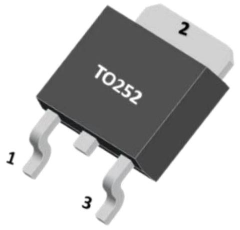
100A, 30V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

■ DESCRIPTION



The XD100N03Y uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

The XD100N03Y 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

■ APPLICATIONS

* Power switching application

■ MARKING

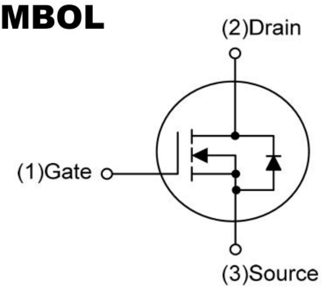
: HY LOGO

XD100N03Y=Device Code

XXXX=Date Code

Solid Dot=Green molding compound

SYMBOL



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

SYMBOL	PARAMETER		VALUE	UNIT
VDSS	Drain-Source Voltage		30	V
VGSS	Gate Source Voltage		±20	V
ID	Continuous Drain Current		100	A
IDM	Pulsed Drain Current (Note 2)		400	A
IAS	Single Pulsed Avalanche Current (Note 3)		35	A
EAS	Single Pulsed Avalanche Energy(Note 3)		875	mJ
PD	Power Dissipation	TO-220F	36	W
		TO-252	50	
TJ	Storage Temperature		150	°C
TSTG	Thermal Resistance Fr .0om Junction To Ambient		-55~150	°C

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.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-220F	θJA	62.5	°C/W
	TO-252		110	
Junction to Case	TO-220F	θJC	3.47	°C/W
	TO-252		2.5	

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

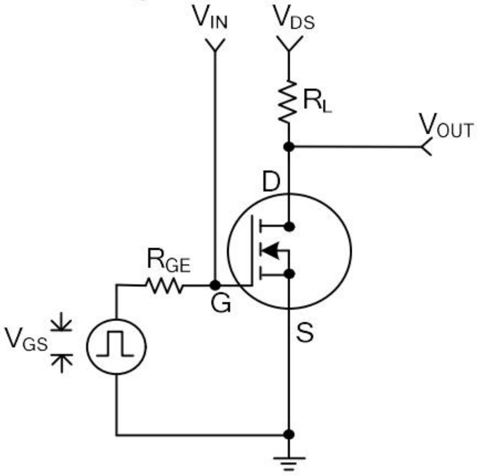
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	30			V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS(Note2)						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{DS}=VGS, I_D=250μA	1.0		3.0	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=50A		3.05	5.3	mΩ
		V_{GS}=4.5V, I_D=40A		4.2	8.0	mΩ
		V_{GS}=4.5V, I_D=40A		4.2	5.8	mΩ
DYNAMIC PARAMETERS(Note3)						
Input Capacitance	C_{ISS}	V_{DS}=15V, V_{GS}=0V f=1.0MHz		5200		pF
Output Capacitance	C_{OSS}			1040		
Reverse Transfer Capacitance	CRSS			900		
SWITCHING PARAMETERS(Note3)						
Total Gate Charge	Q_G	V_{DS}=15V, V_{GS}=5V I_D=16A (Note 1, 2)		81		nC
Gate Source Charge	Q_{GS}			20		
Gate Drain Charge	Q_{GD}			37		
Turn-ON Delay Time	$t_{D(ON)}$	V_{DD}=15V, I_D=16A R_G=6Ω V_{GS}=10V (Note 1, 2)		22		ns
Turn-ON Rise Time	t_R			25		
Turn-OFF Delay Time	$t_{D(OFF)}$			128		
Turn-OFF Fall-Time	tF			73		
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Current	I_S				90	A
Maximum Body-Diode Pulsed Current	I_{SM}				180	A
Drain-Source Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V			1.5	V

Notes: 1.Pulse Test : Pulse Width < 300μs, Duty Cycle < 2%.

