



HY15N10

N-CHANNEL POWER MOSFET

15A, 100V N-CHANNEL POWER MOSFET

DESCRIPTION

The HY15N10A uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

FEATURES

- * Excellent package for good heat dissipation
- * Ultra low gate charge
- * Low reverse transfer capacitance
- * Fast switching capability
- * Avalanche energy specified

APPLICATION

- * Power switching application

MARKING

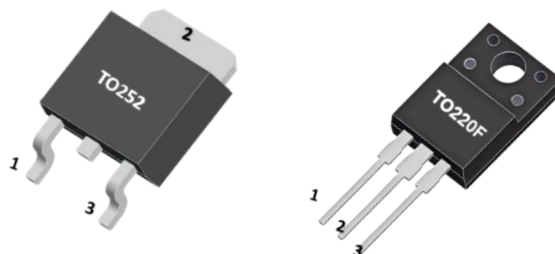


HY: HY LOGO

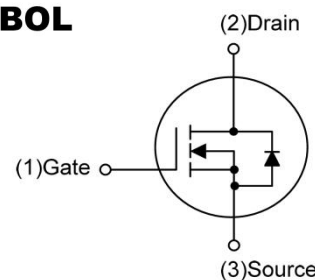
HY15N10A=Device Code

XXXX=Date Code

Solid Dot=Green molding compound



SYMBOL



ABSOLUTE MAXIMUM RATINGS($T_A=25^\circ\text{C}$, unless otherwise specified.)

SYMBOL	PARAMETER		VALUE	UNIT
V_{DS}	Drain-Source Voltage		100	V
V_{GS}	Gate Source Voltage		± 20	V
I_D	Continuous Drain Current		15	A
I_{DM}	Pulsed Drain Current (Note 2)		30	A
dv/dt	Peak Diode Recovery dv/dt (Note 3)		10	V/ns
P_D	Power Dissipation	TO-220F	30	W
		TO-252	42	W
T_J	Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature		-40 to 125	$^\circ\text{C}$

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. $I_{SD} \leq 15A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J = 25^\circ\text{C}$.



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■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F	θ_{JA}	62.5	°C/W
	TO-252		110	
Junction to Case	TO-220F	θ_{JC}	4.17	°C/W
	TO-252		2.98 (Note)	

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

■ ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	V(BR) DSS	VGS=0V, ID=250μA	100			V
Zero gate voltage drain current	IDSS	VDS=100V,VGS=0V			1	μA
Gate-Source Leakage Current	IGSS	VGS=±20V, VDS=0V			±100	nA
ON CHARACTERISTICS						
Static drain-source on-sate resistance	RDS(ON)	VGS=10V, ID=10A		87	100	mΩ
		VGS=4.5V, ID=10A	77	92	120	mΩ
Gate Threshold Voltage	VGS(TH)	VGS=VDS,ID=250μA	1.0		2.2	V
DYNAMIC PARAMETERS						
Input Capacitance	CISS	VGS=0V,VDS=25V,f=1MHz		780		pF
Output Capacitance	COSS			47		pF
Reverse Transfer Capacitance	CRSS			36		pF
SWITCHING PARAMETERS (Note 4,5)						
Total gate charge	Qg	VDS=80V,VGS=10V,ID=15A IG=1mA (Note 1, 2)		25.8		nC
Gate-source charge	Qgs			6.4		
Gate-drain charge	Qgd			5.6		
Turn-On Delay Time	td(on)	VDS=50V,ID=0.5A,VGS=10V RG=25Ω (Note 1, 2)		11.4		nS
Turn-On Rise time	tr			11		
Turn-Off Delay Time	td(off)			103		
Turn-Off Fall time	tf			29		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-source diode forward voltage (Note 1)	VSD	VGS =0V, IS=8A			1.4	V
Continuous drain-source diode forward current	IS				15	A
Pulsed drain-source diode forward current	ISM				30	A
Reverse Recovery Time (Note 1)	trr	IS=15A, VGS=0V		50		ns
Reverse Recovery Charge	Qrr	dIF/dt =100A/μs		84		nC

