

General Description

The MY011BNC uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

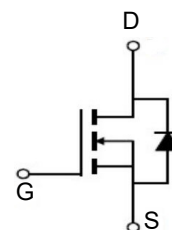
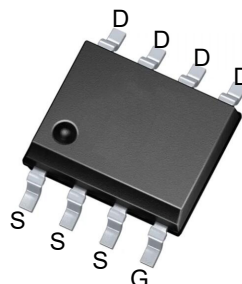


Features

V_{DSS}	20	V
I_D	12	A
$P_D(T_C=25^{\circ}C)$	20.8	W
$R_{DS(ON)}(at V_{GS}=10V)$	<11	m Ω

Application

- Battery protection
- Load switch
- Uninterruptible power supply



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
MY011BNC	SOP-8	011CN	3000

Absolute Maximum Ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
$I_{D@T_C=25^{\circ}C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	12	A
$I_{D@T_C=100^{\circ}C}$	Continuous Drain Current, $V_{GS} @ 10V^1$	10	A
I_{DM}	Pulsed Drain Current ²	50	A
E_{AS}	Single Pulse Avalanche Energy ³	8.1	mJ
I_{AS}	Avalanche Current	12.7	A
$P_{D@T_C=25^{\circ}C}$	Total Power Dissipation ⁴	20.8	W
$P_{D@T_A=25^{\circ}C}$	Total Power Dissipation ⁴	2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^{\circ}C$
T_J	Operating Junction Temperature Range	-55 to 150	$^{\circ}C$
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	62	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	6	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.023	---	V/ $^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V$, $I_D=10A$	---	8	11	m Ω
		$V_{GS}=4.5V$, $I_D=8A$	---	10	13	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.5	0.7	0.9	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	-4.2	---	mV/ $^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=24V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	uA
		$V_{DS}=24V$, $V_{GS}=0V$, $T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V$, $V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V$, $I_D=10A$	---	5.5	---	S
R_g	Gate Resistance	$V_{DS}=0V$, $V_{GS}=0V$, $f=1MHz$	---	2.3	---	Ω
Q_g	Total Gate Charge (4.5V)	$V_{DS}=15V$, $V_{GS}=4.5V$, $I_D=10A$	---	4.9	---	nC
Q_{gs}	Gate-Source Charge		---	1.66	---	
Q_{gd}	Gate-Drain Charge		---	1.85	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=15V$, $V_{GS}=10V$, $R_G=3.3$ $I_D=10A$	---	1.6	---	ns
T_r	Rise Time		---	15.8	---	
$T_{d(off)}$	Turn-Off Delay Time		---	13	---	
T_f	Fall Time		---	4.8	---	
C_{iss}	Input Capacitance	$V_{DS}=15V$, $V_{GS}=0V$, $f=1MHz$	---	2295	---	pF
C_{oss}	Output Capacitance		---	260	---	
C_{rss}	Reverse Transfer Capacitance		---	200	---	
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	24	A
I_{SM}	Pulsed Source Current ^{2,5}		---	---	50	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=10A$, $dI/dt=100A/\mu s$, $T_J=25^\circ\text{C}$	---	8.7	---	nS
Q_{rr}	Reverse Recovery Charge		---	1.95	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2.The data tested by pulsed , pulse width .The EAS data shows Max. rating .
- 3.he test condition is $V_{GS} \leq 300\mu s$, duty cycle $\frac{t_{on}}{t_{on}+t_{off}} \leq 25\%$, $V_{GS}=10V$, $L=0.1mH$, $I_{AS}=12.7A$
- 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 Characteristics