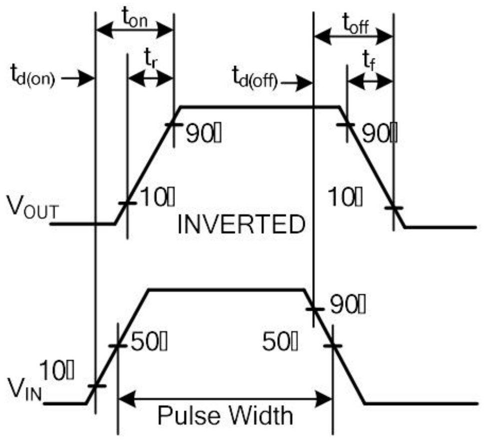
2.Guaranteed by design, not subject to production testing.

■ TEST CIRCUITS AND WAVEFORMS

Switching Time Test Circuit

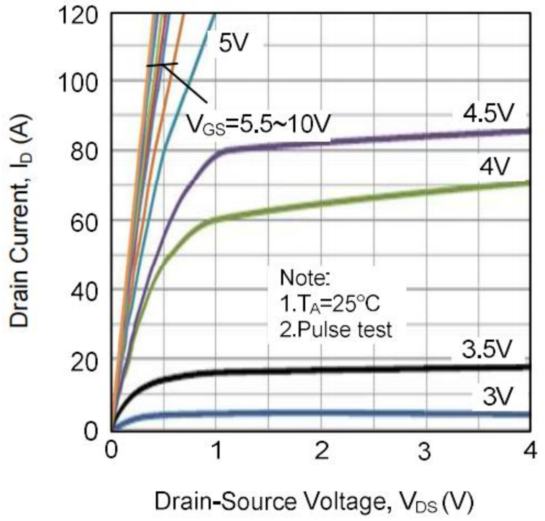


Switching Waveforms

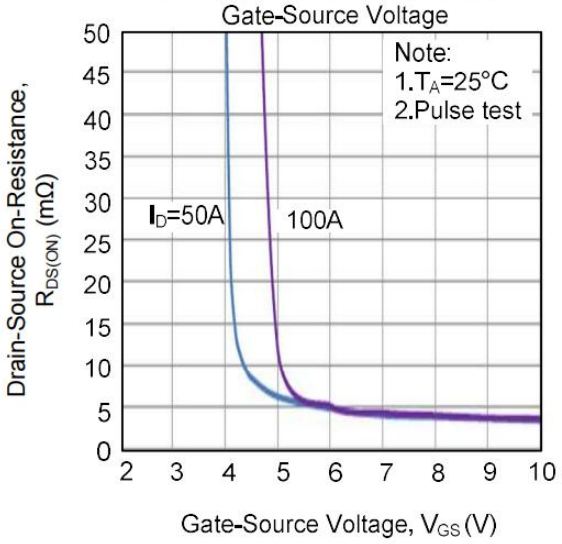


■ TYPICAL CHARACTERISTICS

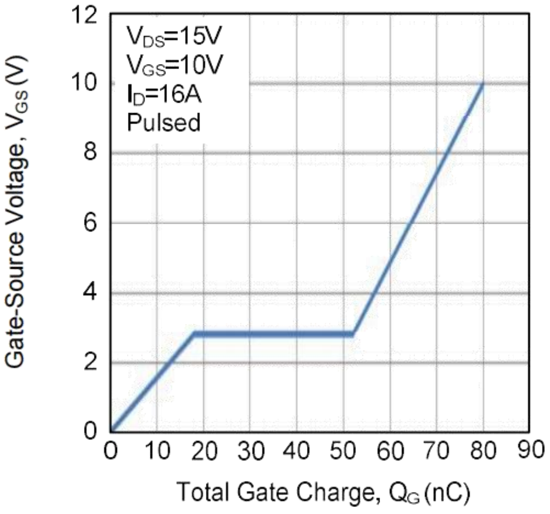
Drain Current vs. Drain-Source Voltage



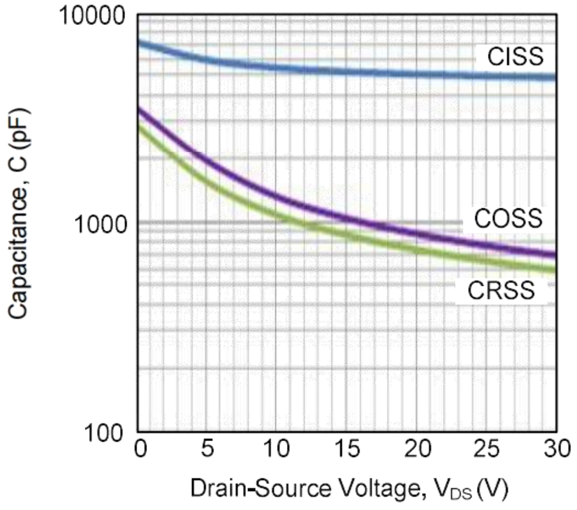
Drain-Source On-Resistance vs. Gate-Source Voltage