Notes:

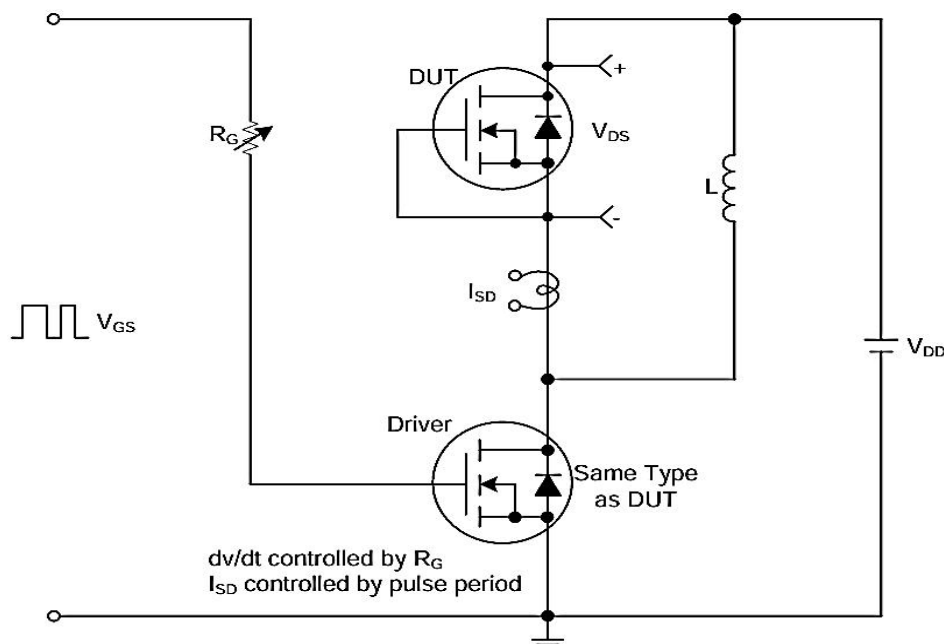
1. Pulse Test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating ambient temperature.



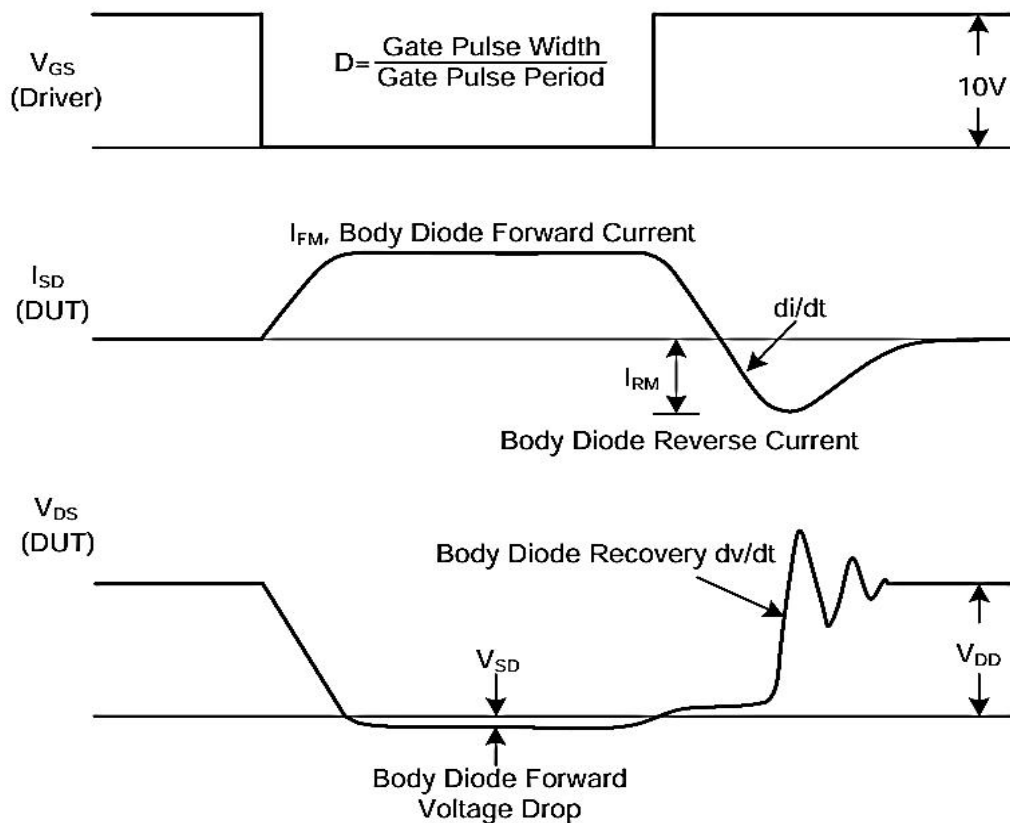
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■ TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit



