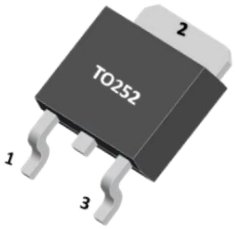
80A, 30V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

■ DESCRIPTION

The XD80N03Y uses advanced trench technology and design to provide excellent RDS(ON) with low gate charge. It can be used in a wide variety of applications.

The XD80N03Y meet the ROHS and Green Product requirement with full function reliability approved.



■ FEATURE

* High density cell design for ultra low RDS(ON)
* Fully characterized Avalanche voltage and current
* Good stability and uniformity with high EAS
* Excellent package for good heat dissipation
* Special process technology for high ESD capability

■ APPLICATIONS

* Power switching application
* Hard switched and high frequency circuits
* Uninterruptible Power Supply

■ MARKING

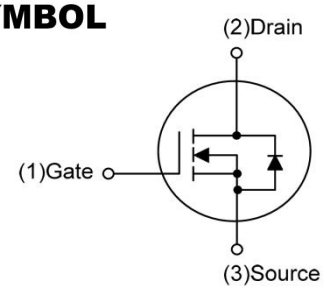
: HY LOGO

XD80N03Y=Device Code

XXXX=Date Code

Solid Dot=Green molding compound

SYMBOL



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

SYMBOL	PARAMETER		VALUE	UNIT
VDS	Drain-Source Voltage		30	V
VGS	Gate Source Voltage		±20	V
ID	Continuous Drain Current (Note 1)		80	A
IDM	Pulsed Drain Current (Note 2)		320	A
EAS	Single Pulsed Avalanche Energy(Note 3)		306	mJ
PD	Power Dissipation	TO-220F	70	W
		TO-252	83	
TJ	Storage Temperature		150	°C
TSTG	Thermal Resistance Fr .0om Junction To Ambient		-55~150	°C
TL	Lead Temperature for Soldering Purposes(1/8'' from case for 10s)		260	°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	1.78	°C/W
	TO-252		1.9	

■ 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
Zero gate voltage drain current	I_{DSS}	V_{DS}=30V, V_{GS}=0V			1	μA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V,			±100	nA
ON CHARACTERISTICS(Note 4)						
Static drain-source on-sate resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=40A	3.4	3.7	4.0	mΩ
		V_{GS}=4.6V, I_D=30A	5.5	6.3	7.0	
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS},I_D=250μA	1.0	1.4	3.0	V
Forward transconductance	g_{FS}	V_{DS} =5V, I_D =24A	20			S
DYNAMIC PARAMETERS(Note 4 5)						
Input Capacitance	C_{ISS}	V_{GS}=0V,V_{DS}=15V f=1.0MHz		2160		pF
Output Capacitance	C_{OSS}			272		pF
Reverse Transfer Capacitance	C_{RSS}			264		pF
SWITCHING PARAMETERS(Note 4 5)						
Total gate charge	Qg	V_{DS}=10V,V_{GS}=10V I_D=30A		44		nC
Gate-source charge	Qgs			6		
Gate-drain charge	Qgd			11		
Turn-On Delay Time	td(on)	V_{DD}=15V,I_D=30A V_{GS}=10V, R_G=2.7Ω		20		nS
Turn-On Rise time	tr			15		
Turn-Off Delay Time	td(off)			60		
Turn-Off Fall time	tf			10		

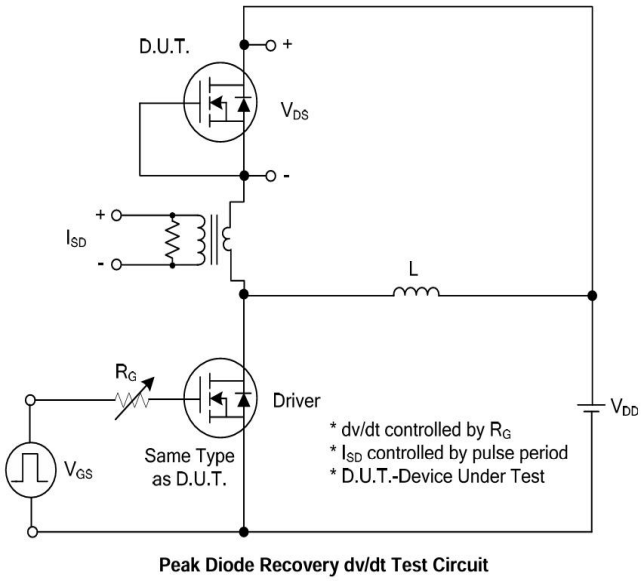
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Continuous drain-source diode forward current (Note 1)	I_S				80	A
Pulsed drain-source diode forward current (Note 2)	I_{SM}				320	A
Drain-source diode forward voltage(Note 4)	V_{SD}	I_S=24A,V_{GS}=0V			1.2	V

