

## Features

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

## Product Summary

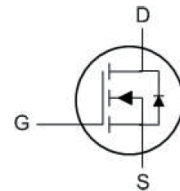
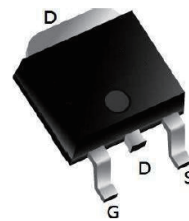
BVDSS	RDSON	ID
100V	85mΩ	15A

## Description

The 15N10 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 15N10 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## TO252 Pin Configuration



## Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	100	V
V <sub>GS</sub>	Gate-Source Voltage	±20	V
I <sub>D</sub> @T <sub>C</sub> =25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	15	A
I <sub>D</sub> @T <sub>C</sub> =100°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	8	A
I <sub>D</sub> @T <sub>A</sub> =25°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	3	A
I <sub>D</sub> @T <sub>A</sub> =70°C	Continuous Drain Current, V <sub>GS</sub> @ 10V <sup>1</sup>	2.4	A
I <sub>DM</sub>	Pulsed Drain Current <sup>2</sup>	20	A
EAS	Single Pulse Avalanche Energy <sup>3</sup>	6.1	mJ
I <sub>AS</sub>	Avalanche Current	10	A
P <sub>D</sub> @T <sub>C</sub> =25°C	Total Power Dissipation <sup>3</sup>	30	W
P <sub>D</sub> @T <sub>A</sub> =25°C	Total Power Dissipation <sup>3</sup>	2	W
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction-ambient <sup>1</sup>	---	62	°C/W
R <sub>θJC</sub>	Thermal Resistance Junction-Case <sup>1</sup>	---	6.6	°C/W

**Electrical Characteristics (T<sub>J</sub> =25 °C unless otherwise specified)**

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V,	-	-	1	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1	1.5	2.5	V
R <sub>DS(on)</sub> <small>note3</small>	Static Drain-Source on-Resistance	V <sub>GS</sub> =10V, I <sub>D</sub> =5A	-	85	110	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	-	96	140	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0MHz	-	765	-	pF
C <sub>oss</sub>	Output Capacitance		-	38	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	33	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, I <sub>D</sub> =2A, V <sub>GS</sub> =10V	-	18	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	2.5	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	4	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =50V, I <sub>D</sub> =3A, R <sub>G</sub> =1.8Ω, V <sub>GS</sub> =10V	-	7.5	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	6	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	21	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	9	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	40	A
V <sub>SD</sub>	Drain to Source Diode Forward	V <sub>GS</sub> =0V, I <sub>S</sub> =10A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =3A, dI/dt=100A/μs	-	21	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery		-	22	-	nC

**Notes:**

- 1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2.EAS condition : T<sub>J</sub>=25°C,V<sub>DD</sub>=30V,V<sub>G</sub>=10V,L=0.5mH,R<sub>G</sub>=25Ω,I<sub>AS</sub>=4A
- 3.Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤0.5%

Typical Electrical and Thermal Characteristics (Curves)