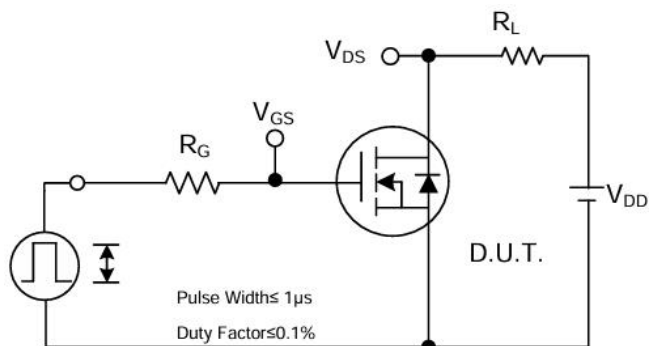
Peak Diode Recovery dv/dt Waveforms rms



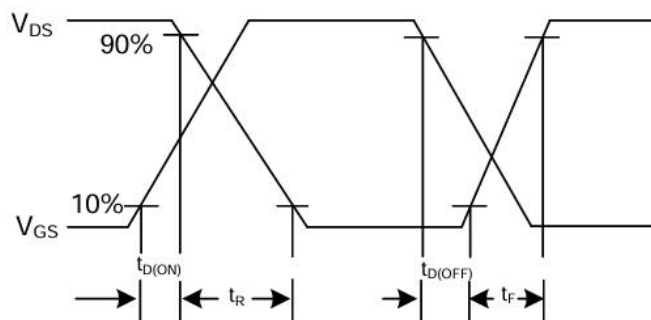
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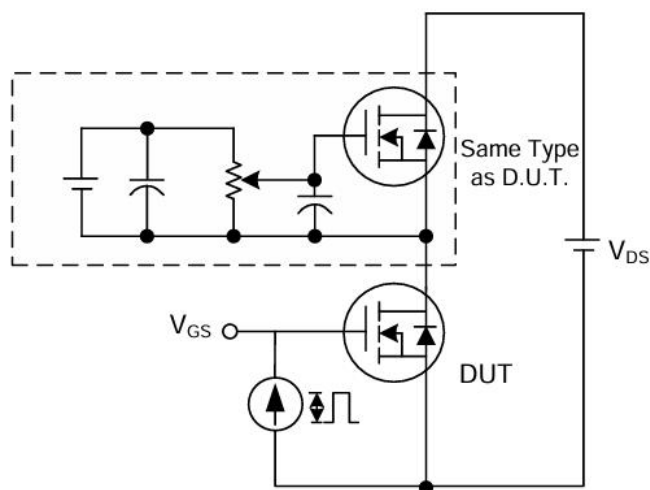
■ TEST CIRCUITS AND WAVEFORMS(Con.t)



