

20N06

N-CHANNEL POWER MOSFET

20A, 60V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

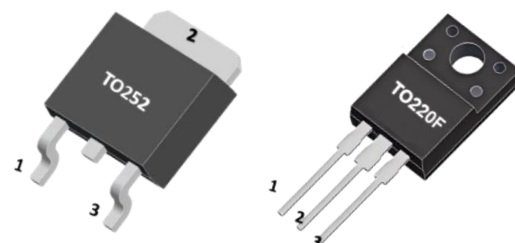
DESCRIPTION

The 20N06 is an N-channel enhancement mode power MOSFET using our advanced technology to provide customers with a minimum on-state resistance and superior switching performance. It also can withstand high energy pulse in the avalanche and commutation mode. The HY20N06 is universally applied in low voltage, such as automotive, high efficiency switching for DC/DC converters and DC motor control.

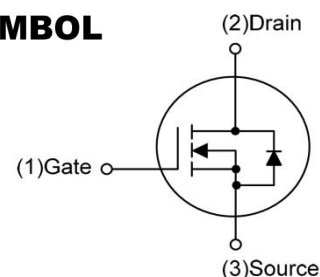
The 20N06 meet the ROHS and Green Product requirement with full function reliability approved.

FEATURE

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



SYMBOL



ABSOLUTE MAXIMUM RATINGS(TA=25°C, unless otherwise specified.)

SYMBOL	PARAMETER		VALUE	UNIT
VDSS	Drain-Source Voltage		60	V
VGSS	Gate Source Voltage		±20	V
ID	Continuous Drain Current (Note 1)		20	A
IDM	Pulsed Drain Current (Note 2)		80	A
EAS	Single Pulsed Avalanche Energy (Note 3)		49	mJ
PD	Maximum Power Dissipation (Note 1)	TO-220F	30	W
		TO-252	40	
TJ	Storage Temperature		150	°C
TSTG	Thermal Resistance From Junction To Ambient		-55~150	°C
RθJA	Thermal Resistance from Junction to Ambient (Note 6)	TO-220F	62.5	°C/W
		TO-252	100	
RθJC	Thermal Resistance From Junction To Case (Note 1)	TO-220F	5	°C/W
		TO-252	3.12	

Notes: 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.

