BORN SEMICONDUCTOR

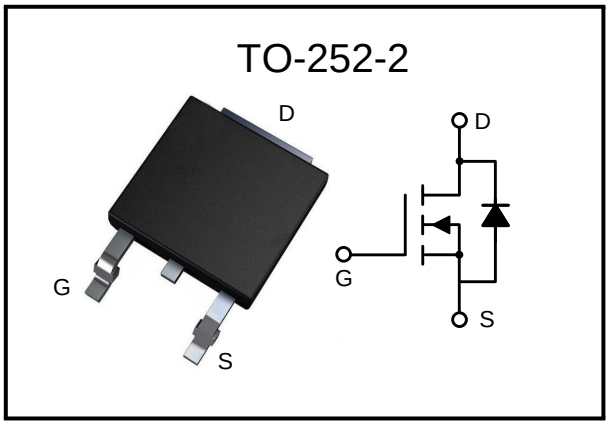
BNT15N10

N-Channel MOSFET

Features

- $V_{BR(DSS)}$=100V
- I_D=15A
- $R_{DS(ON)}$@10V,TYP=88mΩ
- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance

Package



Application

- Power Switching Application
- SMPS 2nd Synchronous Rectifier
- MB/VGA Vcore
- Lighting

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Symbol	Parameter		Value	Units
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate - Source Voltage		±20	
I_D	Drain Current	T_C=25°C	15	A
		T_C=100°C	8.5	
		T_A=25°C	5	
I_{DM}	Drain Current-Pulse(1)		60	A
I_{AS}	Single Pulsed Avalanche Current		12.5	A
E_{AS}	Single Pulsed Avalanche Energy		16	mJ
P_D	Power Dissipation	T_C=25°C	34.5	W
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient		50	°C/W
$R_{\theta JC}$	Thermal Resistance From Junction to Case		3.6	°C/W
T_J	Junction Temperature		150	°C
T_{stg}	Storage Temperature Range		-55 to +150	°C

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Electrical Characteristics (T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D=250uA	100	–	–	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS}=0V	–	–	1	uA
Gate-Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS}=0V	–	–	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D=250uA	1.0	1.5	2.5	V
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=12A	–	88	110	mΩ
		V_{GS}=4.5V, I_D=8A	–	96	140	mΩ
Forward Transconductance	g_{fs}	V_{DS}=5V, I_D=4.5A	–	13	–	S
Dynamic Characteristics						
Input capacitance	C_{iss}	V_{DS} =25V,	–	890	–	pF
Output capacitance	C_{oss}	V_{GS} =0V,	–	60	–	
Reverse transfer capacitance	C_{rss}	f = 1MHz	–	25	–	
Static Drain-source On Resistance	R_g	V_{GS}=V_{DS}=0V, f=1MHz	–	1.5	–	Ω
Switching Characteristics						
Turn-on delay time	$T_{d(on)}$	V_{DD}=25V,	–	14.2	–	nS
Turn-on Rise time	T_r	V_{GS}=10V,	–	33.7	–	
Turn -Off Delay Time	$T_{d(off)}$	R_G =1Ω,	–	40.2	–	
Turn -Off Fall time	T_f	R_L =5Ω	–	6	–	
Gate to Drain Charge	Q_g	V_{DS}=80V,	–	24	–	nC
Gate to Source Charge	Q_{gs}	V_{GS}=10V,	–	5	–	
Gate to Drain Charge	Q_{gd}	I_D=10A	–	8	–	
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_S=1A	–	–	1.2	V
Continuous Source Current	I_S	–	–	12	–	A
Pulsed Sourse Current	I_{SM}		–	24	–	
Reverse Recovery Time	T_{rr}	I_F=4.5A, d_{IF}/d_t=500A/μs	–	21	–	ns
Reverse Recovery Charge	Q_{rr}		–	27.3	–	nC

Notes:

(1) Pulse Test: Pulse Width ≤300μs, duty cycle ≤1.5%, Starting T_J= 25°C.