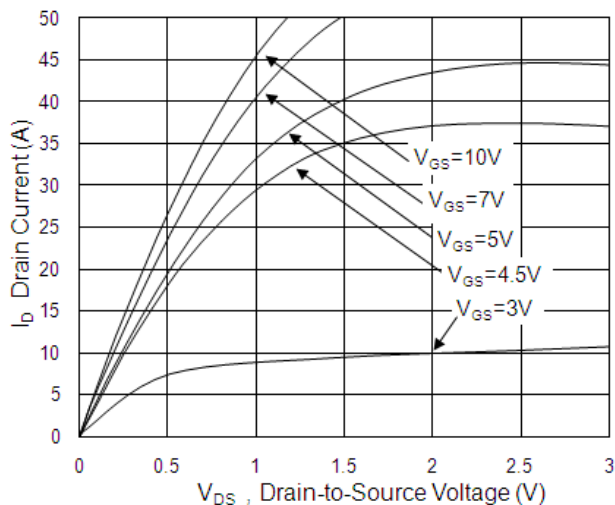


Fig.1 Typical Output Characteristics

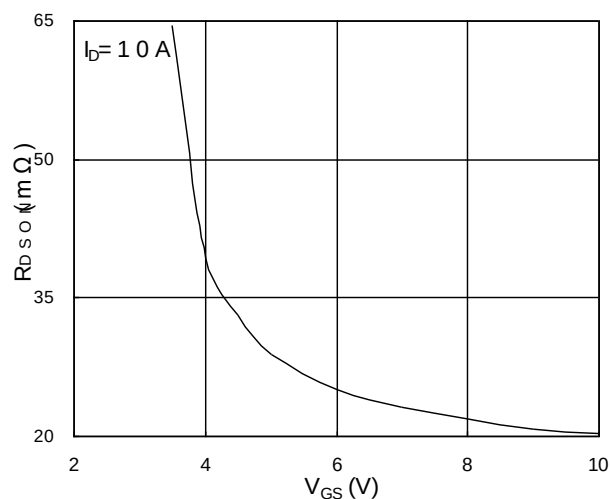


Fig.2 On-Resistance vs. Gate-Source

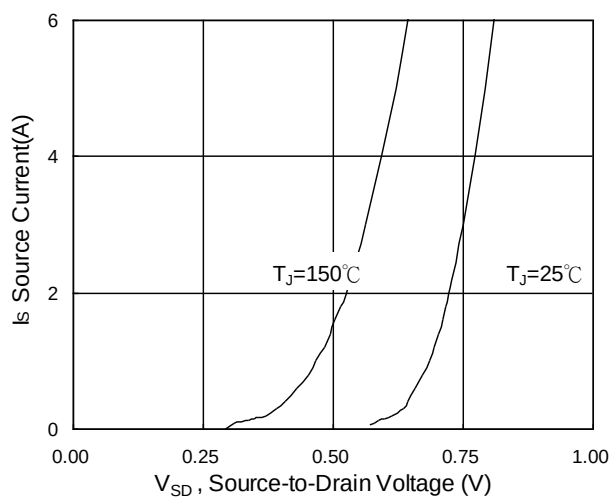


Fig.3 Forward Characteristics Of Reverse