Gate Charge Characteristics

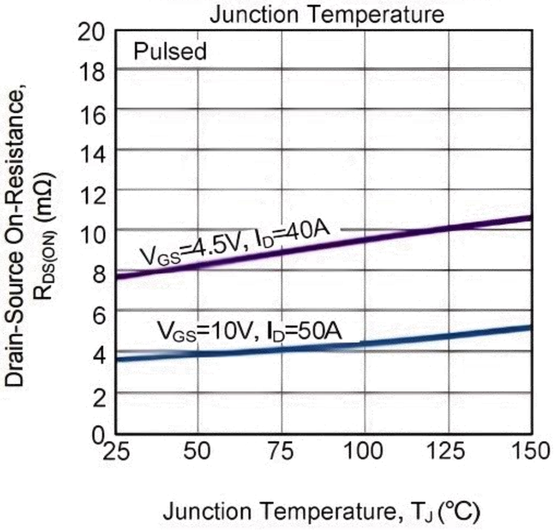


Capacitance Characteristics

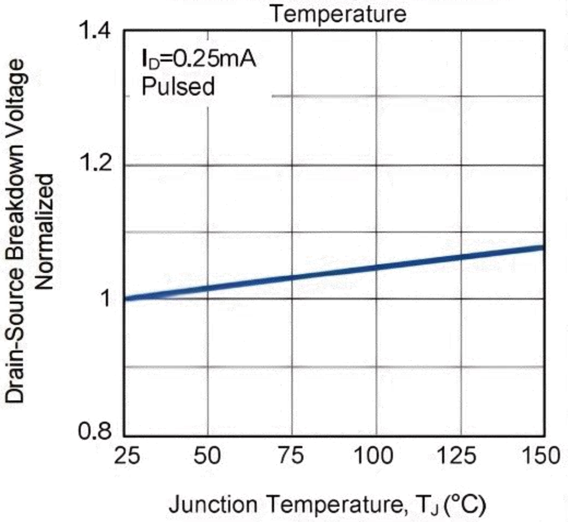


■ TYPICAL CHARACTERISTICS(Con.t)

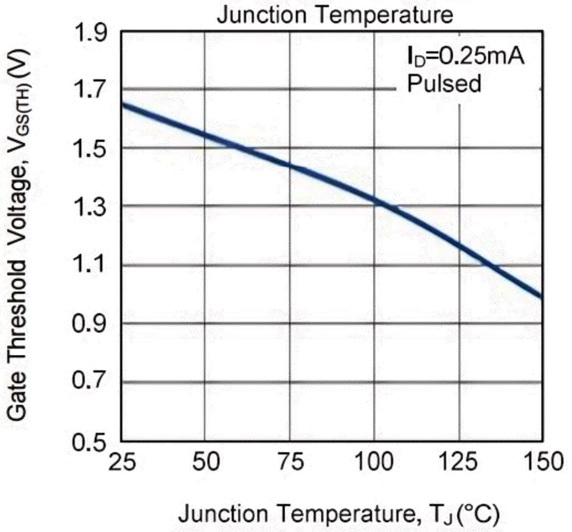
Drain-Source On-Resistance vs. Junction Temperature



