

40N10

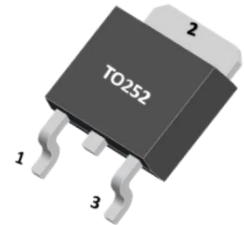
N-CHANNEL POWER MOSFET

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

DESCRIPTION

The 40N10 is the highest performance N-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications.

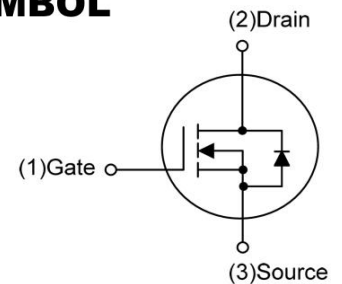
The HY40N10 meet the ROHS and Green Product requirement with full function reliability approved.



FEATURE

- * Super Low Gate Charge
- * Green Device Available
- * Excellent $C_{dv/dt}$ effect decline

SYMBOL



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

Symbol	Parameter		Max.	Units
VDSS	Drain-Source Voltage		100	V
VGSS	Gate-Source Voltage		± 20	V
ID	Continuous Drain Current	TC = 25°C	40	A
		TC = 100°C	21	A
IDM	Pulsed Drain Current note1		120	A
EAS	Single Pulsed Avalanche Energy note2		25	mJ
PD	Power Dissipation	TC = 25°C	35	W
RθJC	Thermal Resistance, Junction to Case		3.6	°C/W
TJ, TSTG	Operating and Storage Temperature Range		-55 to +175	°C

40N10

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■ ELECTRICAL CHARACTERISTICS (TA=25°C, unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V(BR)DSS	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	100	-	-	V
IDSS	Zero Gate Voltage Drain Current	VDS=100V, VGS=0V,	-	-	1.0	μA
IGSS	Gate to Body Leakage Current	VDS=0V, VGS=±20V	-	-	±100	nA
On Characteristics						
VGS(th)	Gate Threshold Voltage	VDS=VGS, ID=250μA	1.2	1.7	2.5	V
RDS(on)	Static Drain-Source on-Resistance note3	VGS=10V, ID=20A	-	16	19	mΩ
		VGS=4.5V, ID=10A	-	20	25	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=25V, VGS=0V f=1.0MHz	-	1100	-	pF
Coss	Output Capacitance		-	320	-	pF
Crss	Reverse Transfer Capacitance		-	35	-	pF
Qg	Total Gate Charge	VDS=80V, ID=20A VGS=4.5V	-	20	-	nC
Qgs	Gate-Source Charge		-	3.1	-	nC
Qgd	Gate-Drain(“Miller”) Charge		-	14	-	nC
Switching Characteristics						
td(on)	Turn-on Delay Time	VDS=80V, ID=20A, RG=3.1Ω, VGS=4.5V	-	11	-	ns
tr	Turn-on Rise Time		-	91	-	ns
td(off)	Turn-off Delay Time		-	40	-	ns
tf	Turn-off Fall Time		-	71	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
IS	Maximum Continuous Drain to Source Diode Forward Current		-	-	40	A
ISM	Maximum Pulsed Drain to Source Diode Forward Current		-	-	120	A
VSD	Drain to Source Diode Forward Voltage	VGS=0V, IS=20A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	IF=20A,	-	64	-	ns
Qrr	Body Diode Reverse Recovery Charge	dI/dt=100A/μs	-	152	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. EAS condition : TJ=25°C, VDD=50V, VG=10V, L=0.5mH, RG=25Ω, IAS=11A.

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%.