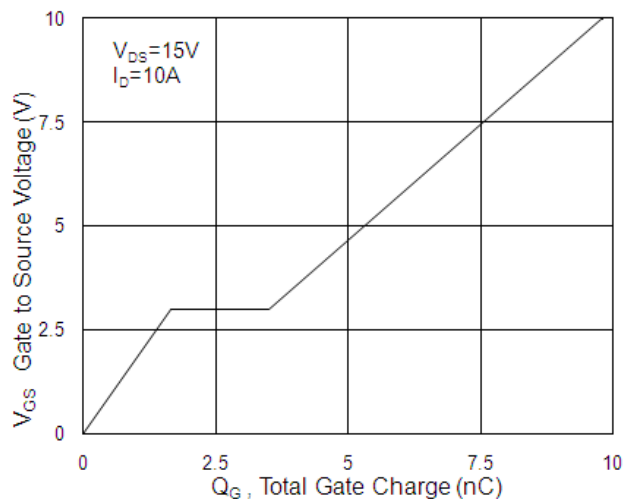


Fig.4 Gate-Charge Characteristics

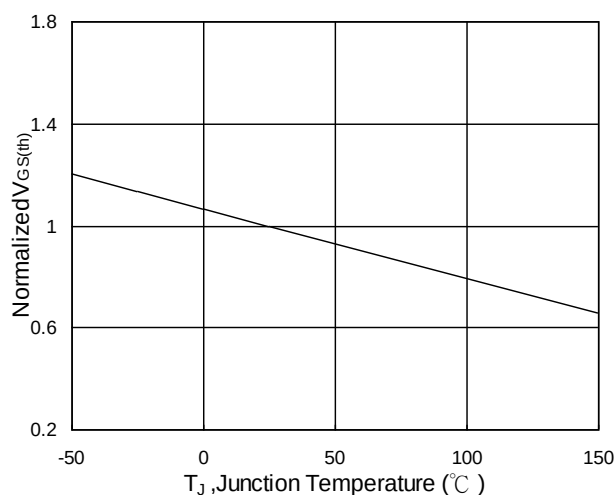


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

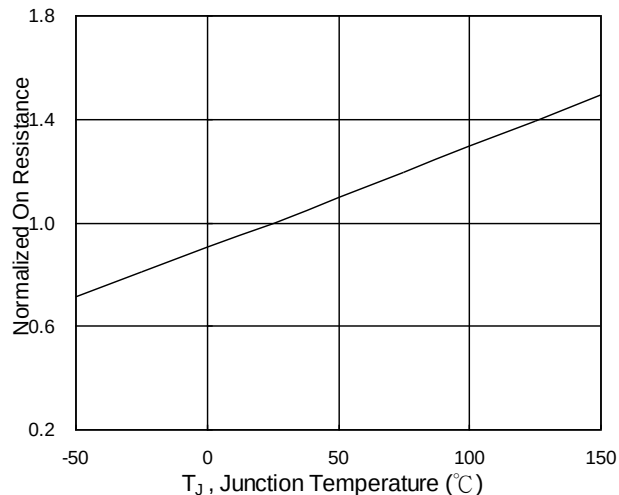


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