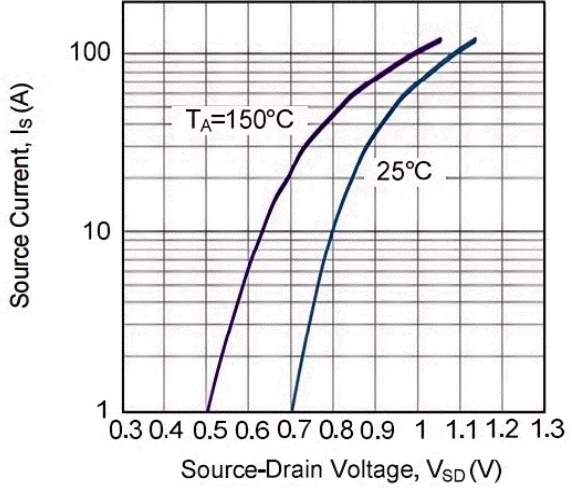
Breakdown Voltage vs. Junction Temperature



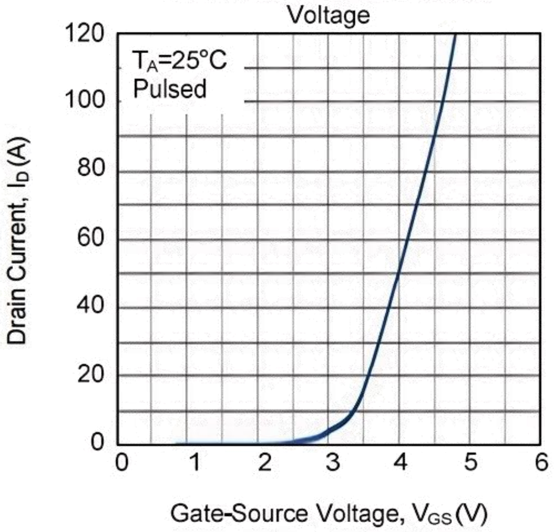
Gate Threshold Voltage vs. Junction Temperature