Typical Characteristics

Figure 1 : Typical Output Characteristics

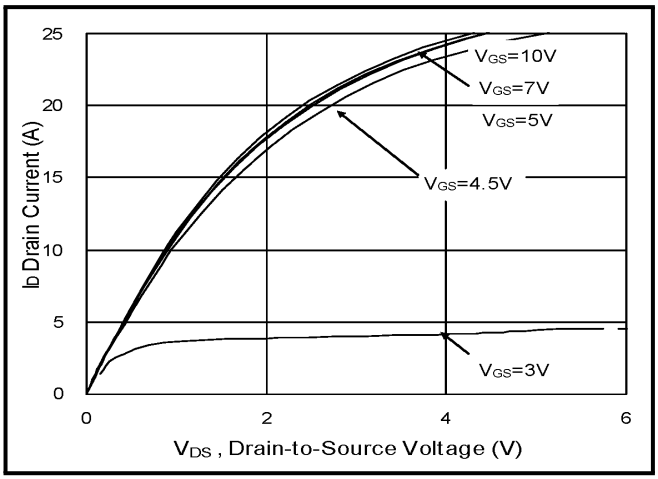


Figure 2 : On-Resistance vs. Gate-Source

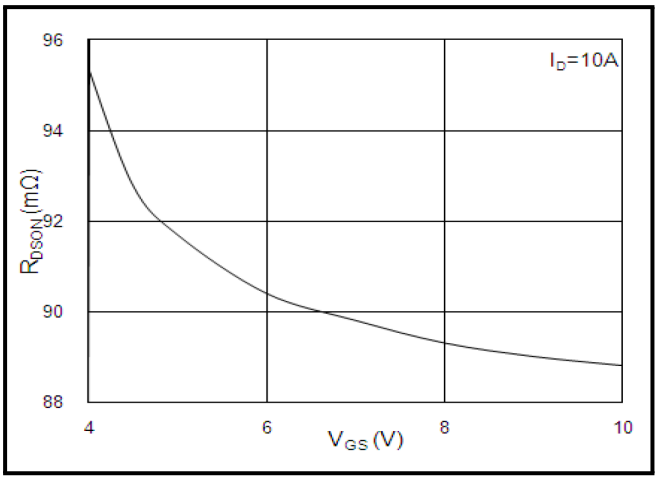


Figure 3 : Forward Characteristics Of Reverse

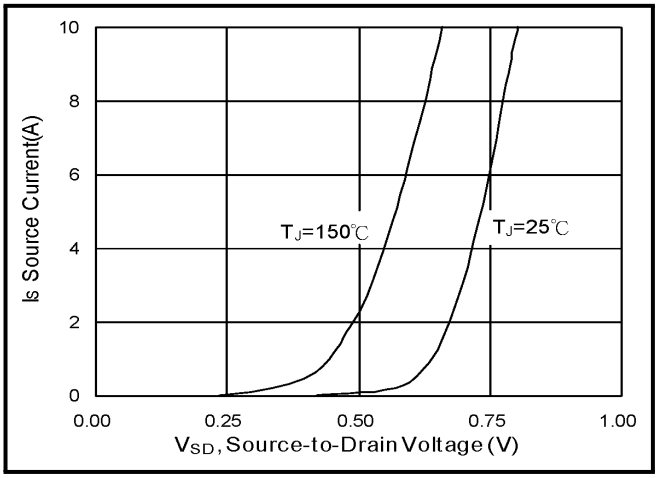


Figure 4 : Gate-Charge Characteristics

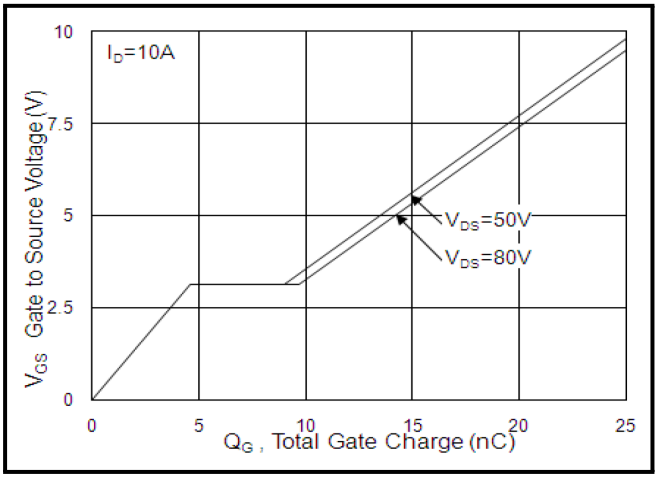


Figure 5 : Normalized VGS(th) vs. TJ

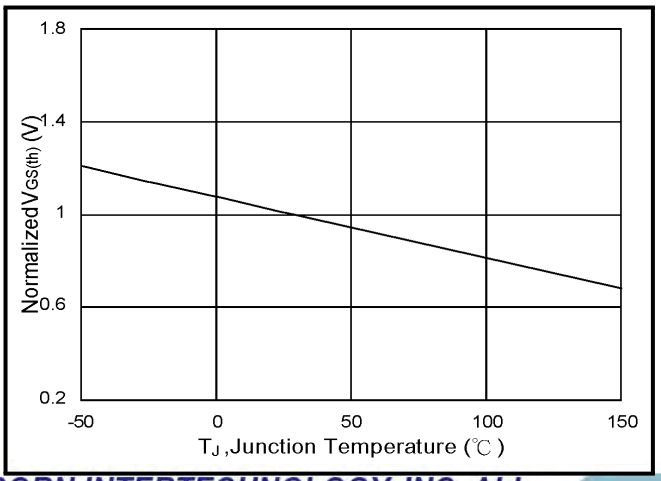
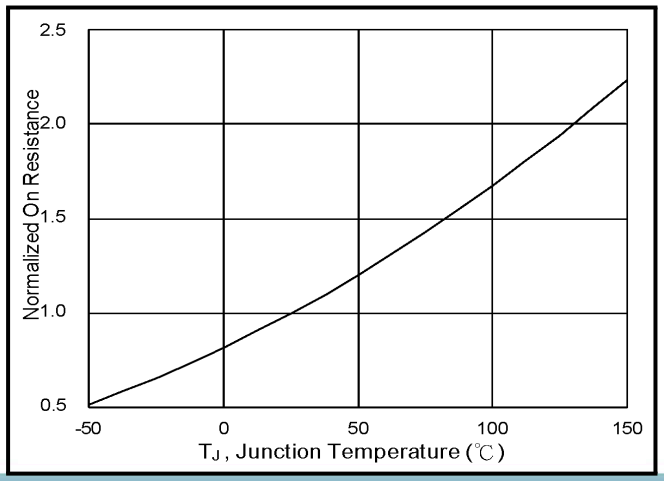