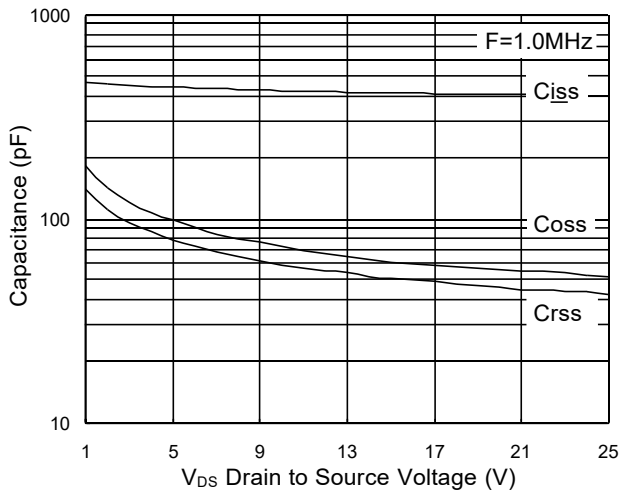


Fig.7 Capacitance

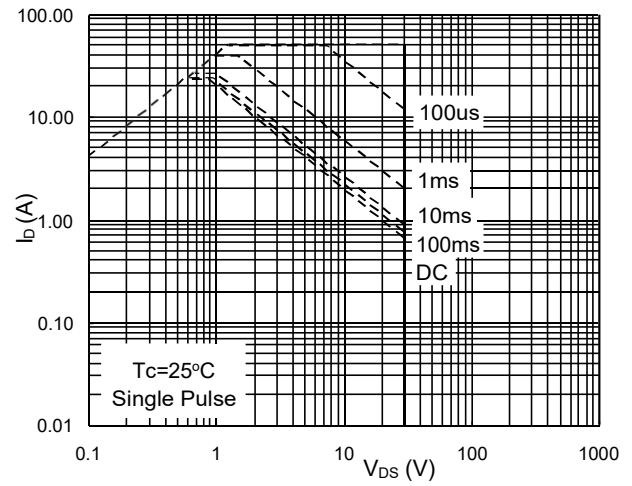


Fig.8 Safe Operating Area

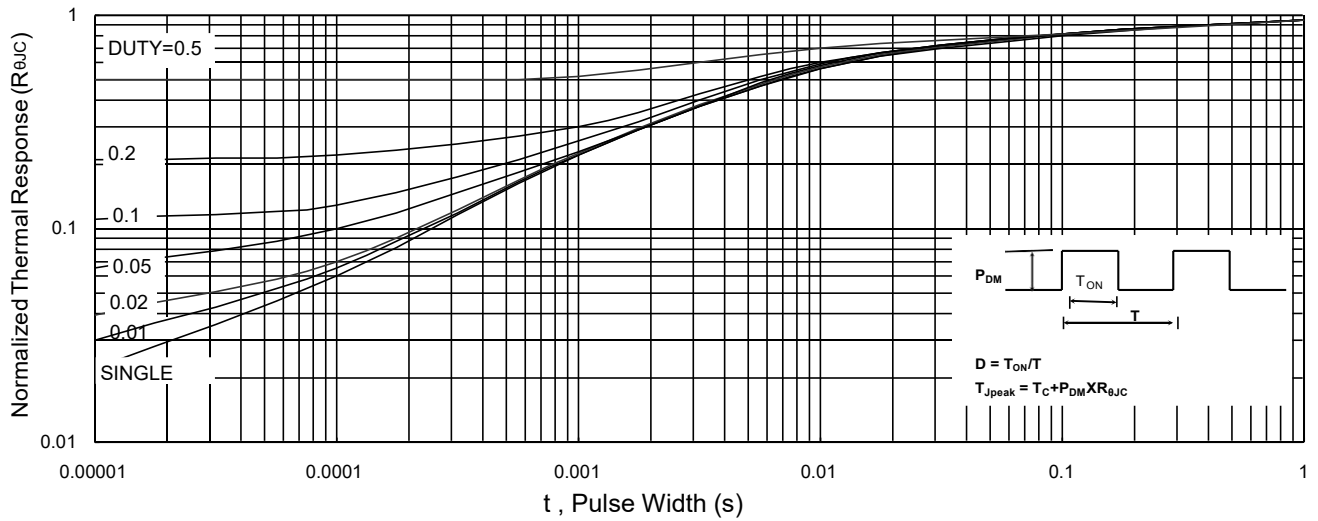


Fig.9 Normalized Maximum Transient Thermal Impedance

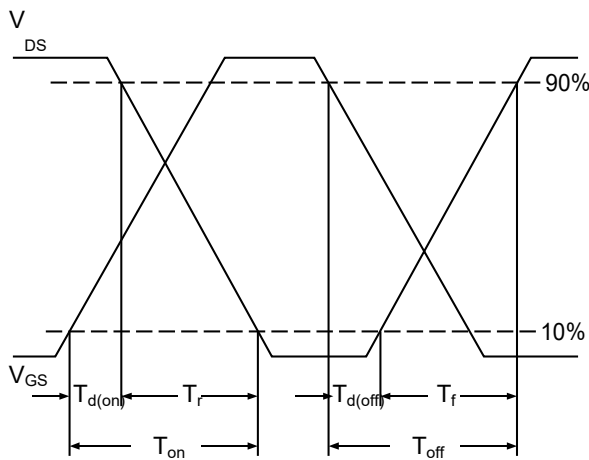