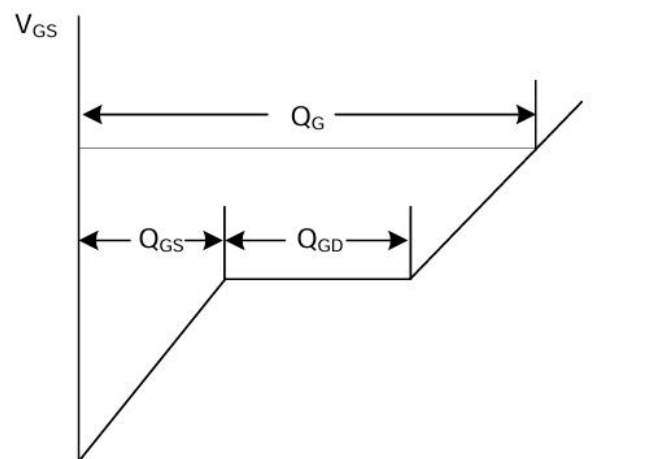
Switching Test Circuit



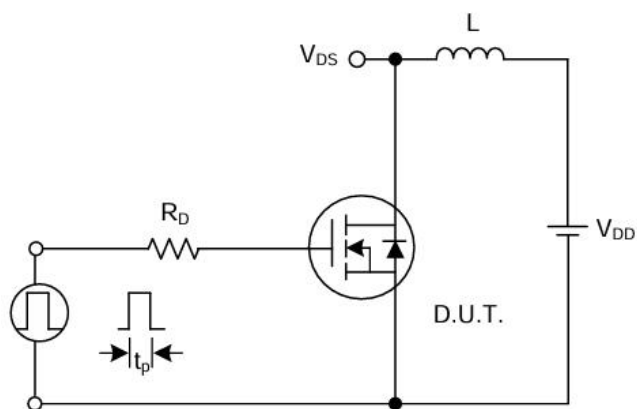
Switching Waveforms



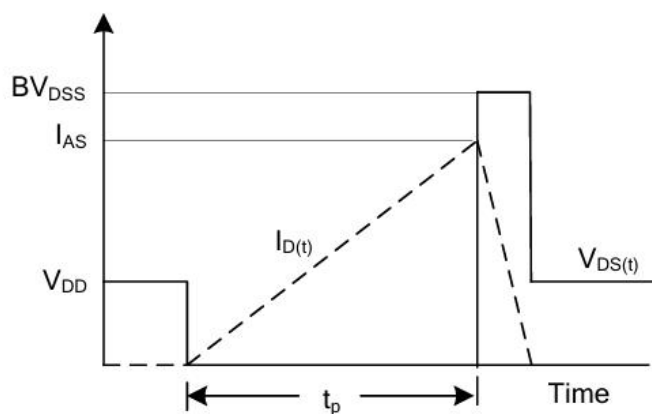
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