Figure 6 : Normalized RDSON vs. TJ



Typical Characteristics

Figure 7 : Capacitance

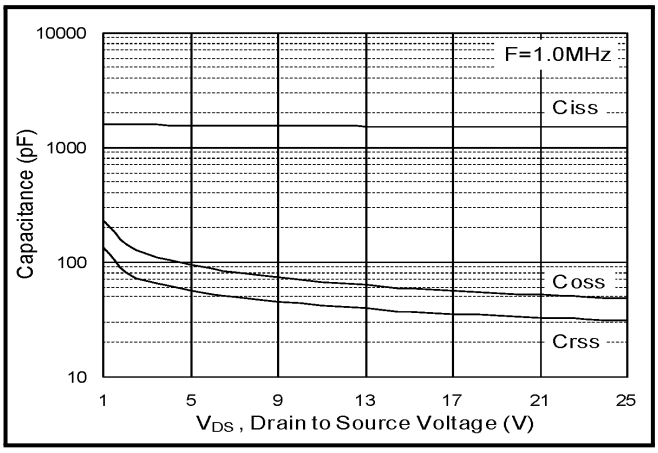


Figure 8 : Safe Operating Area

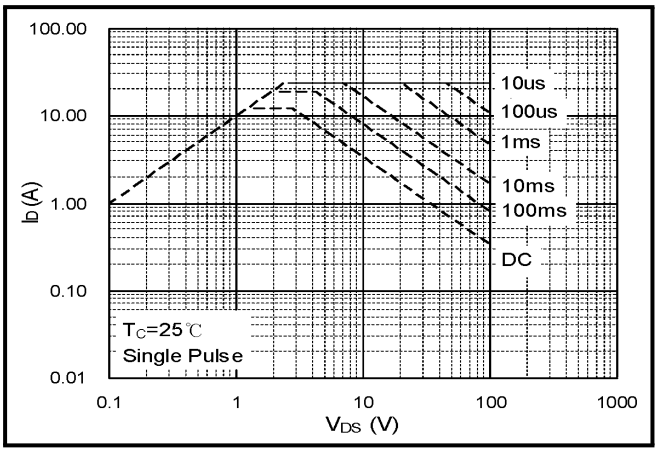
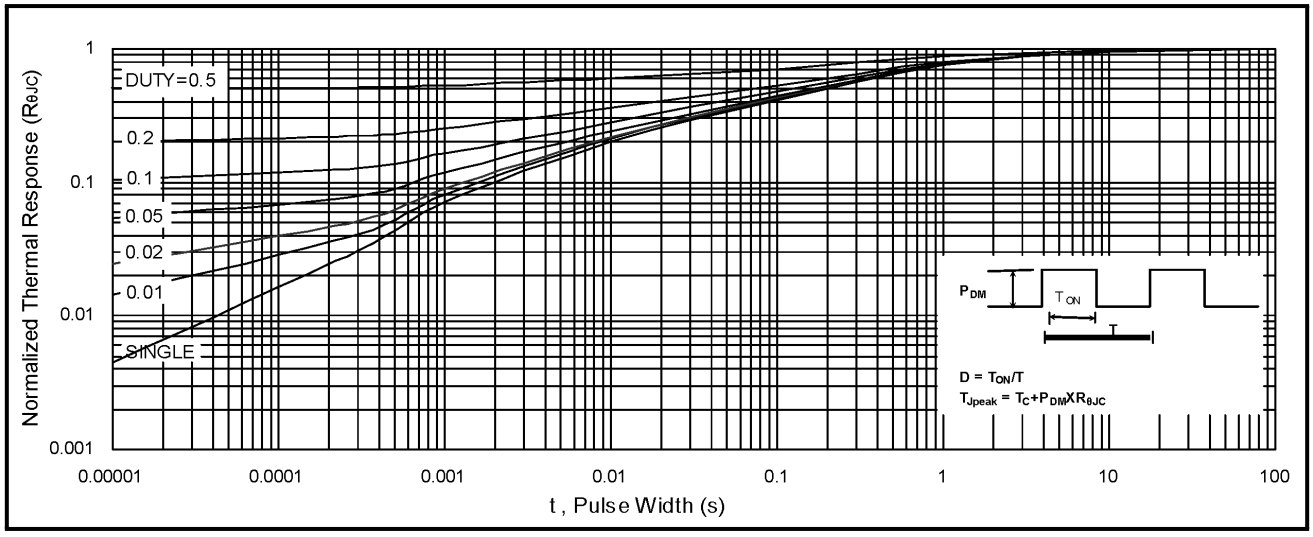


