2]	20	A
EAS	Single Pulse Avalanche Energy[3]	4.1	mJ
I_{AS}	Avalanche Current	10	A
P_D@T_C=25°C	Total Power Dissipation[3]	41.7	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
$R_{\theta JA}$	Thermal Resistance Junction-ambient [1]	---	50	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case [1]	---	3.0	°C/W

Electrical Characteristics (T_J =25 °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 = 250μA	100	-	-	V
I_{GSS}	Gate-body Leakage current		V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
I_{DSS}	Zero Gate Voltage Drain Current	T_J=25°C	V_{DS} =100V, V_{GS} = 0V	-	-	1	μA
		T_J=100°C		-	-	100	
$V_{GS(th)}$	Gate-Threshold Voltage		V_{DS} = V_{GS}, I_D = 250μA	1.2	-	2.5	V
$R_{DS(on)}$	Drain-Source on-Resistance[4]		V_{GS} = 10V, I_D = 5A	-	65	90	mΩ
			V_{GS} = 4.5V, I_D = 3A	-	75	105	
g_{fs}	Forward Transconductance [4]		V_{DS}=5V , I_D=5A	-	12	-	S
Dynamic Characteristics [5]							
C_{iss}	Input Capacitance		V_{DS} = 15V, V_{GS} =0V,f =1MHz	-	1220	-	pF
C_{oss}	Output Capacitance			-	53	-	
C_{rss}	Reverse Transfer Capacitance			-	42	-	
R_g	Gate Resistance		f =1MHz	-	1.3	-	Ω
Switching Characteristics[5]							
Q_g	Total Gate Charge		V_{GS} = 10V, V_{DS} = 50V, I_D=5A	-	20.6	-	nC
Q_{gs}	Gate-Source Charge			-	4	-	
Q_{gd}	Gate-Drain Charge			-	3.7	-	
$t_{d(on)}$	Turn-On Delay Time		V_{GS} =10V, V_{DD} =50V, R_G = 3Ω, I_D= 5A	-	4.7	-	ns
t_r	Rise Time			-	21	-	
$t_{d(off)}$	Turn-Off Delay Time			-	20	-	
t_f	Fall Time			-	16	-	
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°C	-	-	-	30	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature TJ(MAX)=150°C.

2.The data tested by pulsed , pulse width ⩽ 300us , duty cycle ⩽ 2%

3.The EAS data shows Max. rating . The test condition is VDD=25V,VGS=10V,L=0.1mH,IAS=8A.

4.The power dissipation is limited by 150°C junction temperature.

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

Typical Electrical and Thermal Characteristics (Curves)