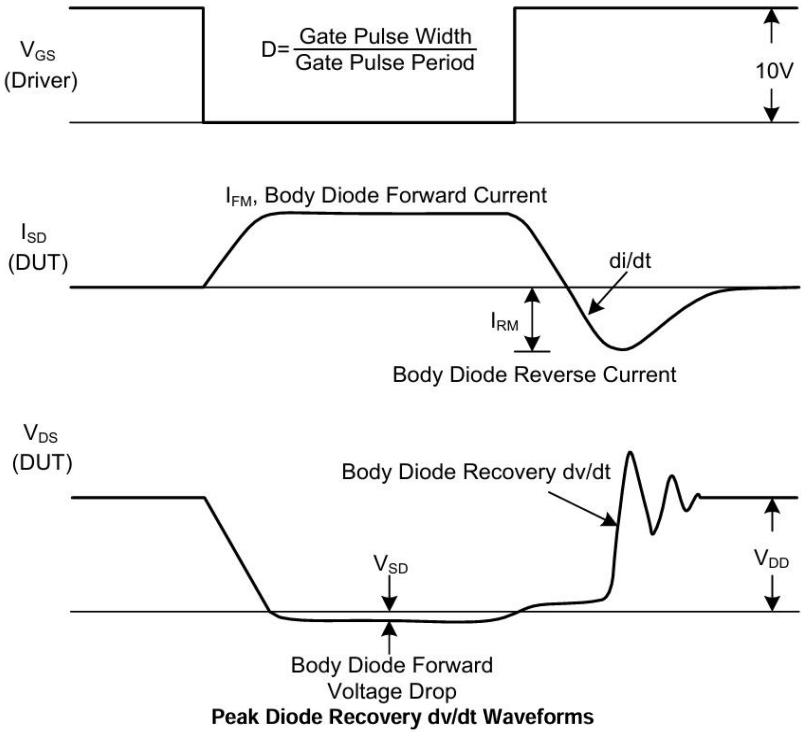
Notes:

1.T_C=25℃ Limited only by maximum temperature allowed.
2.Pw≤10μs, Duty cycle≤1%.
3.EAS condition: V_{DD}=30V,V_{GS}=10V, L=0.5mH, Rg=25Ω Starting T_J = 25°℃.
4.Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.
5.Guaranteed by design, not subject to production.

