



HY40N10

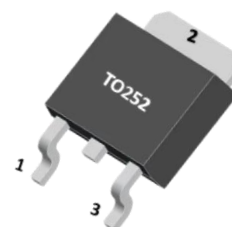
N-CHANNEL POWER MOSFET

40A, 100V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

DESCRIPTION

The HY40N10A is a N-channel Power MOSFET, it uses our advanced technology to provide the customers with low $R_{DS(ON)}$ characteristic by high cell density trench technology. The HY40N10A is suitable for high efficiency synchronous rectification in SMPS, UPS, hard switched and high frequency circuits.

The HY40N10A meet the ROHS and Green Product requirement with full function reliability approved.



FEATURE

- * High density cell design for ultra low $R_{DS(on)}$
- * Fully characterized avalanche voltage and current
- * Good stability and uniformity with high EAS
- * Special process technology for high ESD capability
- * Excellent package for good heat dissipation

MARKING



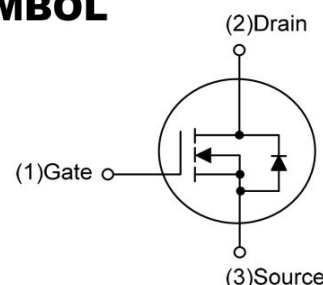
 : HY LOGO

HY40N10A=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 (Note 1)	40	A
I_{DM}	Pulsed Drain Current (Note 2)	160	A
EAS	Single Pulsed Avalanche Energy (Note 3)	320	mJ
PD	Power Dissipation (Note 1)	140	W
T_J	Storage Temperature	150	$^{\circ}\text{C}$
T_{STG}	Thermal Resistance Fr .00m Junction To Ambient	-55~150	$^{\circ}\text{C}$
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	100	$^{\circ}\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance From Junction To Case	0.89	$^{\circ}\text{C}/\text{W}$
TL	Lead Temperature for Soldering Purposes(1/8" from case for 10s)	260	$^{\circ}\text{C}$

Notes: EAS condition: $V_{DD}=50\text{V}$, $L=0.5\text{mH}$, $R_G=25\Omega$, Starting $T_J = 25^{\circ}\text{C}$



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■ ELECTRICAL CHARACTERISTICS (T_A=25°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			10	μA
Gate-Source Leakage Current	IGSS	VGS=±20V, VDS=0V			±100	nA
ON CHARACTERISTICS (Note 4)						
Drain-source on-state resistance	RDS(ON)	VGS=10V, ID=2.0A		14	16	mΩ
		VGS=4.5V, ID=10A		22	18	mΩ
Gate Threshold Voltage	VGS(TH)	VGS=VDS,ID=250μA	1.0	1.8	2.5	V
Forward tranconductance	gfs	VDS=25V,ID=28A	32			S
DYNAMIC PARAMETERS (Note 4,5)						
Input Capacitance	CISS	VGS=0V,VDS=30V f=1.0MHz		3400	6800	pF
Output Capacitance	COSS			290	580	
Reverse Transfer Capacitance	CRSS			221	390	
SWITCHING PARAMETERS (Note 4,5)						
Total gate charge	Qg	VDS=30V,VGS=10V ID=30A		94	180	nC
Gate-source charge	Qgs			16	34	
Gate-drain charge	Qgd			24	45	
Turn-On Delay Time	td(on)	VDD=30V,ID=2A VGS=10V, RG=2.5Ω RL=15Ω		15		nS
Turn-On Rise time	tr			11		
Turn-Off Delay Time	td(off)			52		
Turn-Off Fall time	tf			13		
Drain-Source Diode Characteristics						
Continuous drain-source diode forward current	IS	(note1)			40	A
Pulsed drain-source diode forward current	ISM	(note2)			160	A
Drain-Source Diode Forward Voltage (note4)	VSD	IS=28A,VGS=0V			1.2	V

Notes:

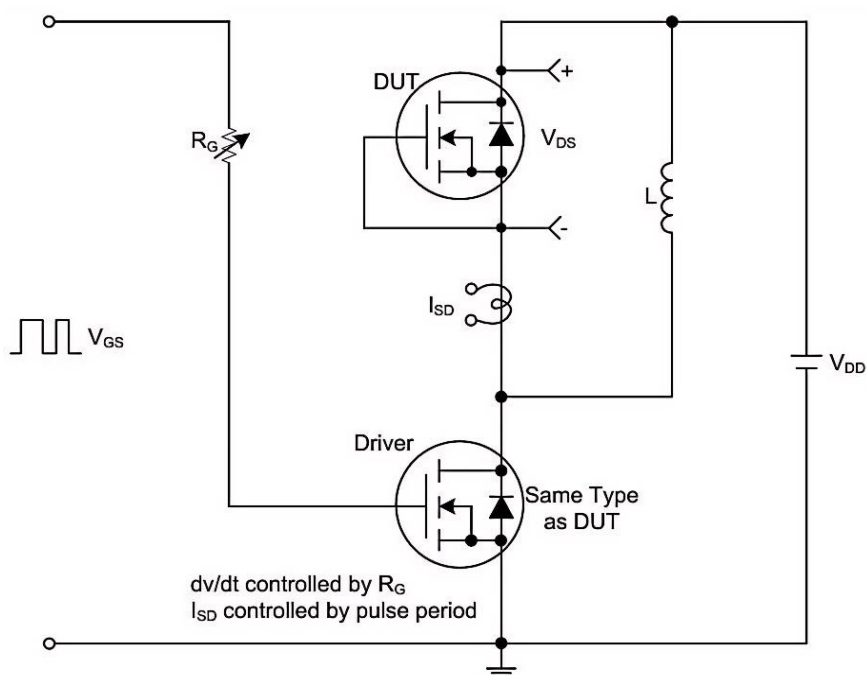
1. T_C=25°C Limited only by maximum temperature allowed.
2. PW≤10μs, Duty cycle≤1%.
3. EAS condition: V_{DD}=50V, V_{GS}=10V, L=0.5mH, R_G=25Ω Starting T_J = 25°C.
4. Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.
5. Guaranteed by design, not subject to production.
6. The value of R_{θJA} is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with T_a=25°C.



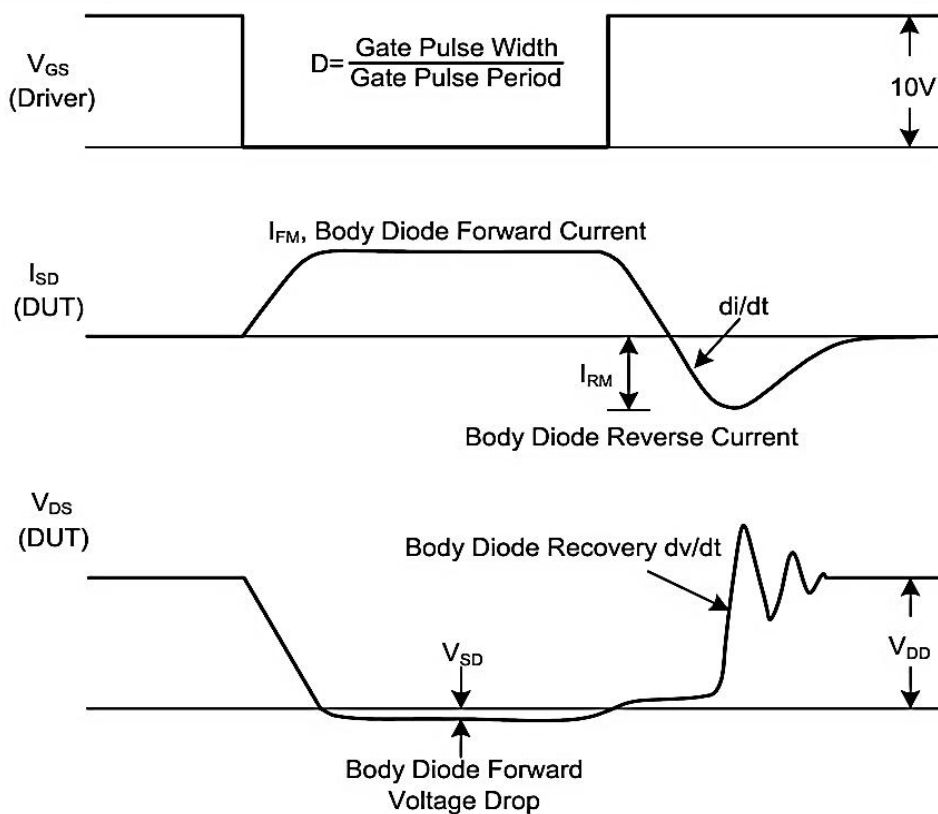
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■ TEST CIRCUITS AND WAVEFORMS(1)