Figure1: Output Characteristics

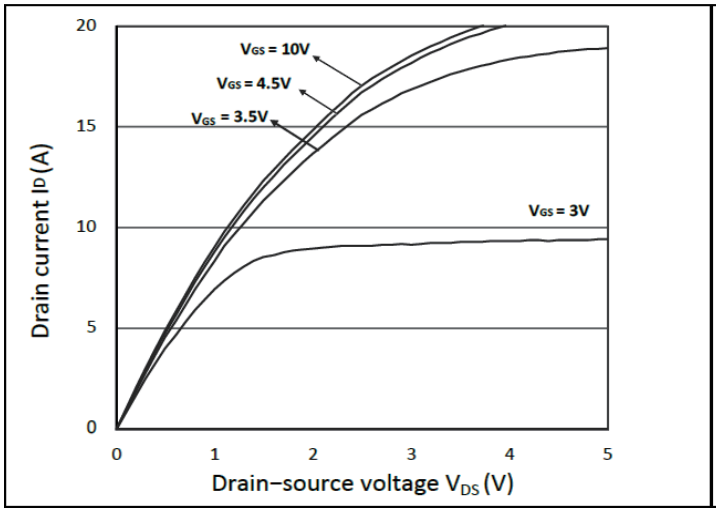


Figure 2: Typical Transfer Characteristics

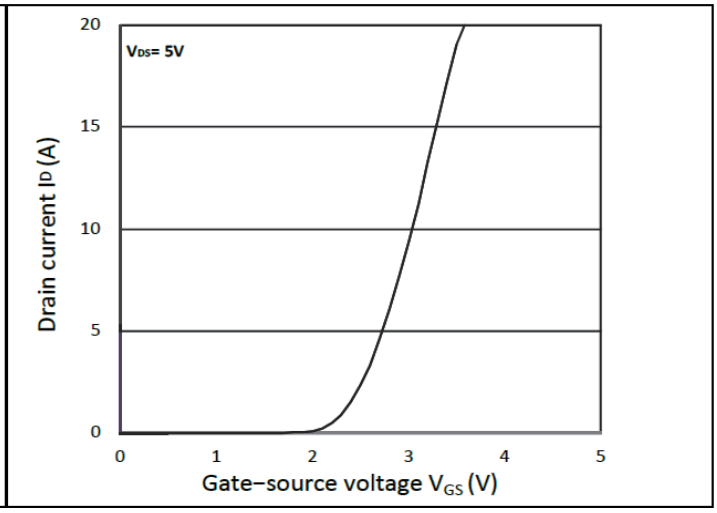


Figure 3:Forward Characteristics of Rever

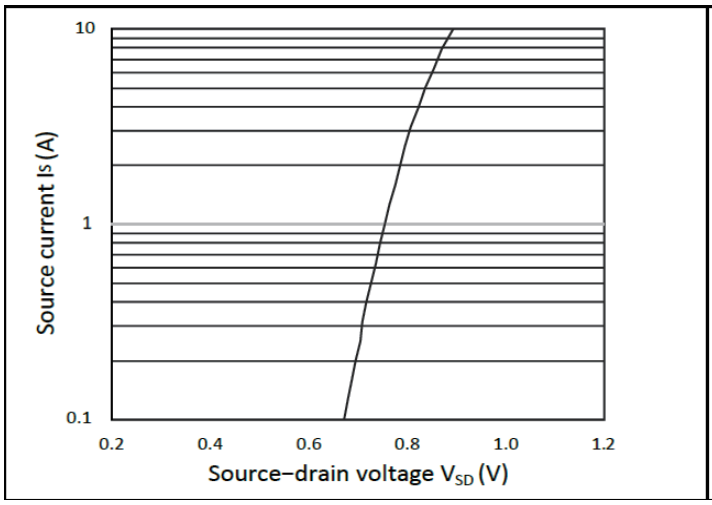


Figure 4: RDS(ON) vs. VGS

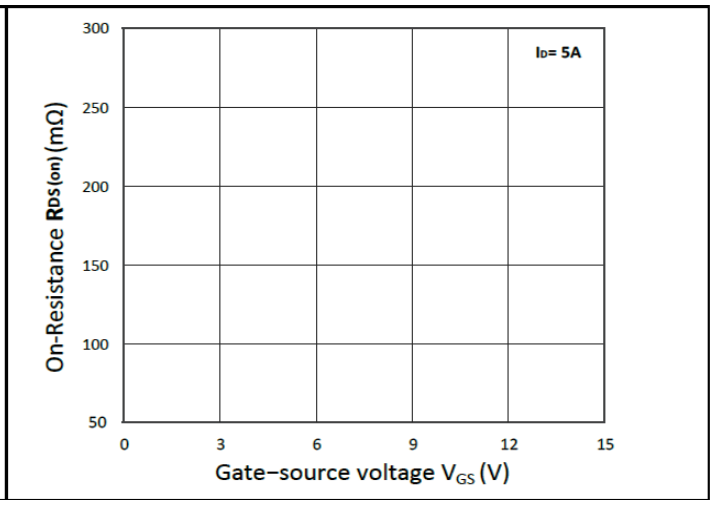


Figure 5: RDS(ON) vs. ID

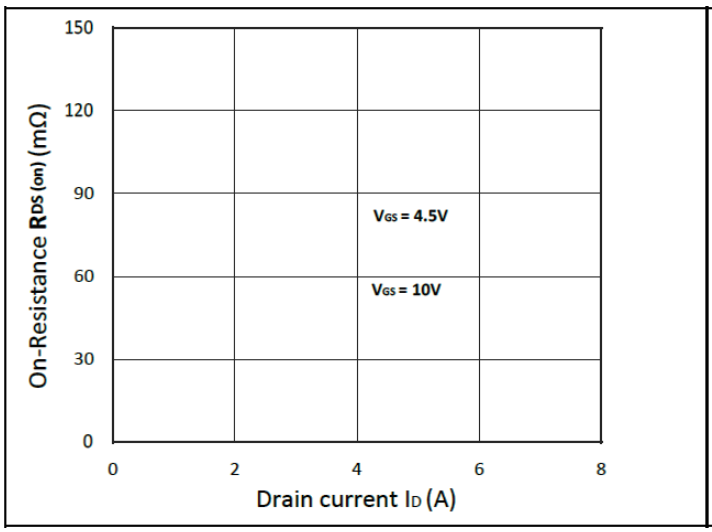
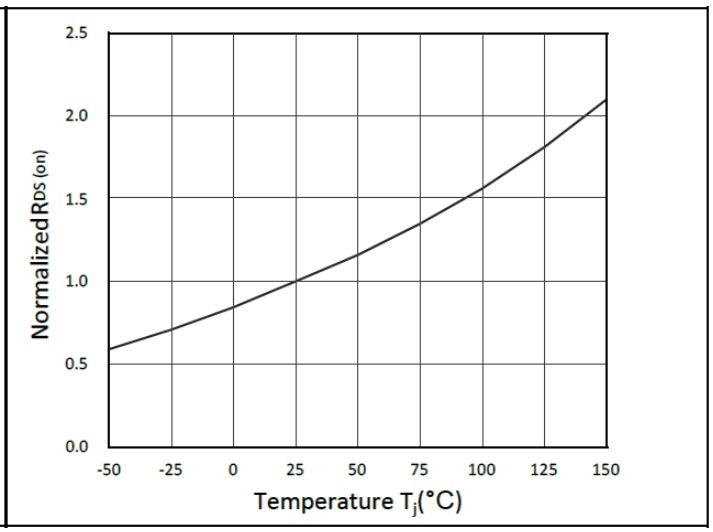