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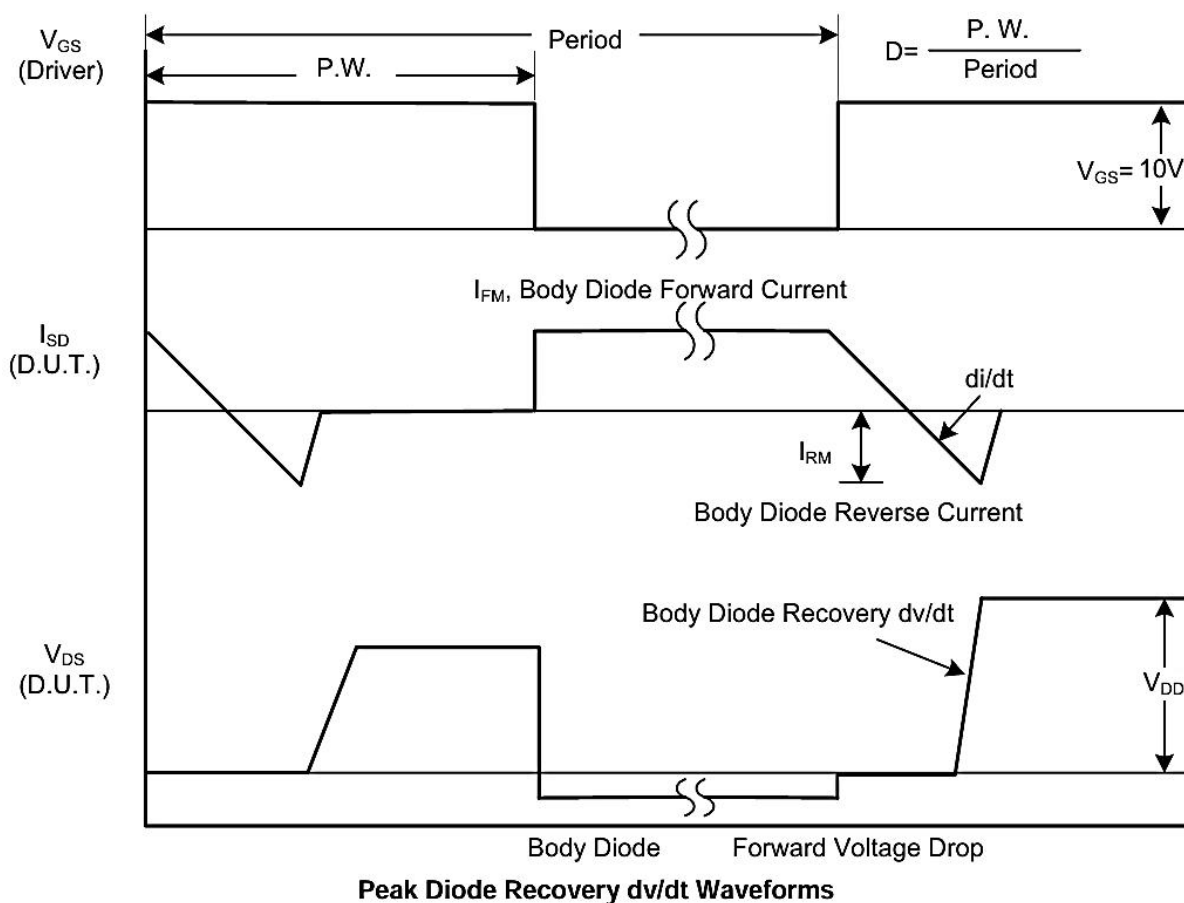
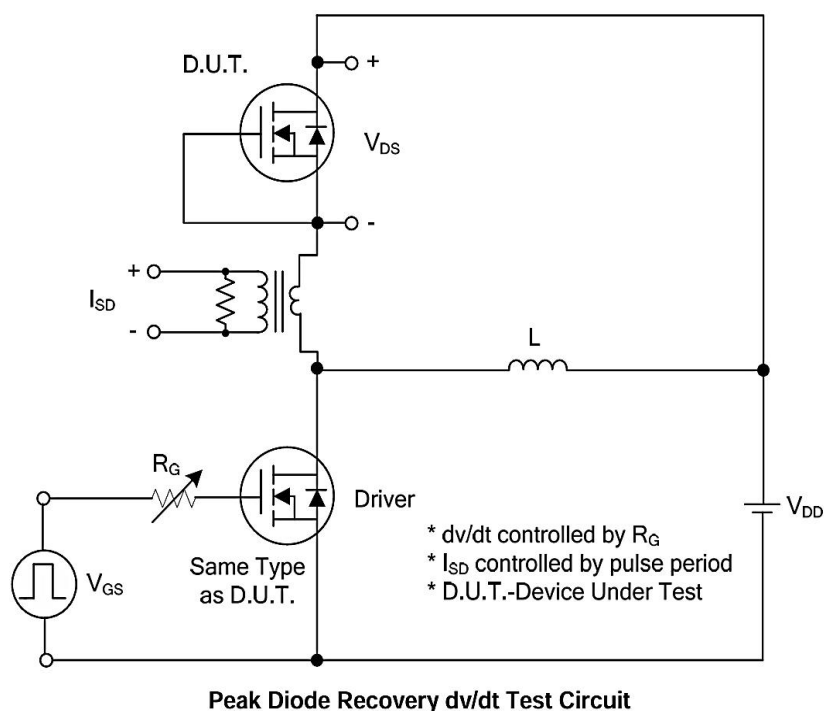
■ ELECTRICAL CHARACTERISTICS (TA=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =60V,V _{GS} =0V			1	μA
		V _{DS} =48V,V _{GS} =0V,T _J =125°C			10	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS (Note 4)						
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10A		26	35	mΩ
		V _{GS} =4.5V, I _D =10A		35	50	
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} ,I _D =250μA	1.0	1.7	2.5	V
DYNAMIC PARAMETERS (Note 4,5)						
Input Capacitance	C _{ISS}	V _{GS} =0V,V _{DS} =25V f=1.0MHz		850	1700	pF
Output Capacitance	C _{OSS}			60	120	
Reverse Transfer Capacitance	C _{RSS}			55	110	
Gate resistance	R _g	f =1MHz		2.0		Ω
SWITCHING PARAMETERS(Note 4,5)						
Total gate charge	Q _g	V _{DS} =30V,V _{GS} =10V I _D =10A		18	36	nC
Gate-source charge	Q _{gs}			2.0	4	
Gate-drain charge	Q _{gd}			4.4	8.8	
Turn-On Delay Time	td(on)	V _{DS} =30V,R _L =2.5Ω V _{GS} =10V, R _G =3Ω		4.2		nS
Turn-On Rise time	tr			3.4		
Turn-Off Delay Time	td(off)			16		
Turn-Off Fall time	tr			2		
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Continuous drain-source diode forward current(Note1)	I _S				20	A
Pulsed drain-source diode forward current(Note 2)	I _{SM}				80	A
Drain-source diode forward voltage(Note 4)	V _{SD}	I _S =10A,V _{GS} =0V			1.2	V