Peak Diode Recovery dv/dt Test Circuit



Peak Diode Recovery dv/dt Test Circuit and Waveforms

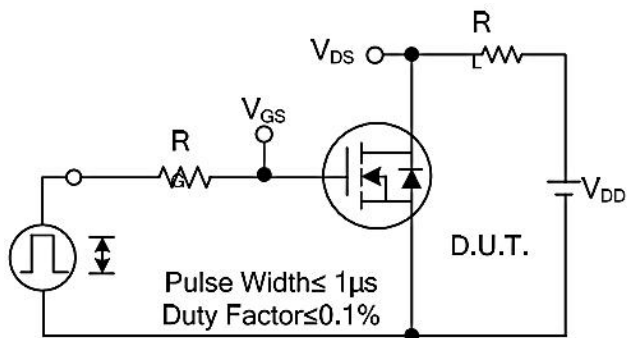
Peak Diode Recovery dv/dt Waveforms



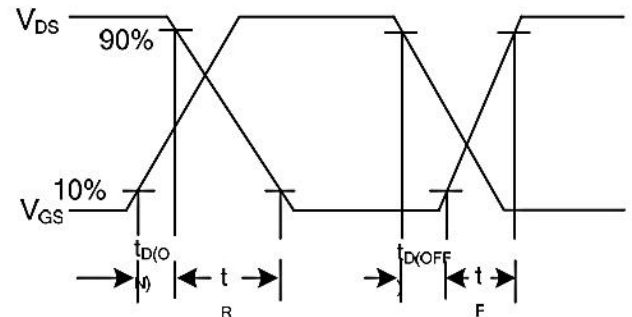
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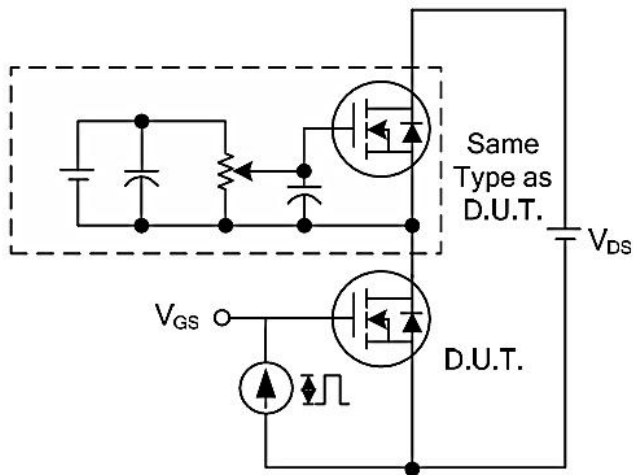
■ TEST CIRCUITS AND WAVEFORMS(2)