Figure 1: Output Characteristics

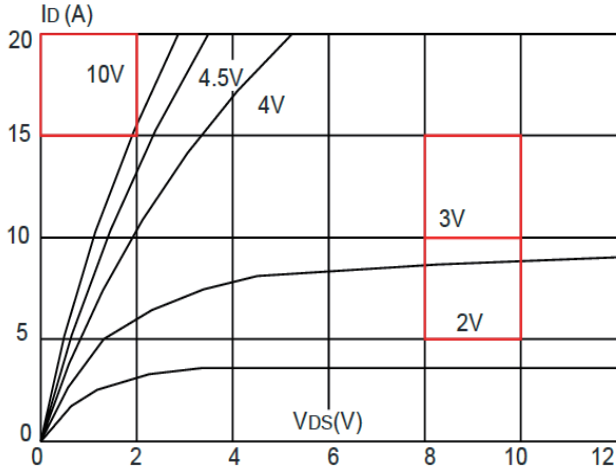


Figure 2: Typical Transfer Characteristics

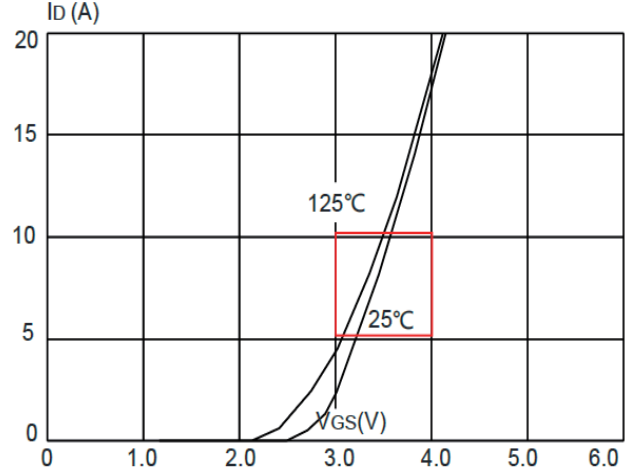


Figure 3: On-resistance vs. Drain Current

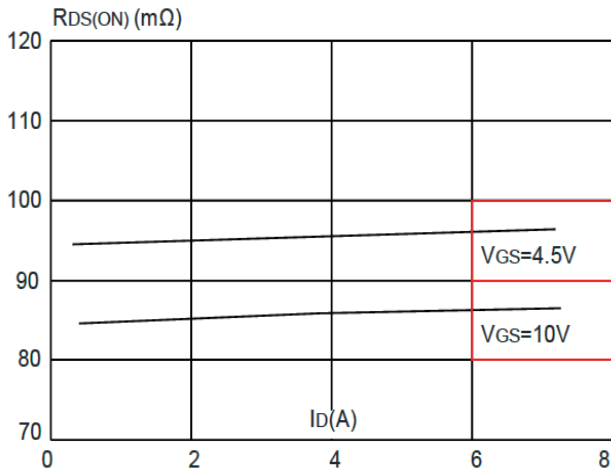


Figure 4: Body Diode Characteristics

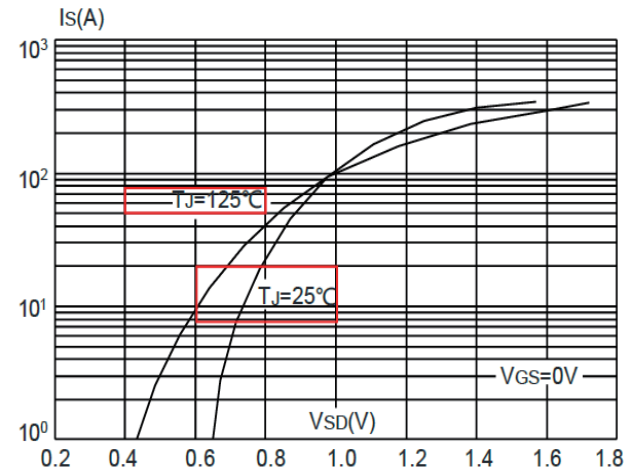


Figure 5: Gate Charge Characteristics

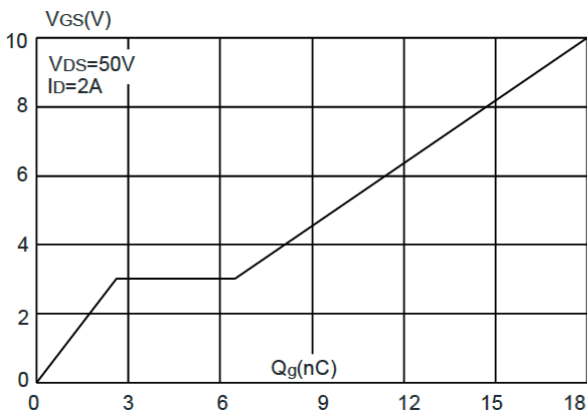
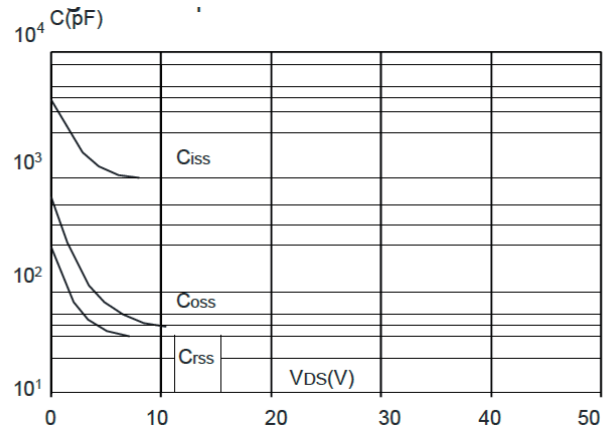