Fig.10 Switching Time Waveform

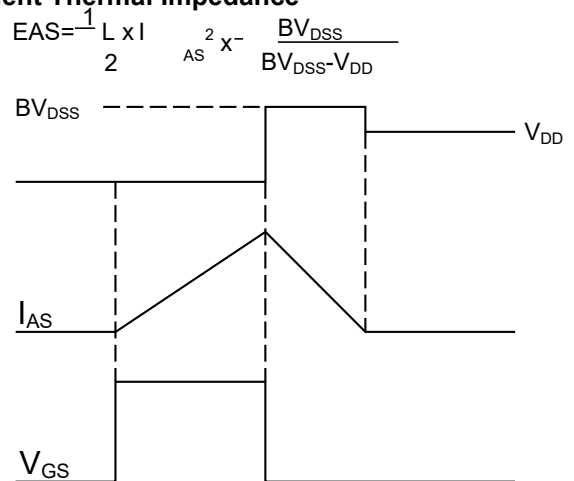
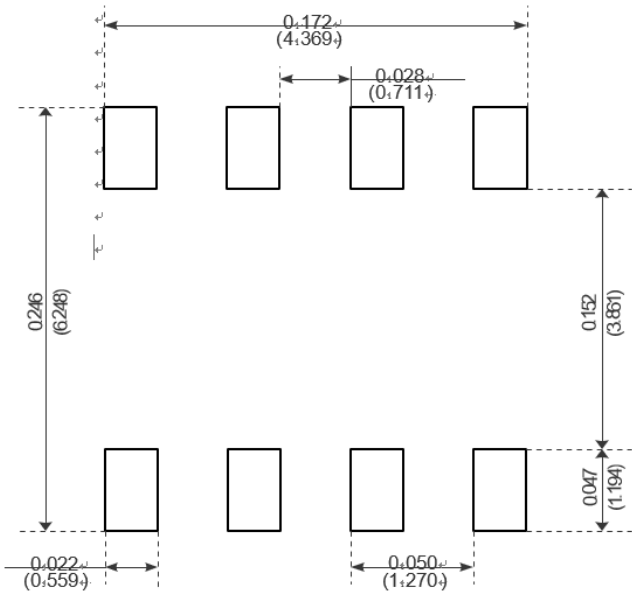
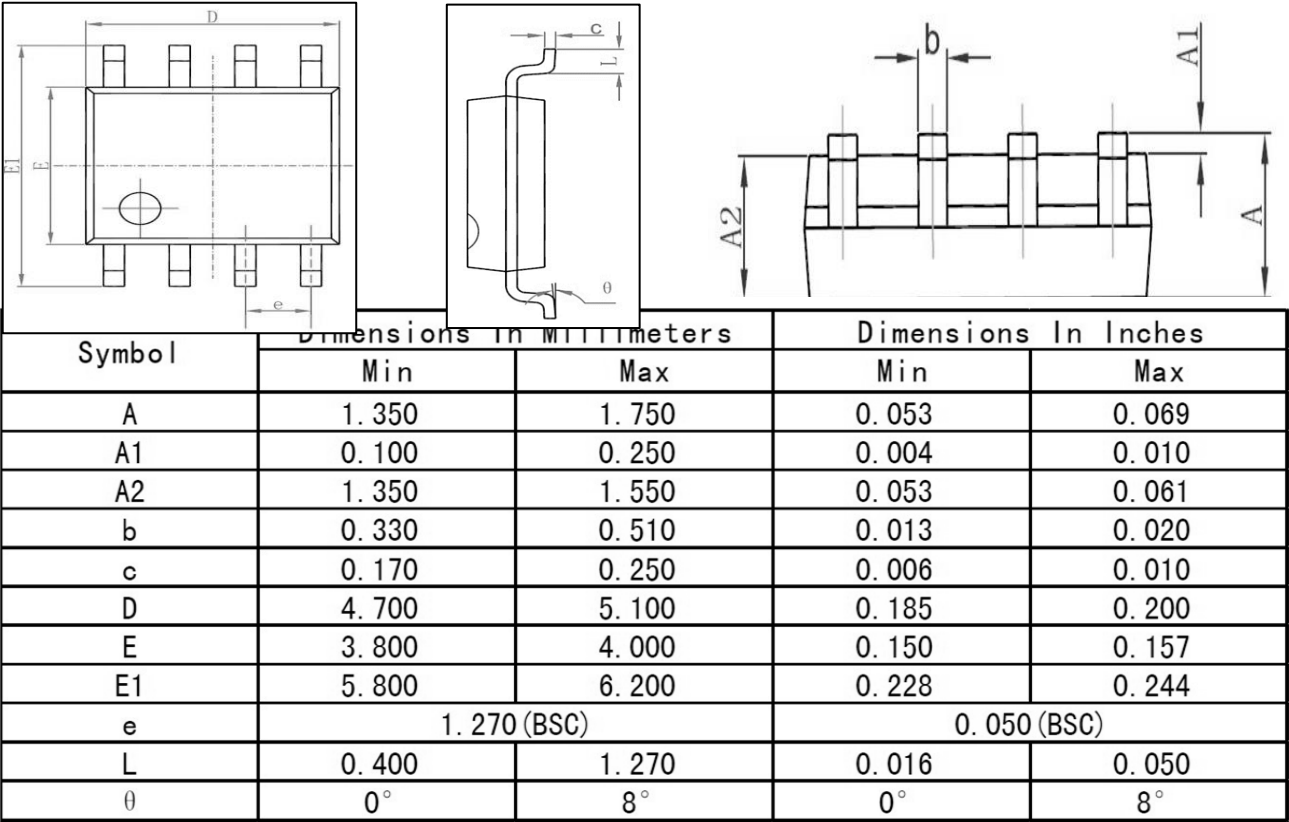


Fig.11 Unclamped Inductive Switching Waveform

Package Mechanical Data-SOP-8



Recommended Minimum Pads