Notes:

1. $T_C=25^\circ C$ Limited only by maximum temperature allowed.
2. $P_W \leq 10\mu s$, Duty cycle $\leq 1\%$.
3. EAS condition: $V_{DD}=30V, V_{GS}=10V, L=0.5mH, R_g=25\Omega$ Starting $T_J = 25^\circ C$.
4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
5. Guaranteed by design, not subject to production.
6. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25^\circ C$.

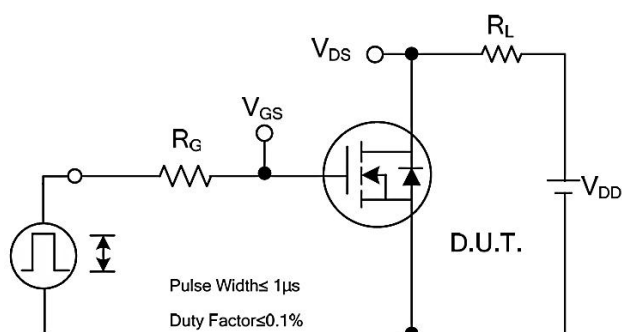
■ TEST CIRCUITS AND WAVEFORMS(1)



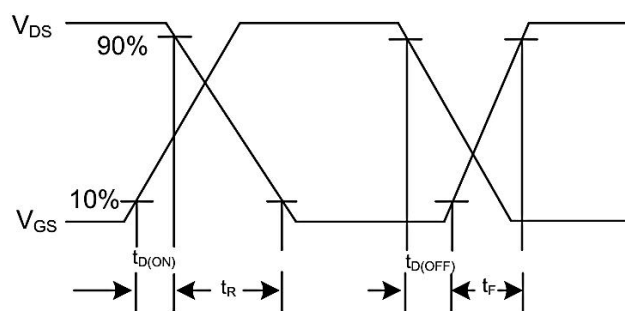
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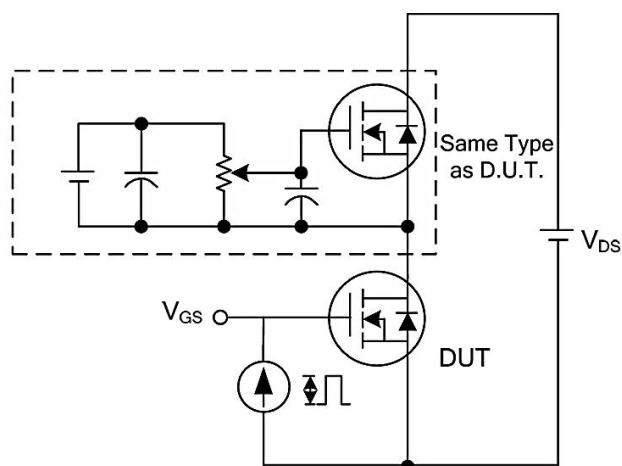
■ TEST CIRCUITS AND WAVEFORMS(2)