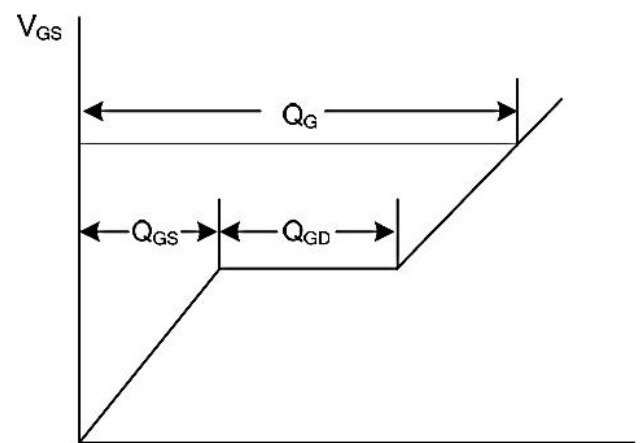
Switching Test Circuit



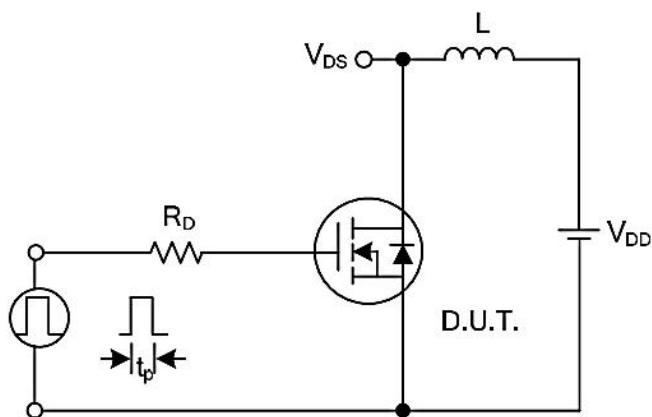
Switching Waveforms



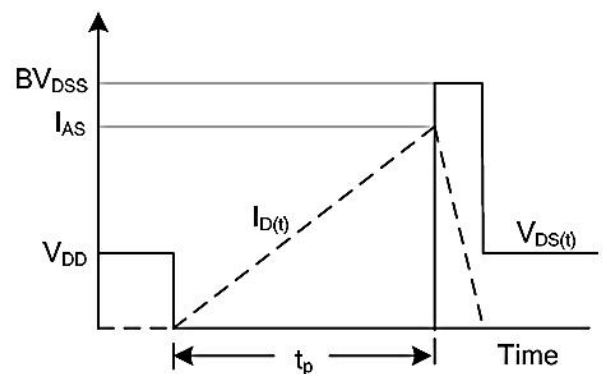
Gate Charge Test Circuit



Charge Gate Charge Waveform



Unclamped Inductive Switching Test Circuit