■ TEST CIRCUITS AND WAVEFORMS

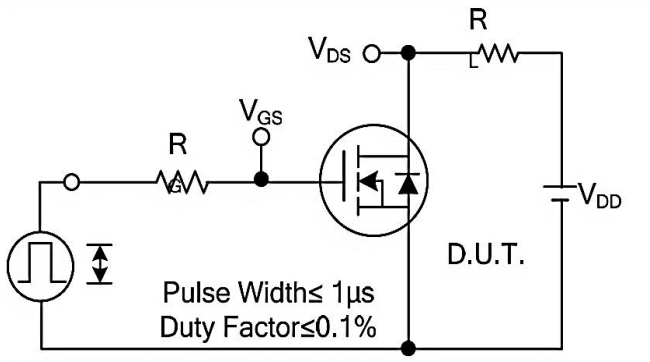


Peak Diode Recovery dv/dt Test Circuit

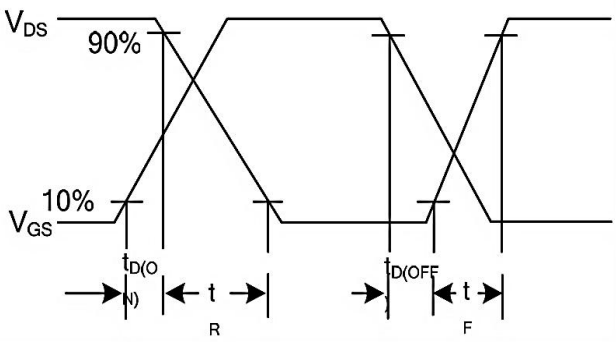


Peak Diode Recovery dv/dt Waveforms

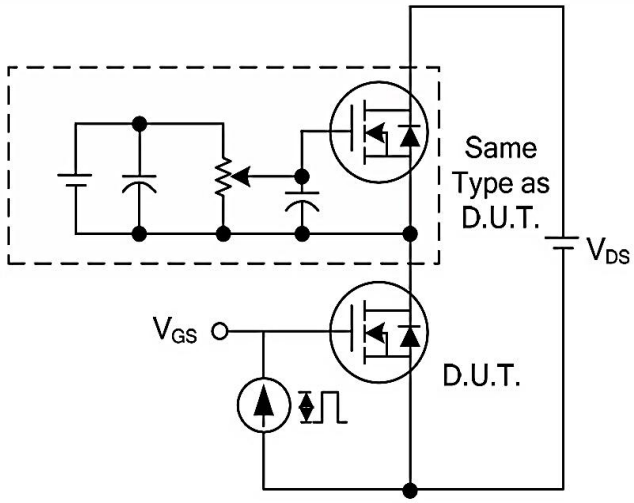
■ TEST CIRCUITS AND WAVEFORMS(Con.t)