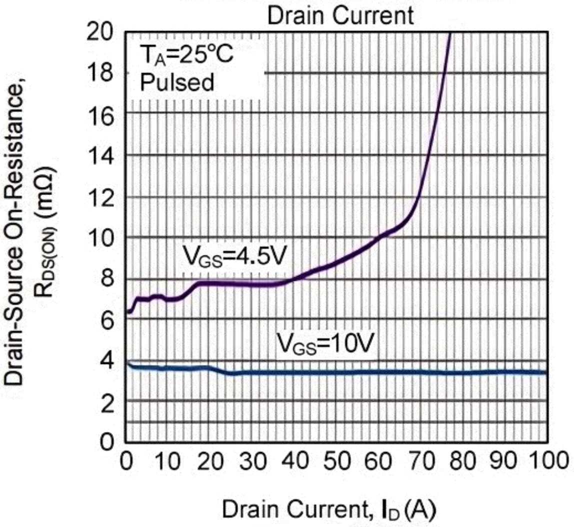
Source Current vs. Source-Drain Voltage



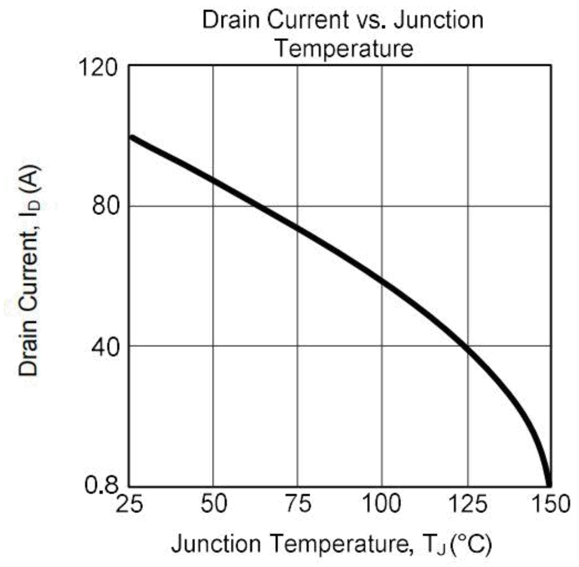
Drain Current vs. Gate-Source Voltage



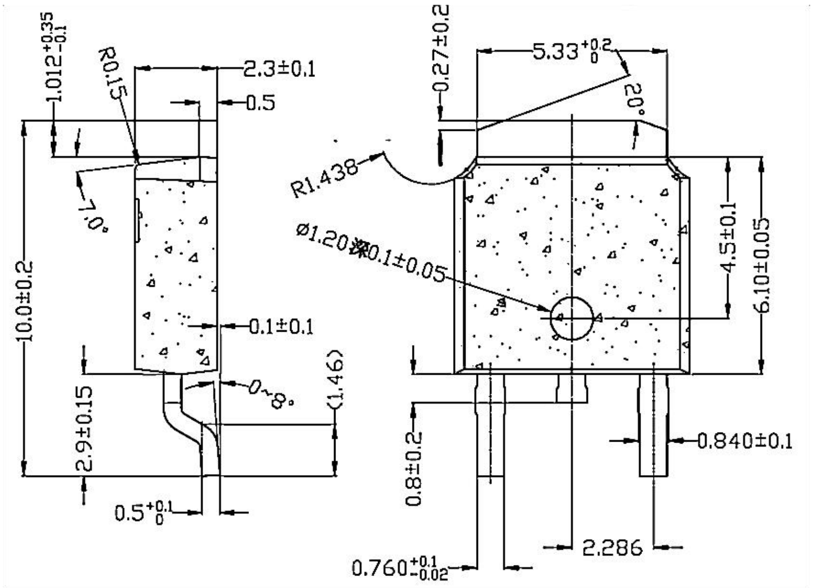
Drain-Source On-Resistance vs. Drain Current

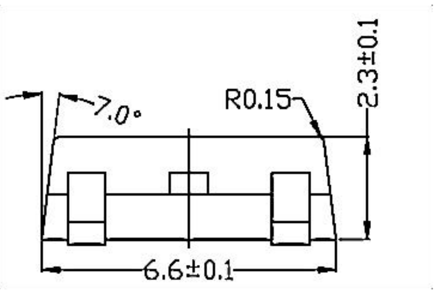


■ TYPICAL CHARACTERISTICS(Con.t)

