

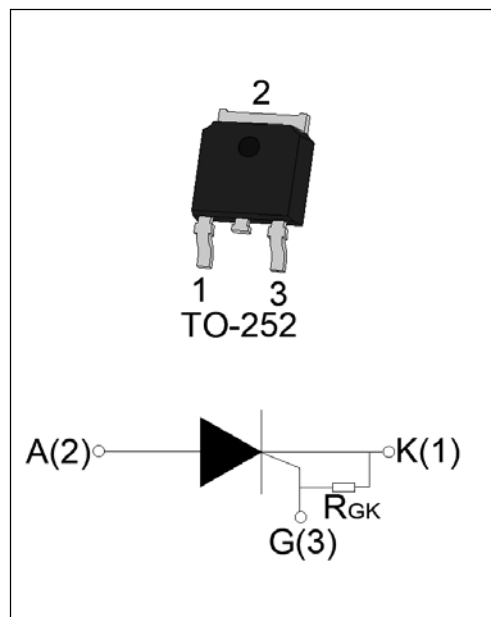


### DESCRIPTION:

The C106M SCR with the parallel resistor between Gate and Cathode,  $R_{GK}=10\sim 80k\Omega$ , is especially recommended for use on straight hair, igniter, anion generator, etc. Package TO-252 is RoHS compliant.

### MAIN FEATURES

Symbol	Value	Unit
$I_{T(RMS)}$	2	A
$V_{DRM}/V_{RRM}$	600	V
$I_{GT}$	$\leq 200$	$\mu A$



### ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Storage junction temperature range	$T_{stg}$	-40-150	$^{\circ}C$
Operating junction temperature range	$T_j$	-40-125 <sup>①</sup>	$^{\circ}C$
Repetitive peak off-state voltage ( $T_j=25^{\circ}C$ )	$V_{DRM}$	600	V
Repetitive peak reverse voltage ( $T_j=25^{\circ}C$ )	$V_{RRM}$	600	V
Average on-state current ( $T_c \leq 104^{\circ}C$ )	$I_{T(AV)}$	1.3	A
RMS on-state current ( $T_c \leq 104^{\circ}C$ )	$I_{T(RMS)}$	2	A
Non repetitive surge peak on-state current ( $t_p=10ms, T_j=25^{\circ}C$ )	$I_{TSM}$	20	A
Non repetitive surge peak on-state current ( $t_p=8.3ms, T_j=25^{\circ}C$ )		22	
$I^2t$ value for fusing ( $t_p=10ms, T_j=25^{\circ}C$ )	$I^2t$	2	$A^2s$
Critical rate of rise of on-state current ( $I_G=2 \times I_{GT}, f=100Hz, T_j=125^{\circ}C$ )	$di/dt$	50	$A/\mu s$
Peak gate current ( $t_p=20\mu s, T_j=125^{\circ}C$ )	$I_{GM}$	1.2	A
Average gate power dissipation ( $T_j=125^{\circ}C$ )	$P_{G(AV)}$	0.2	W
Peak gate power	$P_{GM}$	2	W

Peak pulse voltage ( $T_j=25^{\circ}\text{C}$ ; non-repetitive, off-state; FIG.8)	$V_{pp}$	0.5	kV
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**NOTE 1:** When we parallel connect a  $\leq 1\text{K}\Omega$  resistor between Gate and Cathode, the  $T_j$  can reach  $125^{\circ}\text{C}$ ; if without this resistor, the  $T_j$  only can reach  $110^{\circ}\text{C}$ .

### ELECTRICAL CHARACTERISTICS ( $T_j=25^{\circ}\text{C}$ unless otherwise specified)

Symbol	Test Condition	Value			Unit
		MIN.	TYP.	MAX.	
$I_{GT}$	$V_D=12\text{V}$ $R_L=33\Omega$	-	40	200	$\mu\text{A}$
$V_{GT}$		-	0.5	0.8	V
$V_{GD}$	$V_D=V_{DRM}$ $T_j=125^{\circ}\text{C}$	0.2	-	-	V
$I_L$	$I_G=1.2 I_{GT}$	-	-	3	mA
$I_H$	$I_T=0.1\text{A}$	-	-	2	mA
dV/dt	$V_D=400\text{V}$ $T_j=125^{\circ}\text{C}$ $R_{GK}=1\text{K}\Omega$	50	-	-	V/ $\mu\text{s}$
	$V_D=400\text{V}$ $T_j=125^{\circ}\text{C}$ $R_{GK}=220\Omega$	250	-	-	
$t_{on}$	$I_G=10\text{mA}$ $I_A=20\text{mA}$ $I_R=2\text{mA}$	-	2	-	$\mu\text{s}$
$t_{off}$	$T_j=25^{\circ}\text{C}$	-	50	-	$\mu\text{s}$