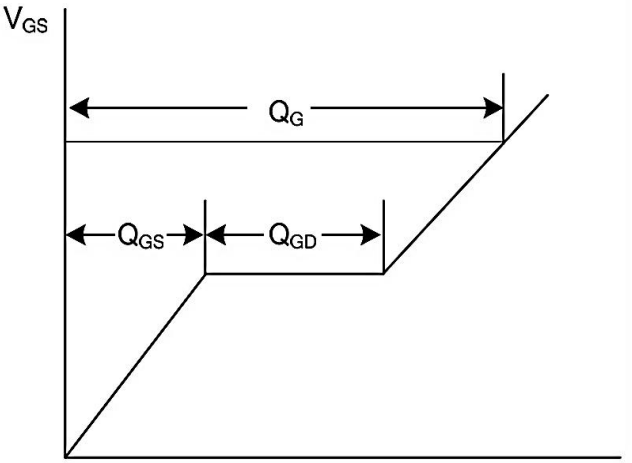
Switching Test Circuit



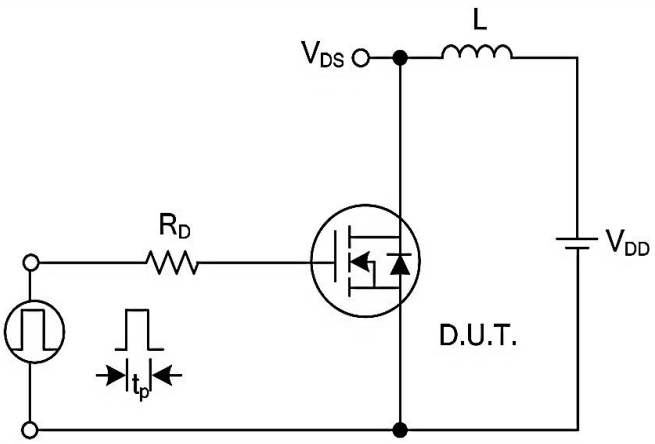
Switching Waveforms



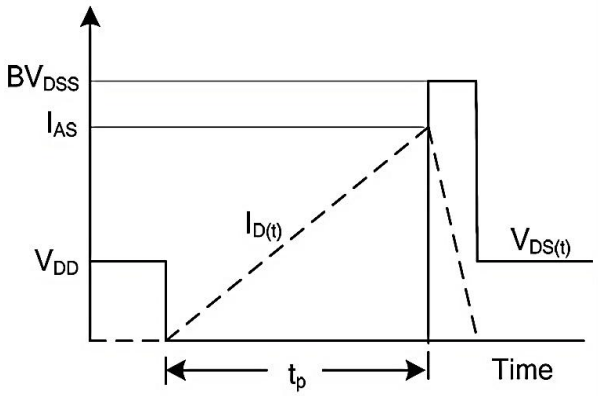
Gate Charge Test Circuit



Charge
Gate Charge Waveform



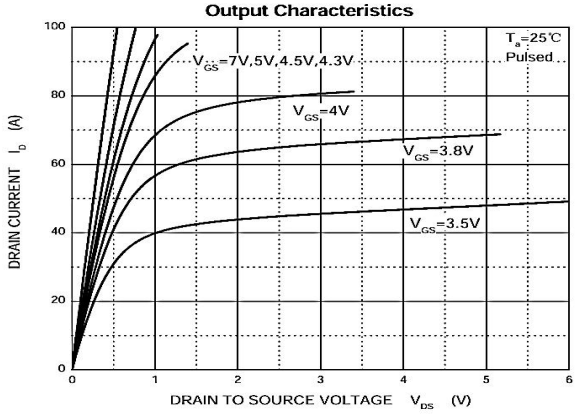
Unclamped Inductive Switching Test Circuit