Figure 6: Capacitance Characteristics



## Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

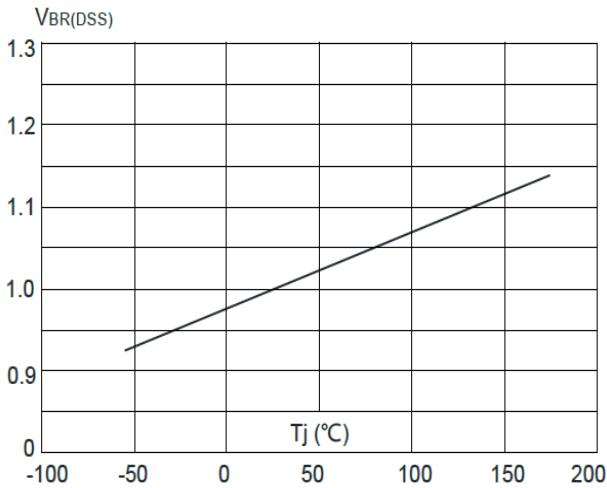


Figure 8: Normalized on Resistance vs. Junction Temperature

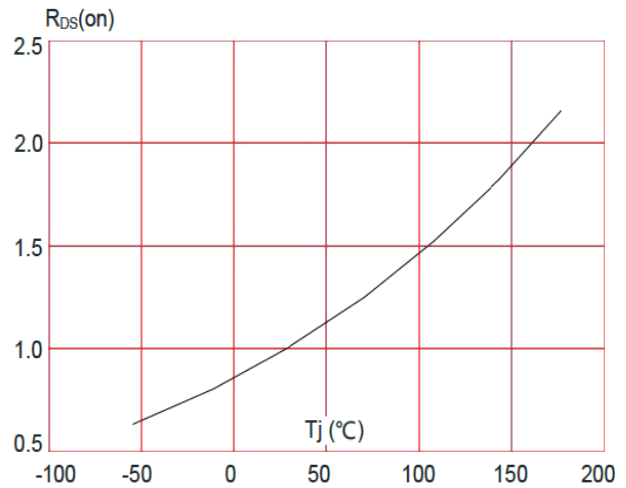


Figure 9: Maximum Safe Operating Area

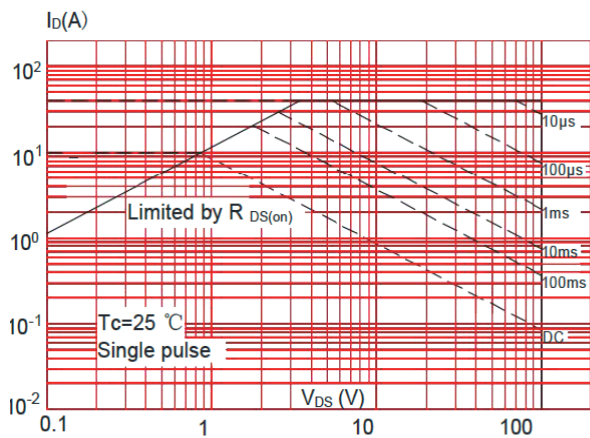


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