Figure 6:Normalized RDS(on) vs. Tempe



Typical Performance Characteristics

Figure 7:Capacitance Characteristics

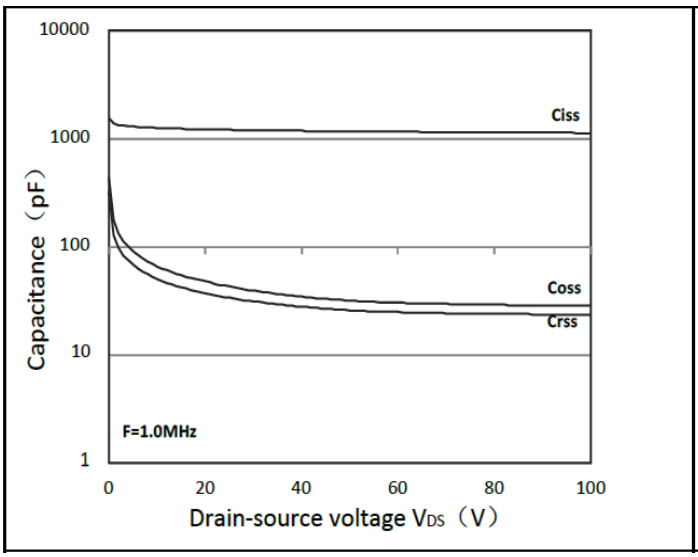


Figure 8:Gate Charge Characteristics

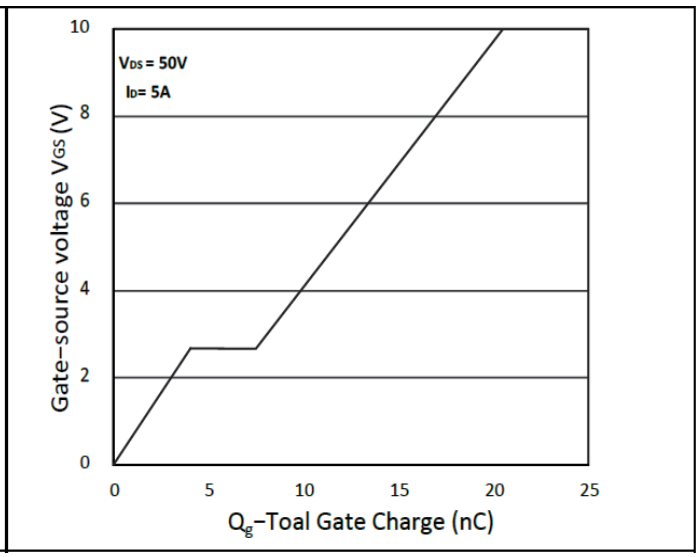