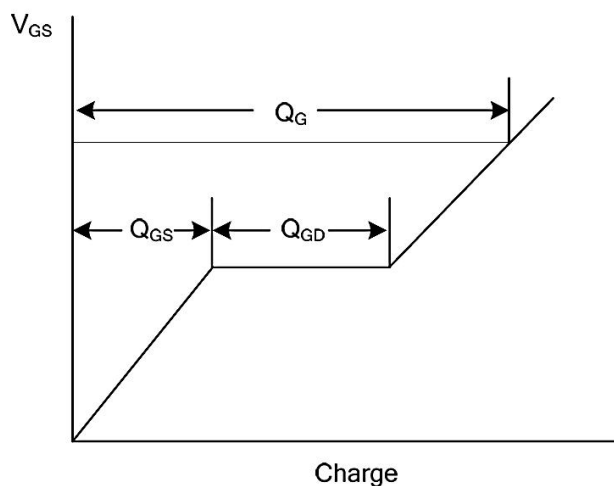
Switching Test Circuit



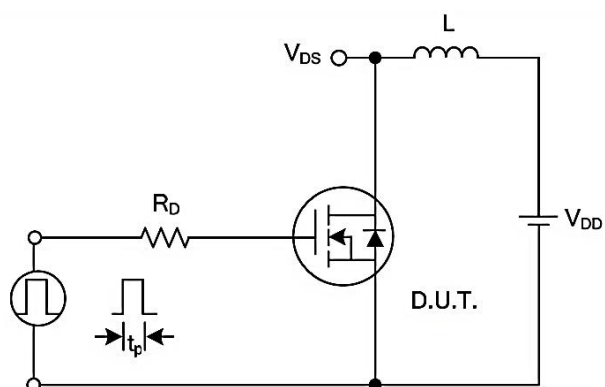
Switching Waveforms



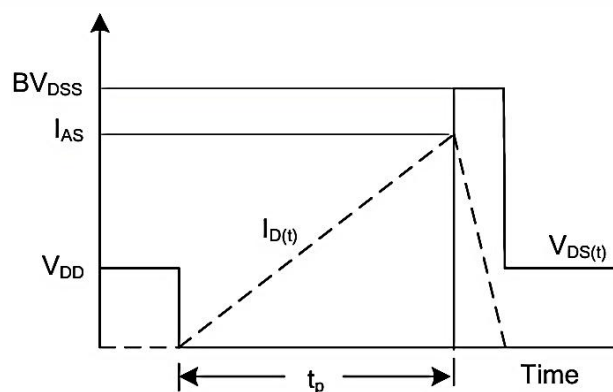
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