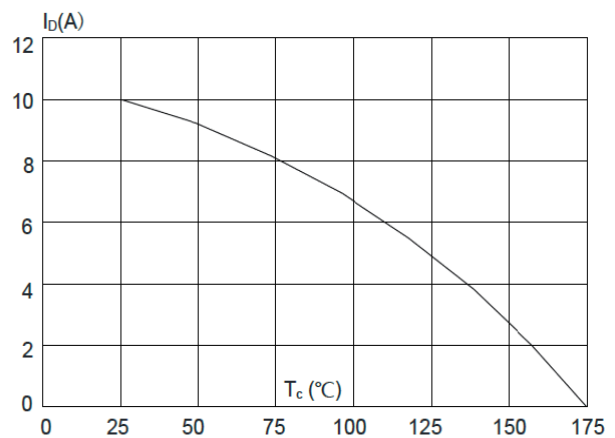
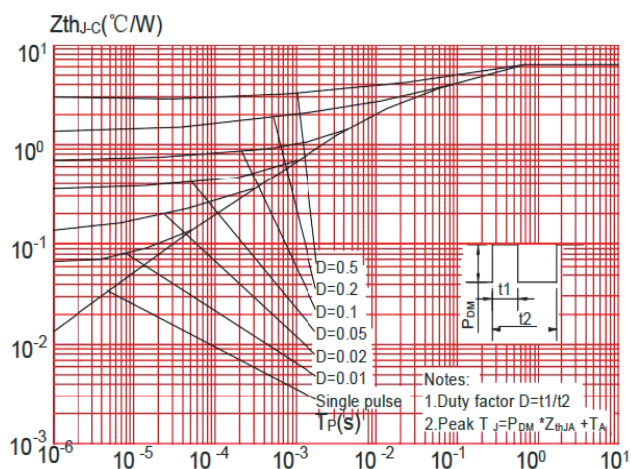
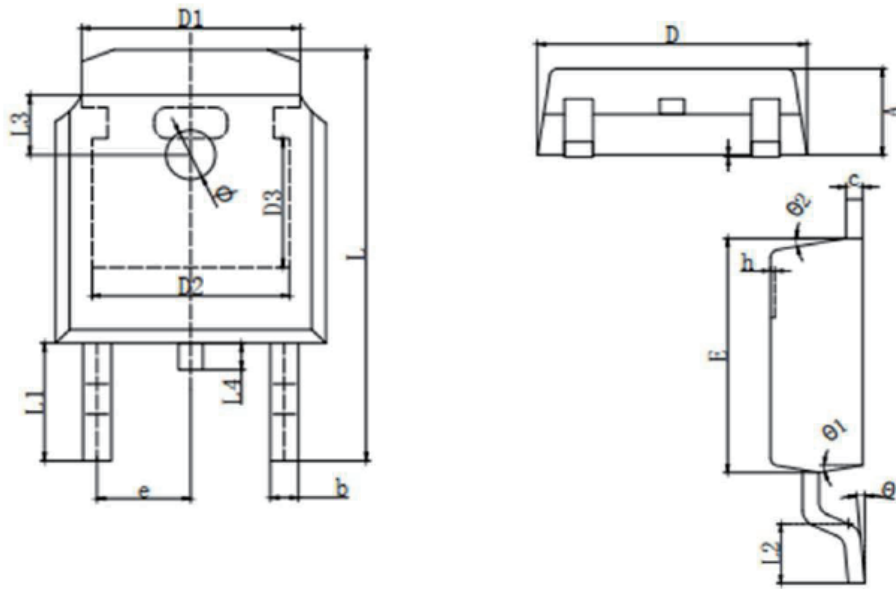


Figure 11 Maximum Effective Transient Thermal Impedance Junction to Case



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		∅	1.100	1.300
D3	3.166REF		θ	0°	8°
E	6.00	6.200	θ <sub>1</sub>	9° TYP2	
e	2.286TYP		θ <sub>2</sub>	9° TYP	

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