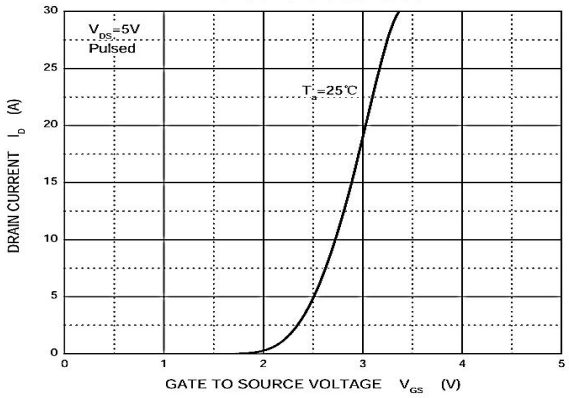
Unclamped Inductive Switching Waveforms

■ TYPICAL CHARACTERISTICS

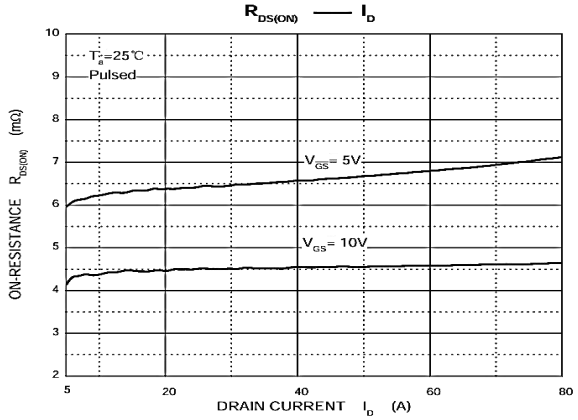
Output Characteristics



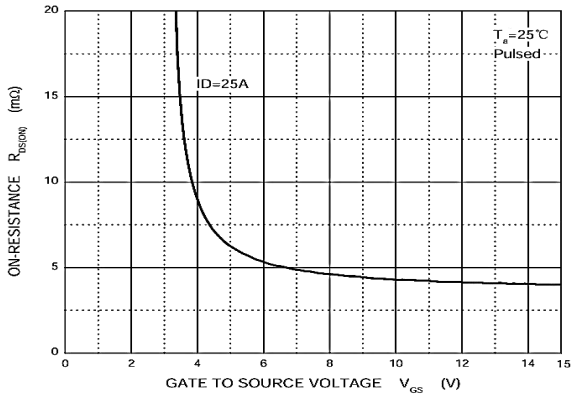
Transfer Characteristics



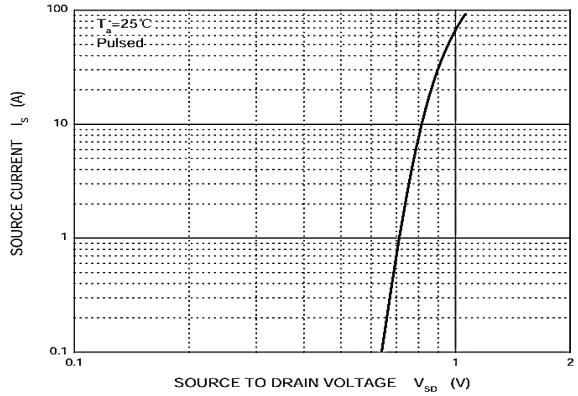
$R_{DS(ON)}$ —— I_D



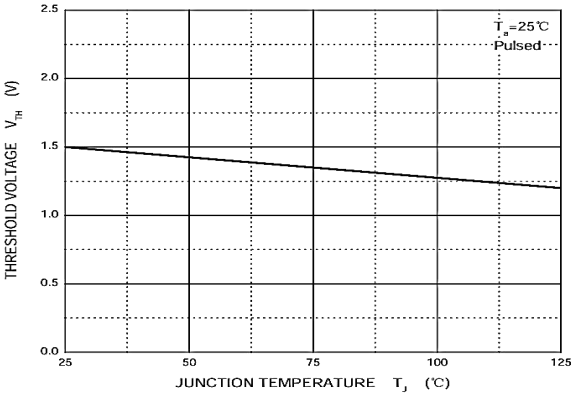
$R_{DS(ON)}$—— V_{GS}



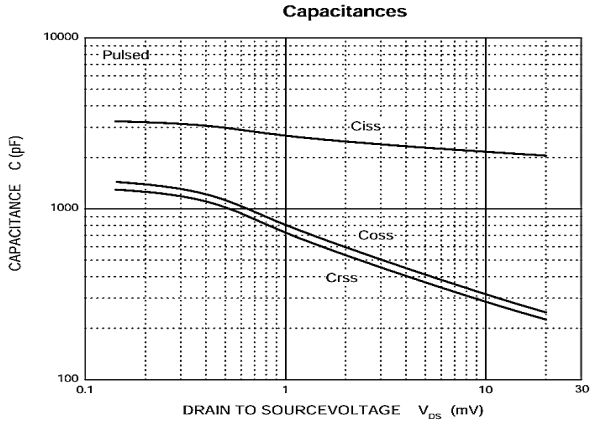
I_S —— V_{SD}



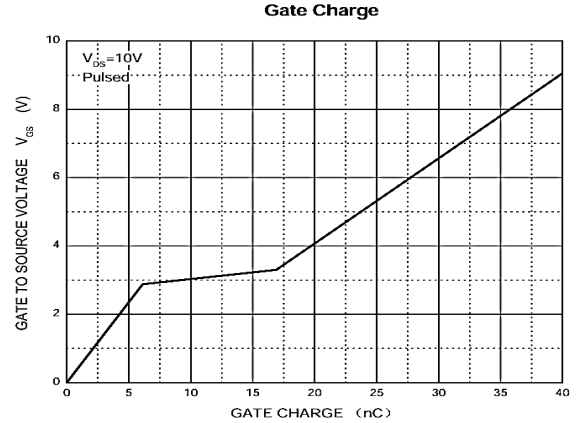