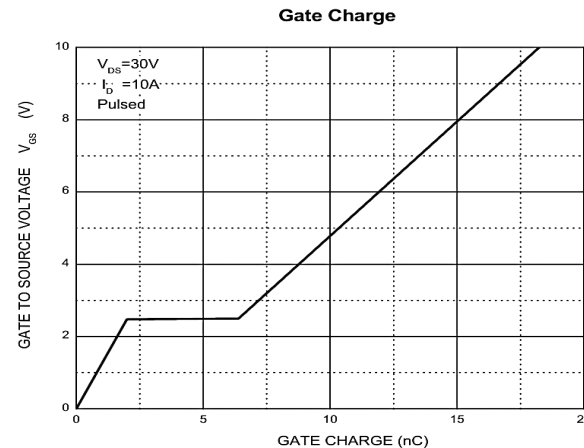
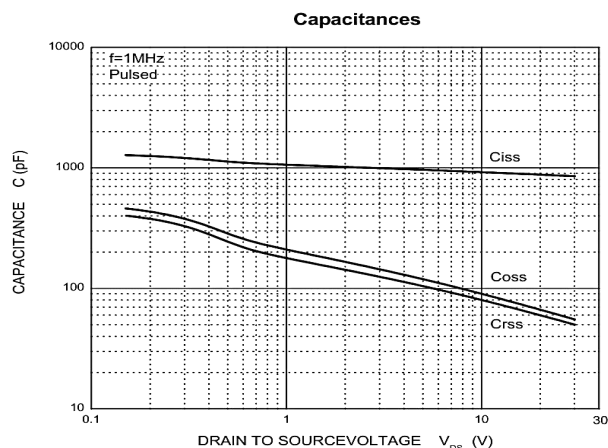
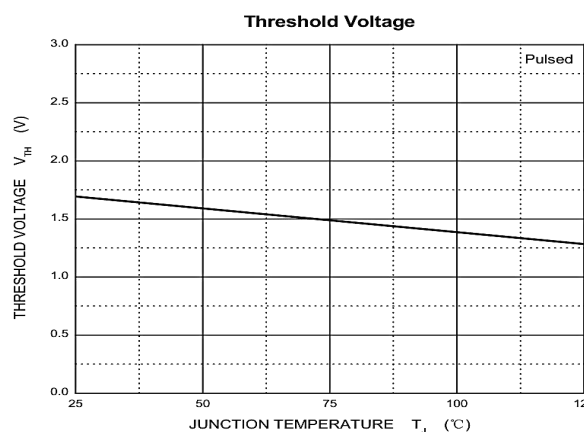
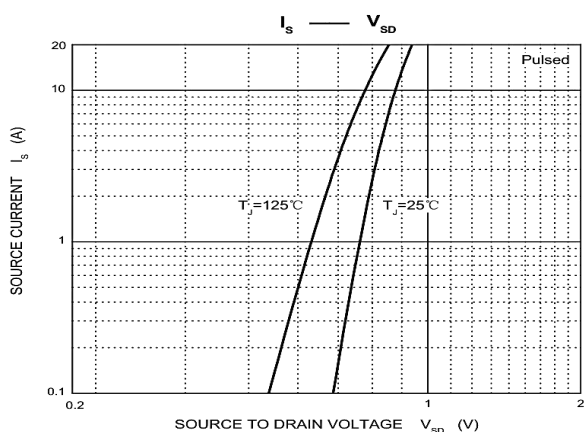
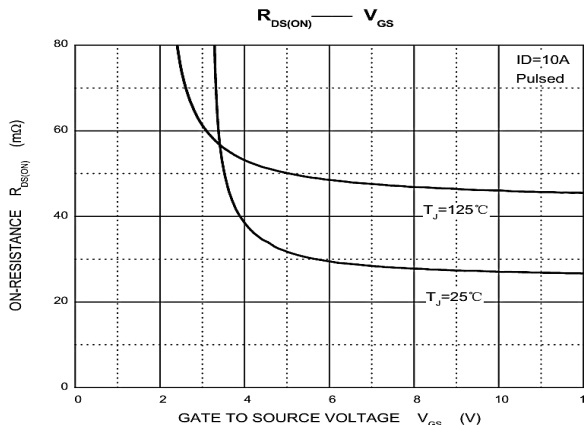
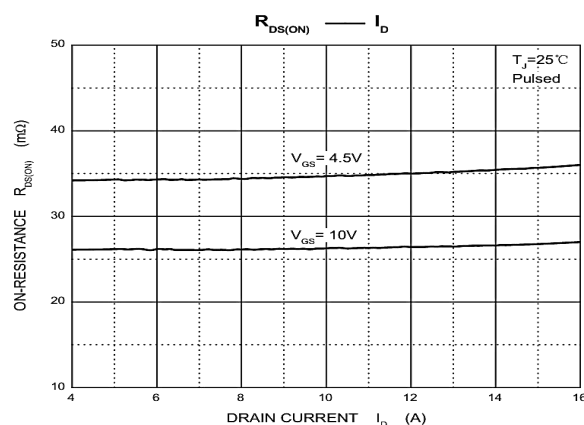
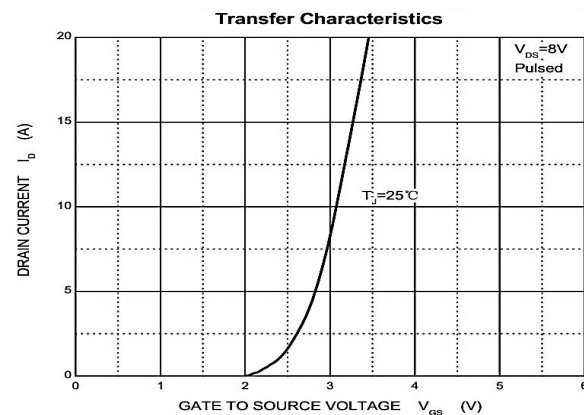
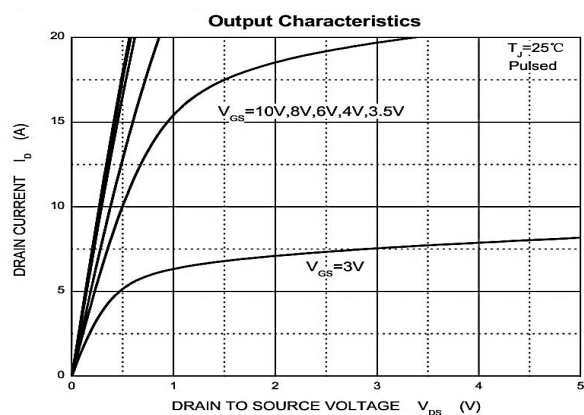