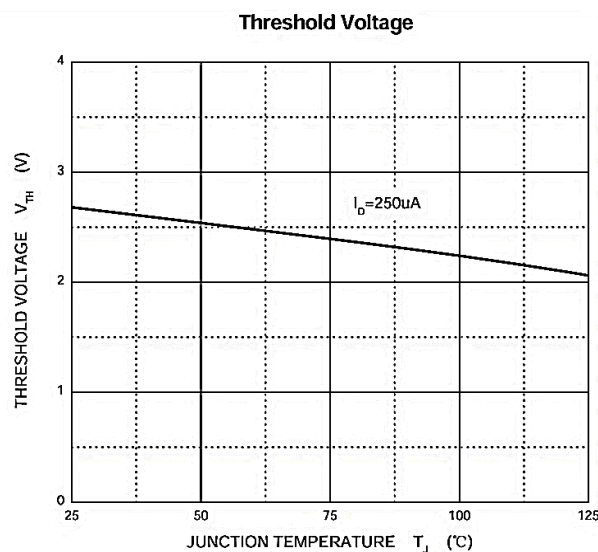
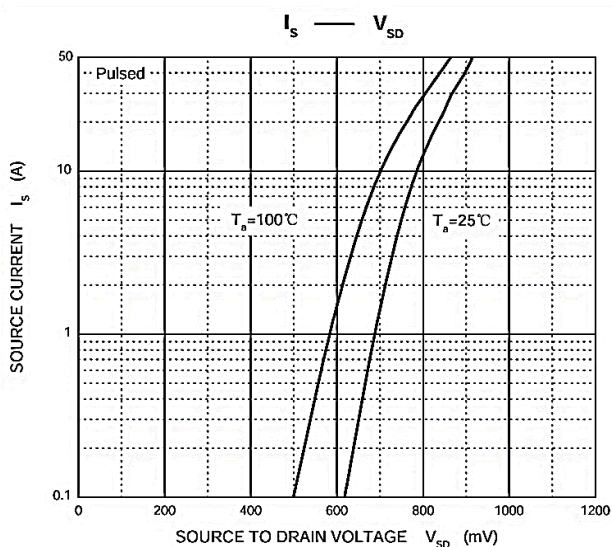
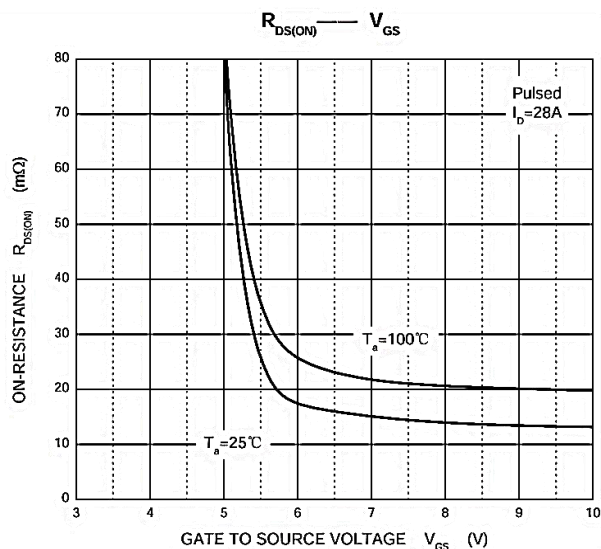
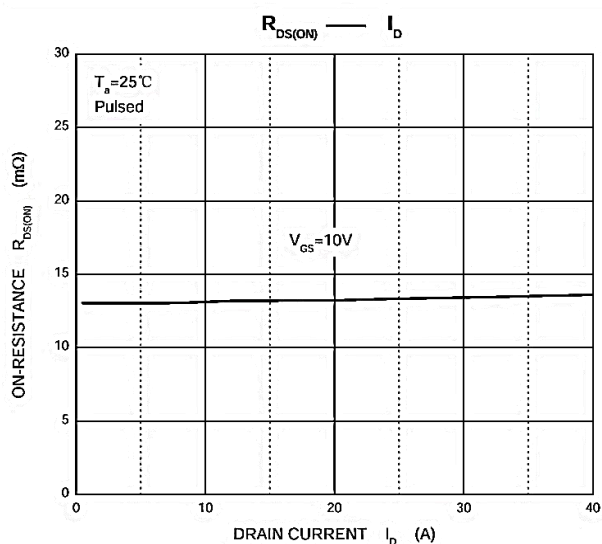
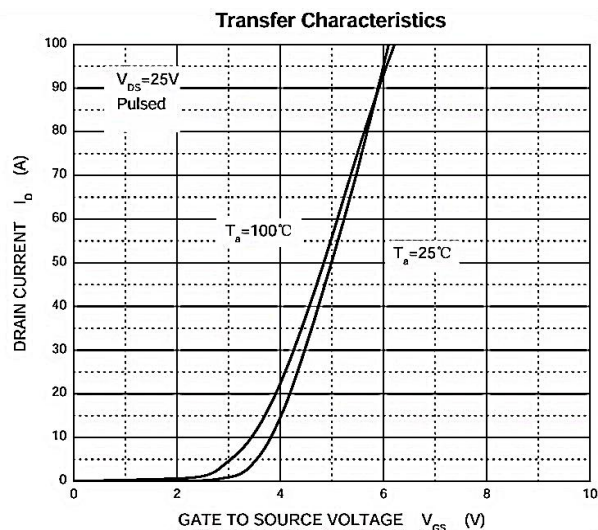
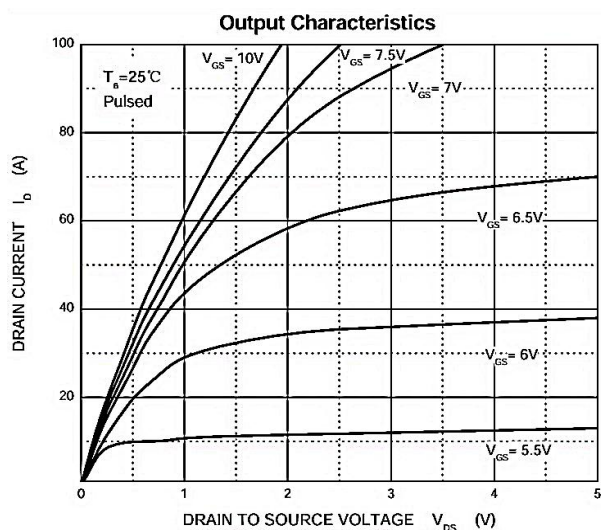
Unclamped Inductive Switching Waveforms