40N10

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TYPICAL CHARACTERISTICS

Figure 1: Output Characteristics

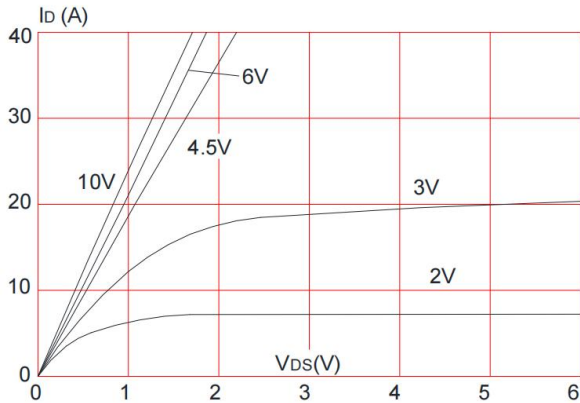


Figure 2: Typical Transfer Characteristics

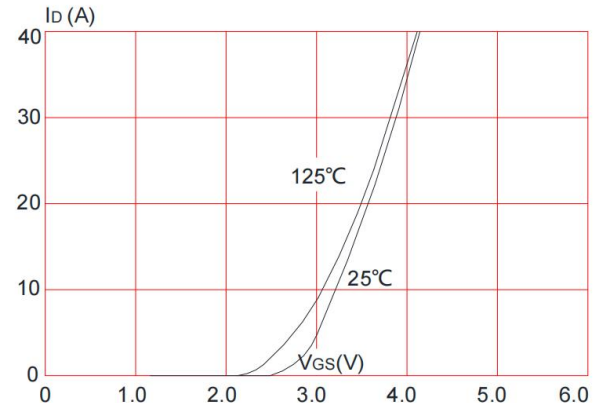


Figure 3: On-resistance vs. Drain Current

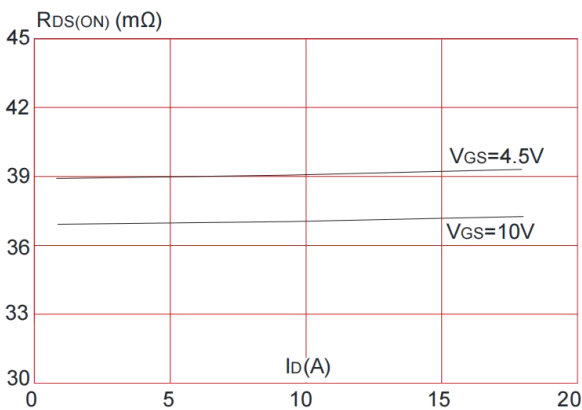


Figure 4: Body Diode Characteristics

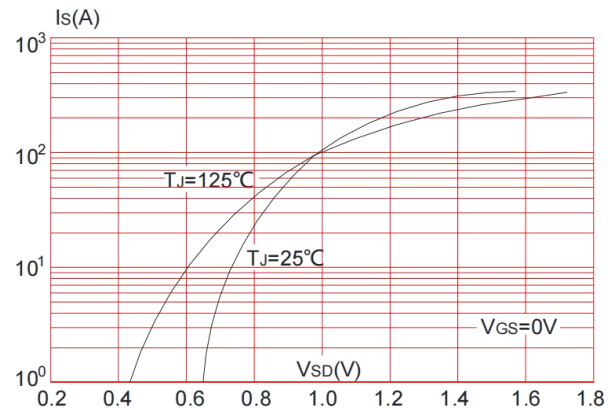


Figure 5: Gate Charge Characteristics

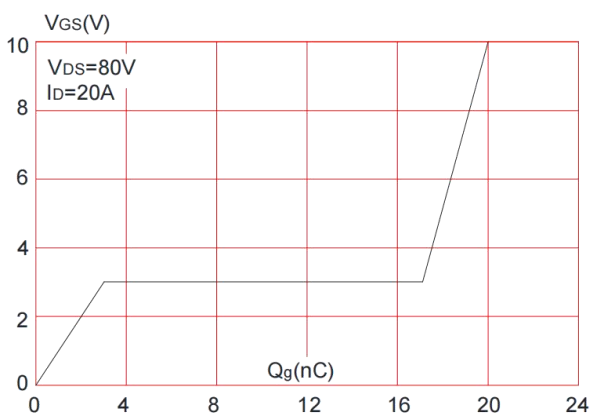
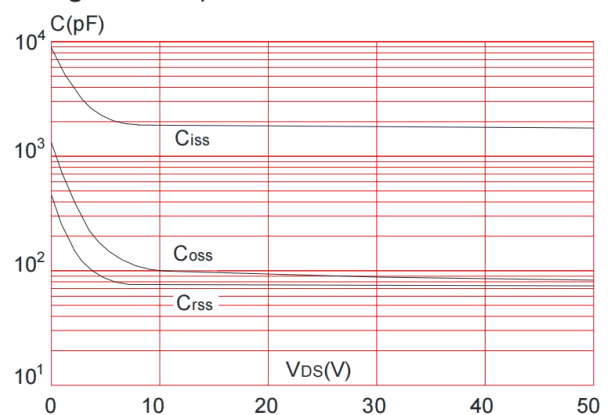