Unclamped Inductive Switching Waveforms

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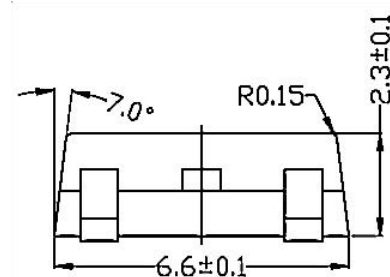
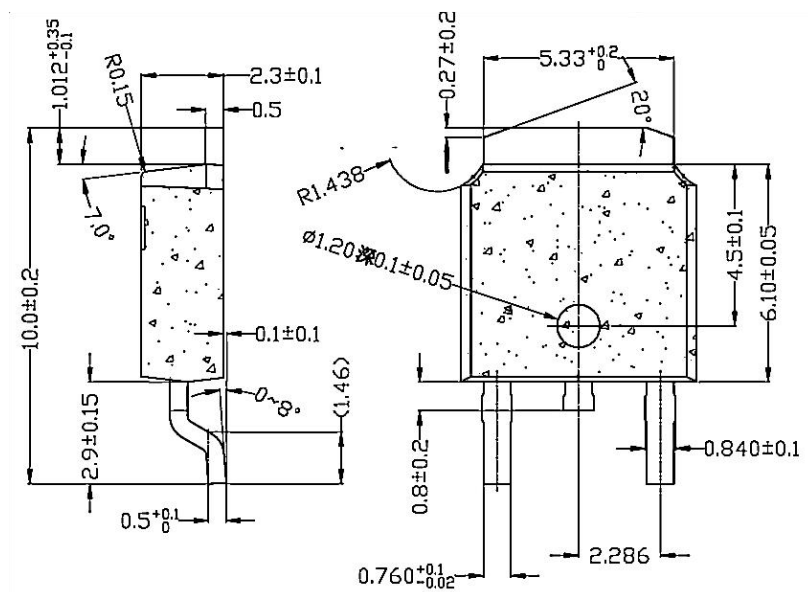
TYPICAL CHARACTERISTICS



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TO - 252 PACKAGE OUTLINE DIMENSIONS



TO - 252 PACKING INFORMATION

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