Figure 9 : Normalized Maximum Transient Thermal Impedance



Test Circuit

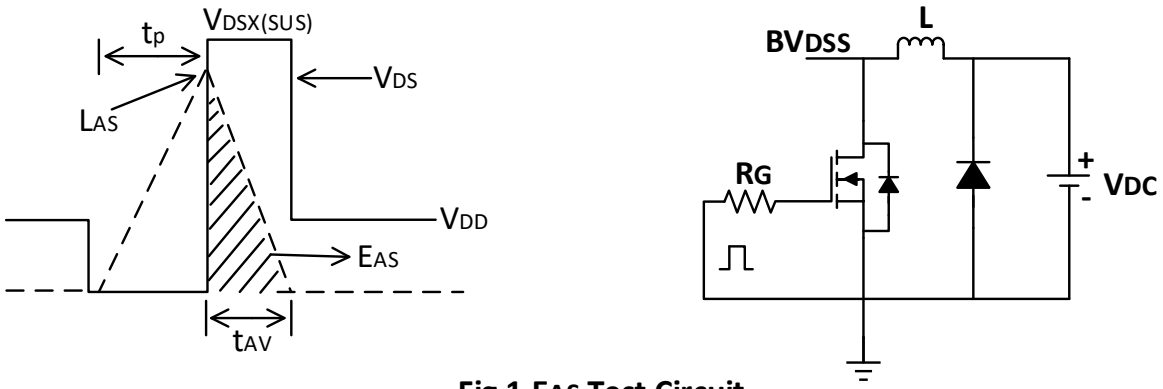


Fig 1.EAS Test Circuit

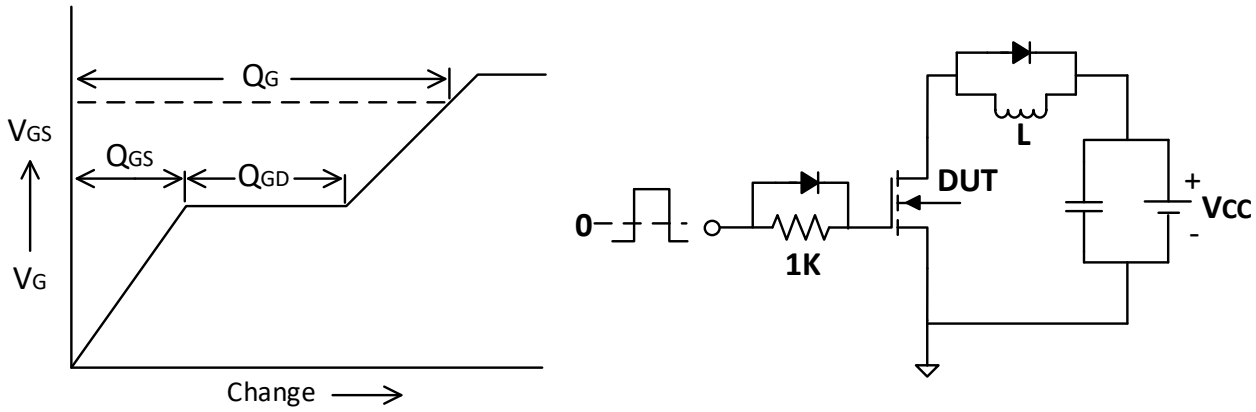


Fig 2.Gate Charge Test Circuit

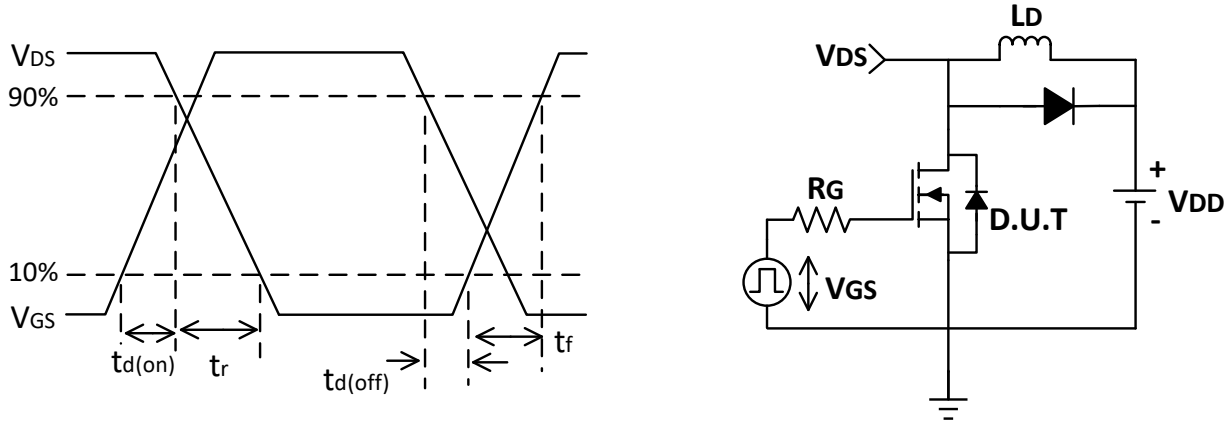


Fig 3 . Switch Time Test Circuit