Threshold Voltage



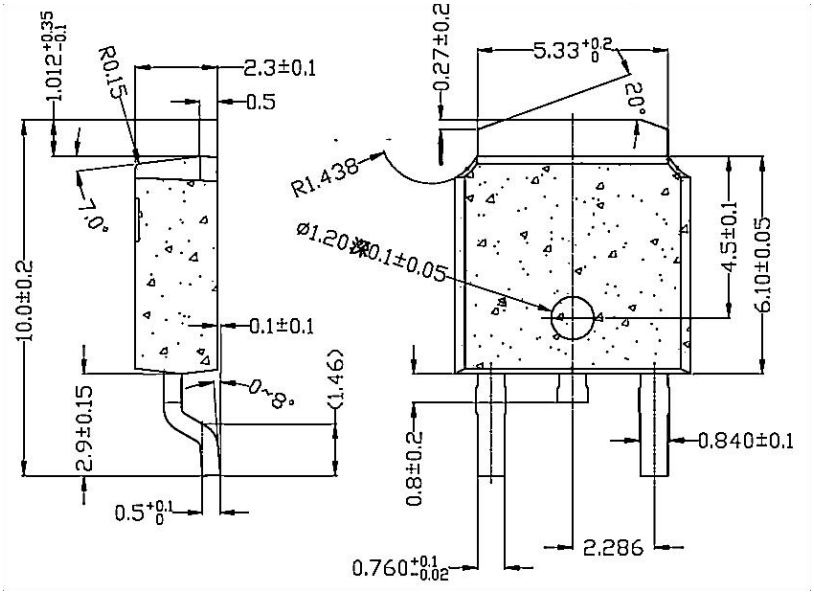
Capacitances

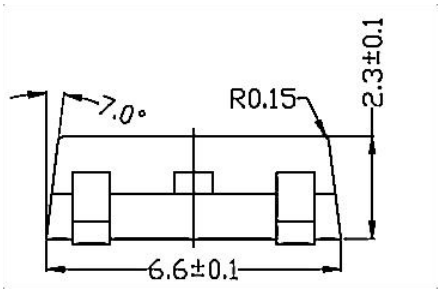


Gate Charge

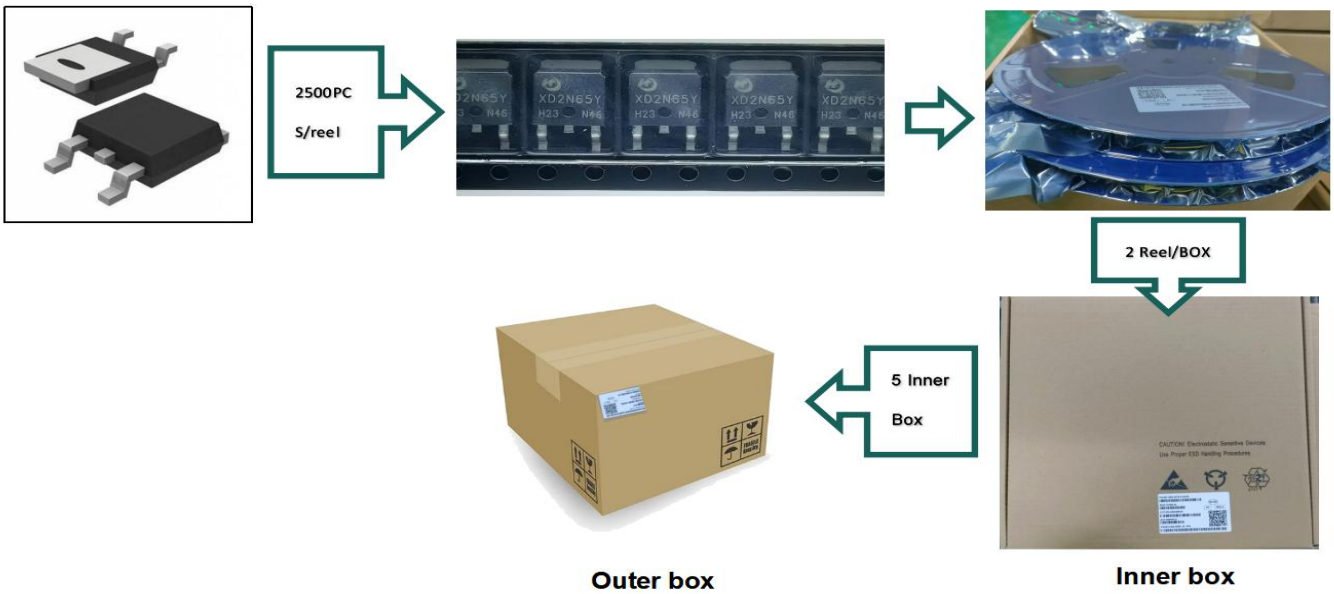


■ TO - 252 PACKAGE OUTLINE DIMENSIONS



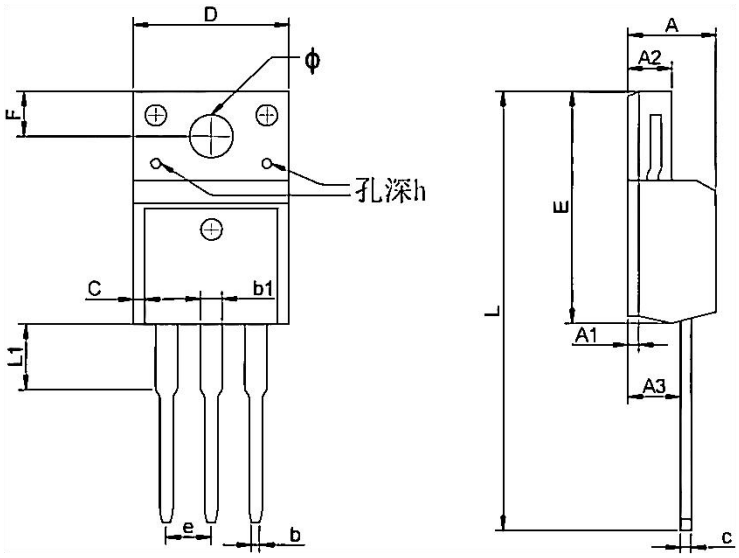


■ TO - 252 PACKING INFORMATION



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	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

5 Inner Box

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