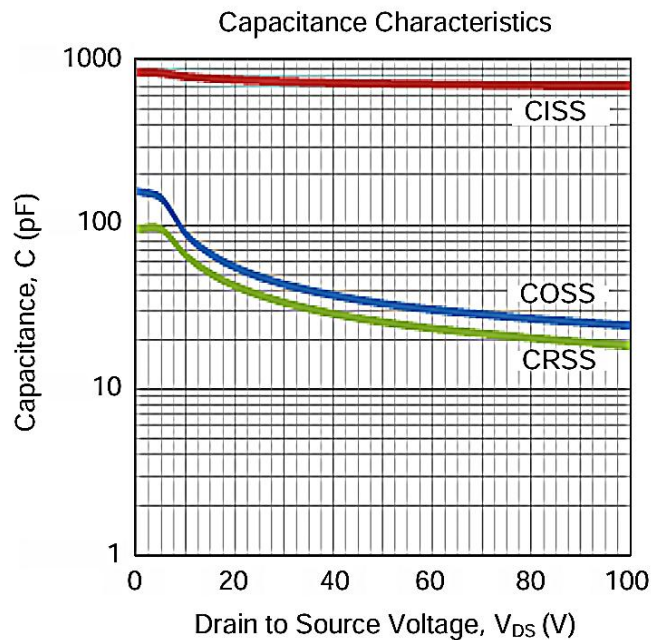
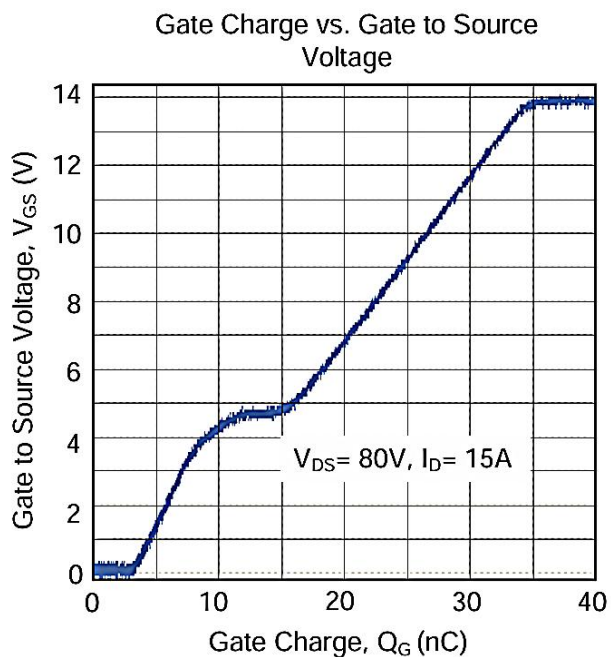
Unclamped Inductive Switching Waveforms



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■ TYPICAL CHARACTERISTICS

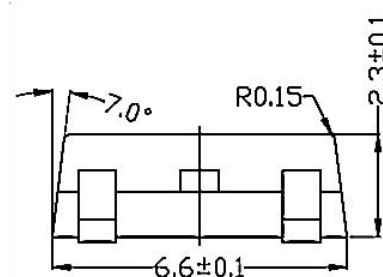
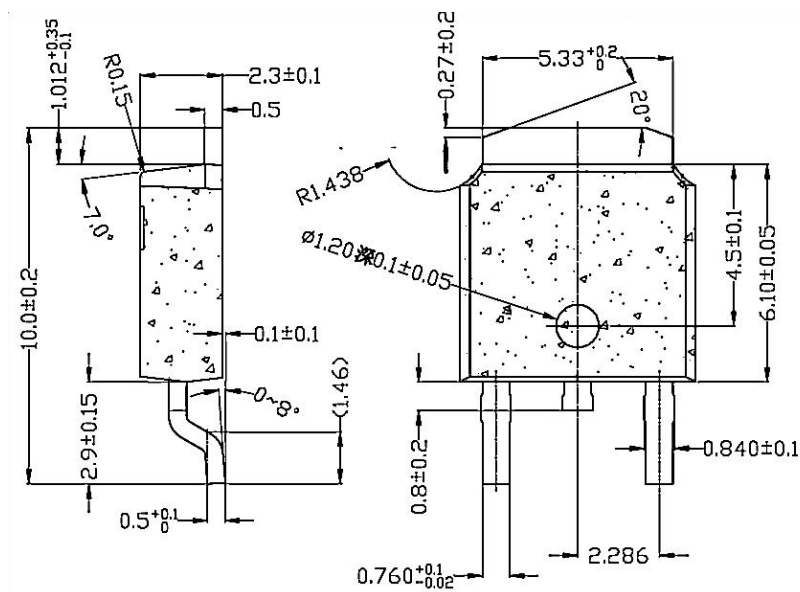