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■ TYPICAL CHARACTERISTICS

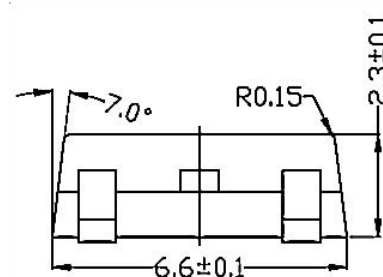
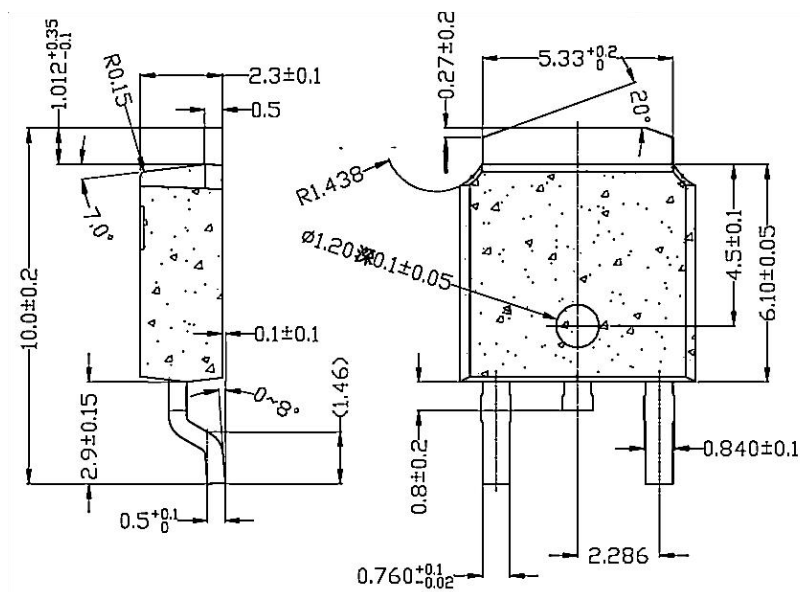




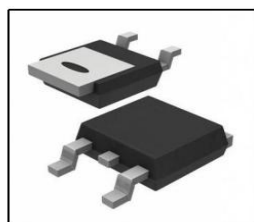
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TO - 252 PACKAGE OUTLINE DIMENSIONS



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