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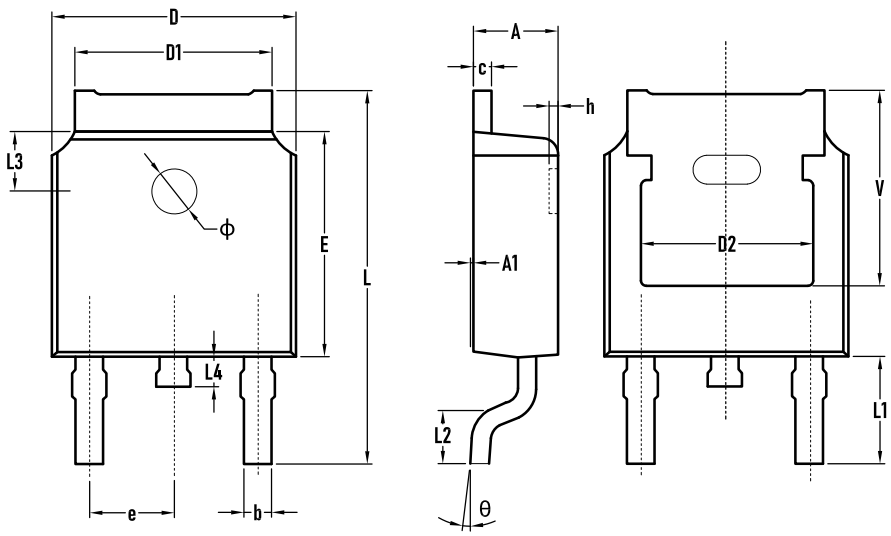

SYMBOL	Millimeters		Inches	
	MIN.	MAX.	MIN.	MAX.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
ϕ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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