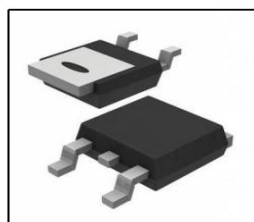
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TO - 252 PACKAGE OUTLINE DIMENSIONS



TO - 252 PACKING INFORMATION



2500PC
S/reel



2 Reel/BOX



Outer box

5 Inner
Box



Inner box

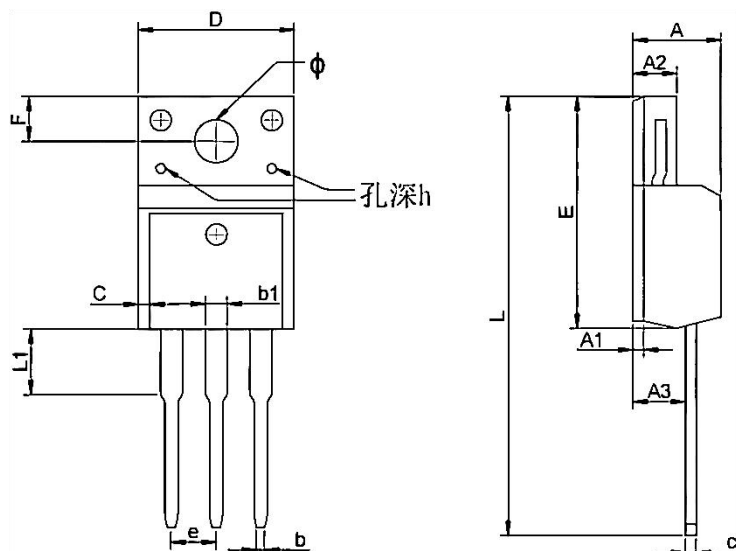
Package version	Reel dimensions $\Phi \times H$ (mm)	Per Reel (pcs)	Reels per box	Inner box dimensions $L \times W \times H$ (mm)	Outer box (pcs)	Outer box dimensions $L \times W \times H$ (mm)
TO-252	$\Phi 330 \times 20$	2500	2	360*340*50	25000	375*375*280



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TO-220F PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.300	4.750	0.169	0.185
A1	1.830 REF		0.072 REF	
A2	2.300	2.850	0.090	0.112
A3	2.500	2.900	0.098	0.114
b	0.400	0.420	0.016	0.016
b1	1.220	1.280	0.048	0.050
C	0.690	0.720	0.027	0.028
c	0.490	0.510	0.019	0.020
D	9.960	10.200	0.392	0.400
E	15.000	15.950	0.588	0.625
e	2.574 TYP		0.101TYP	
F	3.470 REF		0.136 REF	
y	3.200 REF		0.125 REF	
h	0.000	0.300	0.000	0.012
L	28.780	28.900	1.128	1.133
L1	2.990	3.100	0.117	0.122

TO - 220F PACKING INFORMATION



50PCS

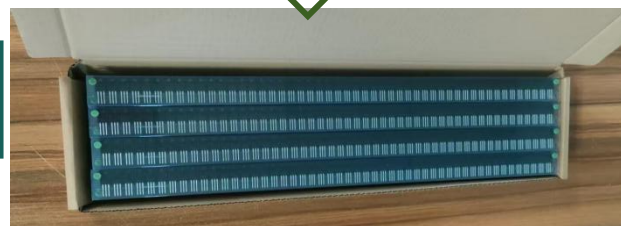


20 Tube



Outer Box

5 Inner
Box



Inner Box

Package version	Tube dimensions LxWxH (mm)	Per Tube (pcs)	Tube per box	Inner box dimensions LxWxH (mm)	PCS/ Inner box	Outer box dimensions LxWxH(mm)	PCS/ Outer box
TO-220F	530*32*7	50	20	580*155*50	1000	602*277*188	5000