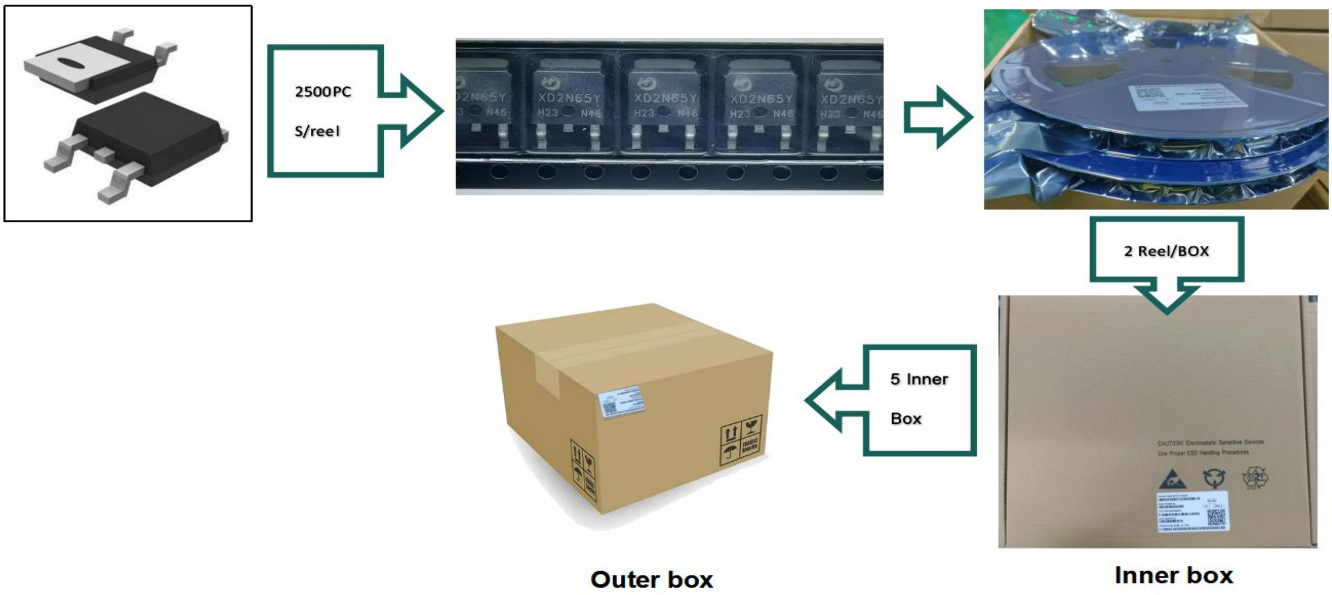


■ TO - 252 PACKAGE OUTLINE DIMENSIONS



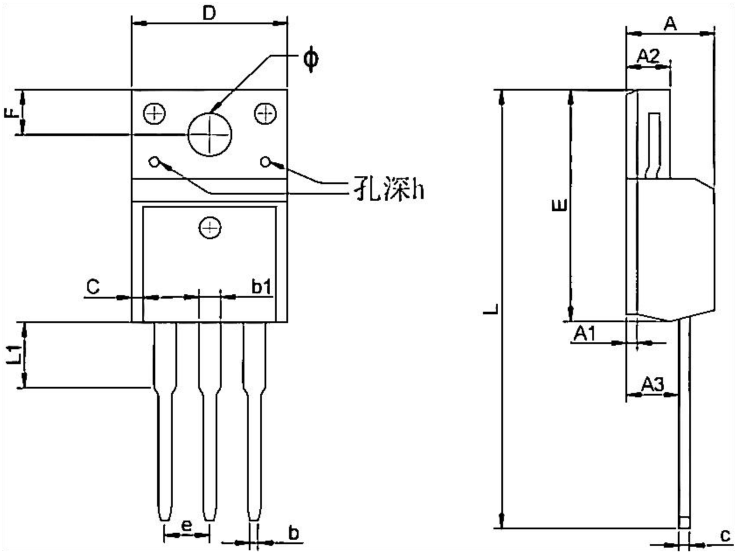


■ TO - 252 PACKING INFORMATION



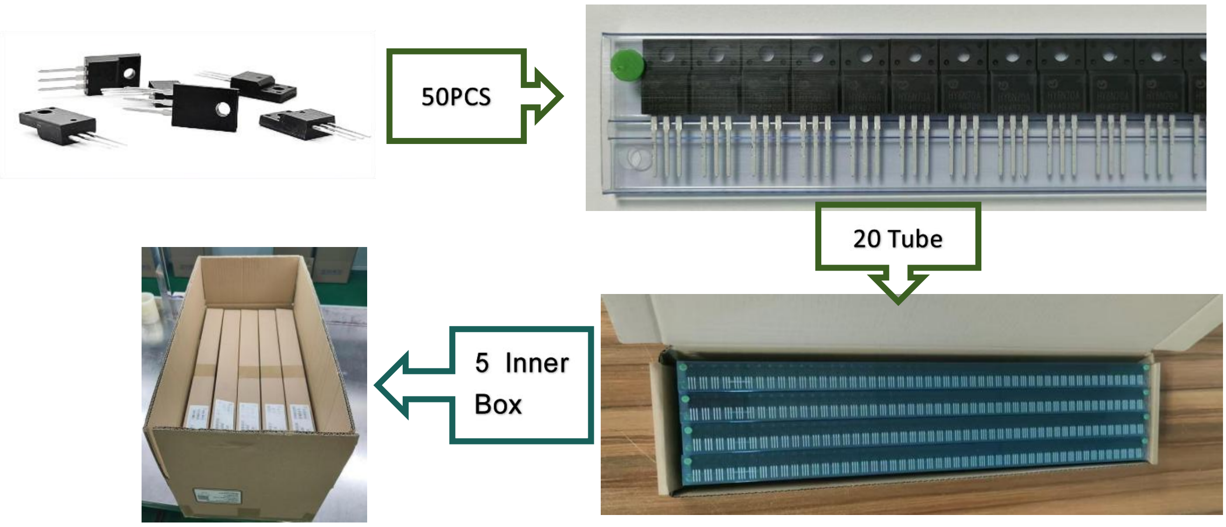
Package version	Reel dimensions Φ×H (mm)	Per Reel (pcs)	Reels per box	Inner box dimensions L×W×H(mm)	Outer box (pcs)	Outer box dimensions L×W×H (mm)
TO-252	Φ330*20	2500	2	360*340*50	25000	375*375*280

■ TO- 220F PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max	Min	M ax
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



Outer Box

Inner Box

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