Figure 6: Capacitance Characteristics



40N10

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TYPICAL CHARACTERISTICS

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

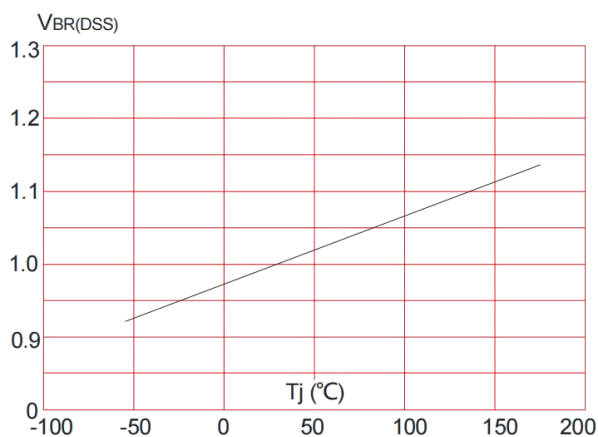


Figure 8: Normalized on Resistance vs. Junction Temperature

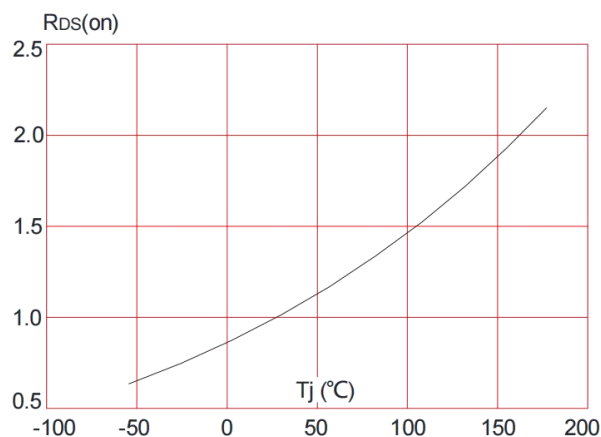


Figure 9: Maximum Safe Operating Area

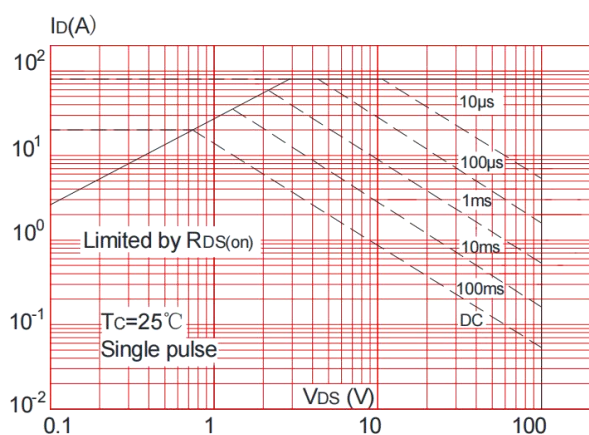


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

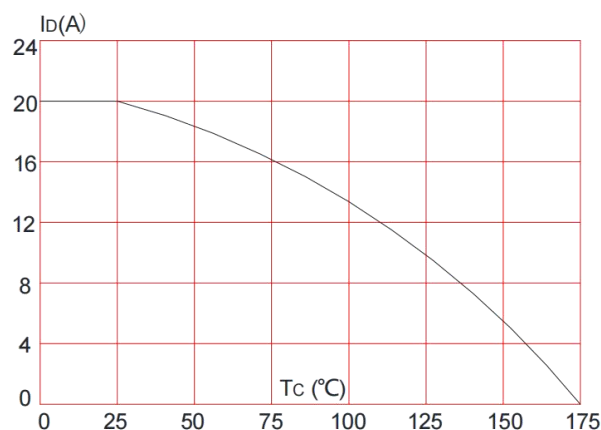
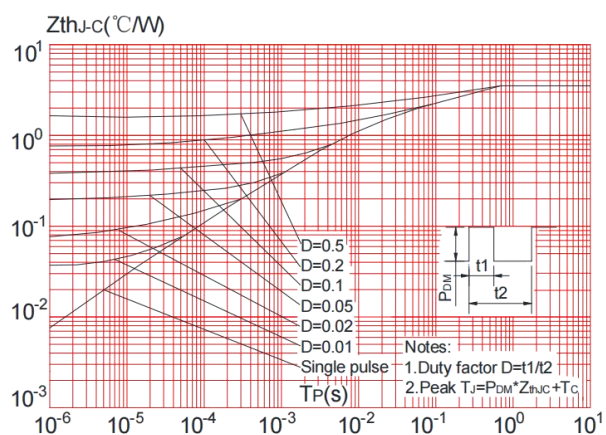
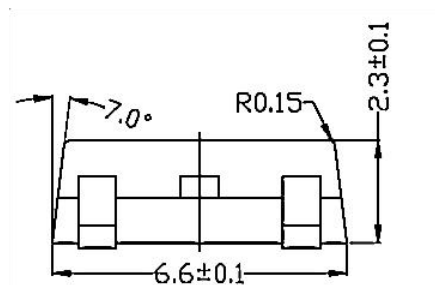


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case





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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)
T0-252	$\Phi 330 \times 20$	2500	2	360*340*50	25000	375*375*280