Figure 9:Power Dissipation

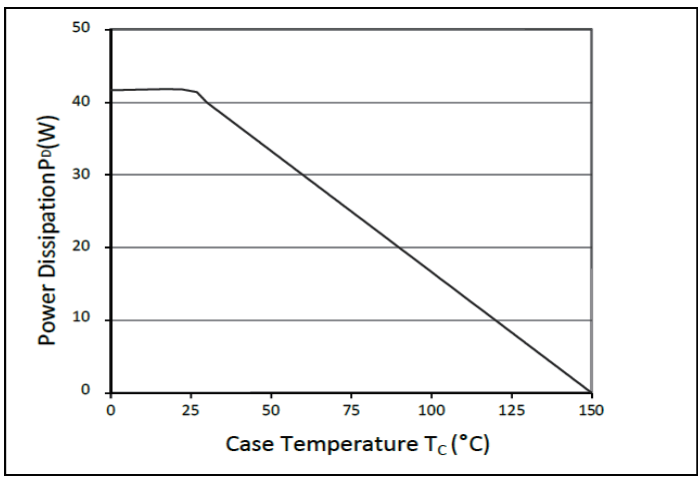


Figure 10:Safe Operating Area

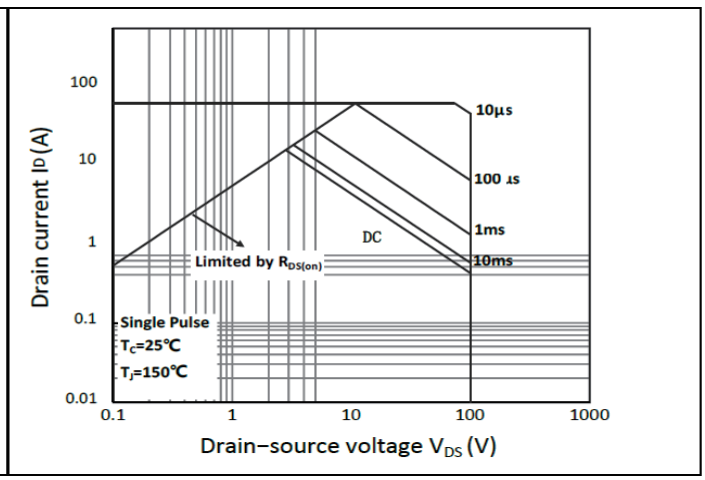
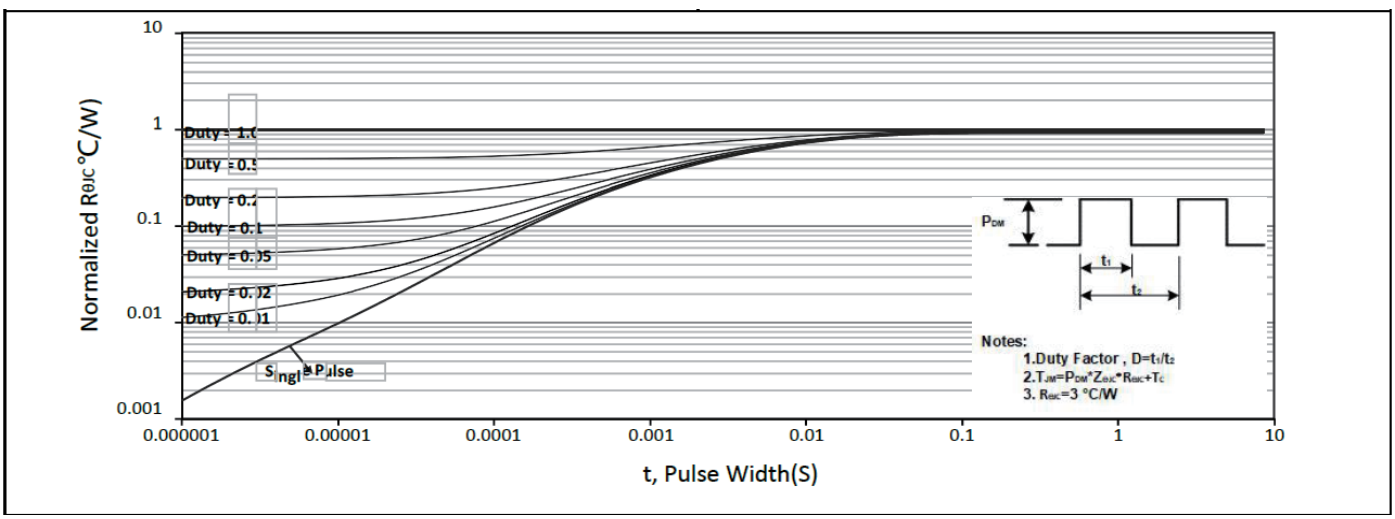
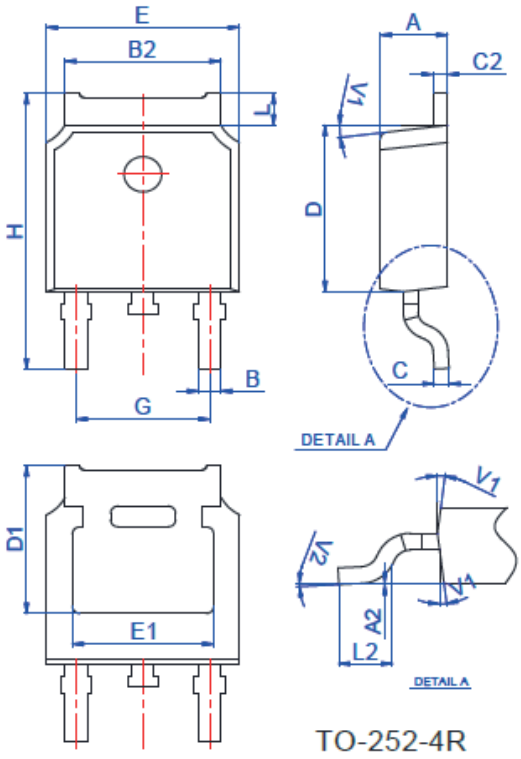


Figure 11:Normalized Maximum Transien



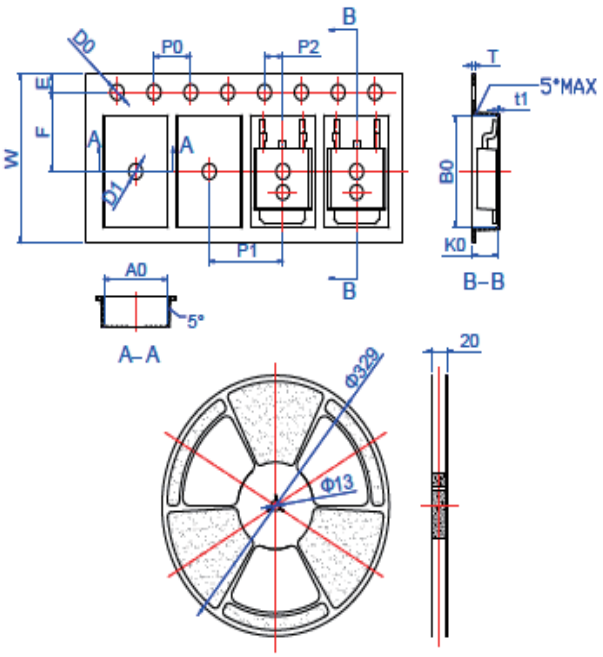
TO-252 Package outline



TO-252-4R

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°

TO-252 Package outline



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.40	1.50	1.60	0.055	0.059	0.063
D1	1.40	1.50	1.60	0.055	0.059	0.063
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
A0	6.85	6.90	7.00	0.270	0.271	0.276
B0	10.45	10.50	10.60	0.411	0.413	0.417
K0	2.68	2.78	2.88	0.105	0.109	0.113
T	0.24		0.27	0.009		0.011
t1	0.10			0.004		
10P0	39.80	40.00	40.20	1.567	1.575	1.583

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