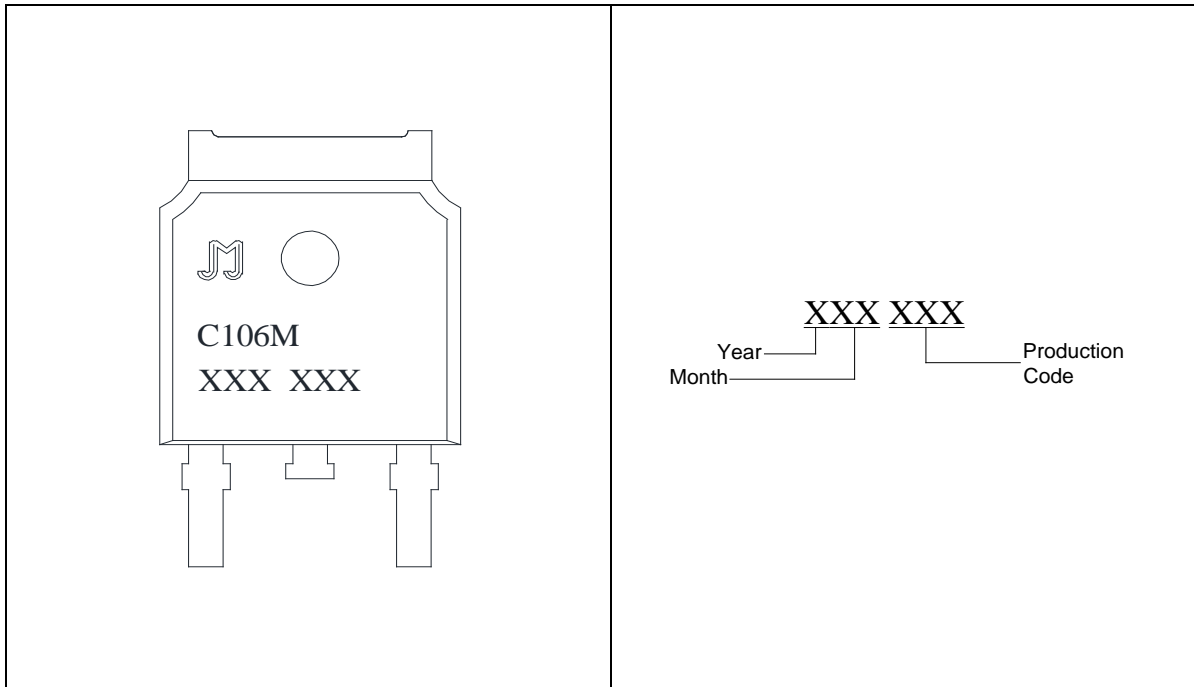
### STATIC CHARACTERISTICS

Symbol	Parameter		Value(MAX.)	Unit
$V_{TM}$	$I_{TM}=4\text{A}$ $t_p=380\mu\text{s}$	$T_j=25^{\circ}\text{C}$	1.5	V
$V_{TO}$	Threshold voltage	$T_j=125^{\circ}\text{C}$	0.73	V
$R_D$	Dynamic resistance	$T_j=125^{\circ}\text{C}$	0.14	$\Omega$
$I_{DRM}$	$V_D=V_{DRM}$ $V_R=V_{RRM}$	$T_j=25^{\circ}\text{C}$	5	$\mu\text{A}$
$I_{RRM}$		$T_j=125^{\circ}\text{C}$	0.2	mA

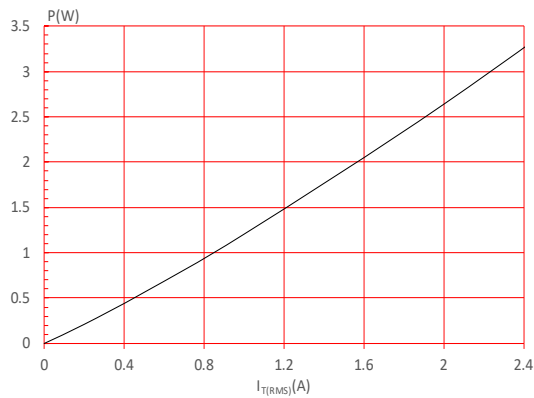
### THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	junction to case (DC)	8	$^{\circ}\text{C}/\text{W}$
$R_{th(j-a)}$	junction to ambient (DC)	70	$^{\circ}\text{C}/\text{W}$

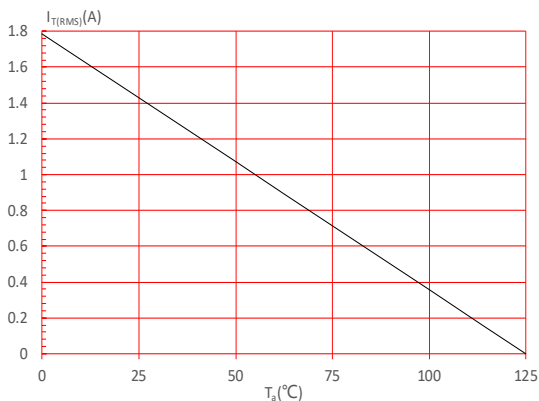
MARKING



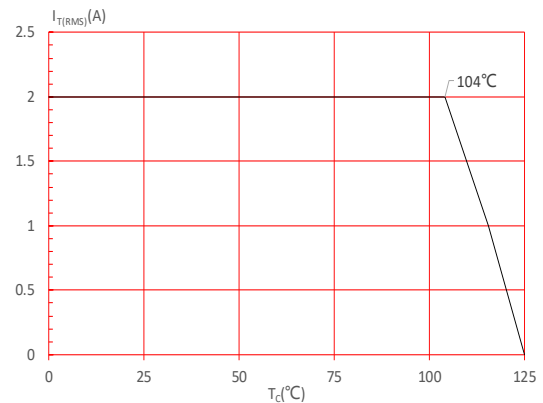
**FIG.1** Maximum power dissipation versus RMS on-state current



**FIG.3:** RMS on-state current versus ambient temperature (printed circuit board FR4,copper thickness:35 $\mu$ m)(full cycle)



**FIG.2:** RMS on-state current versus case temperature



**FIG.4:** Surge peak on-state current versus number of cycles

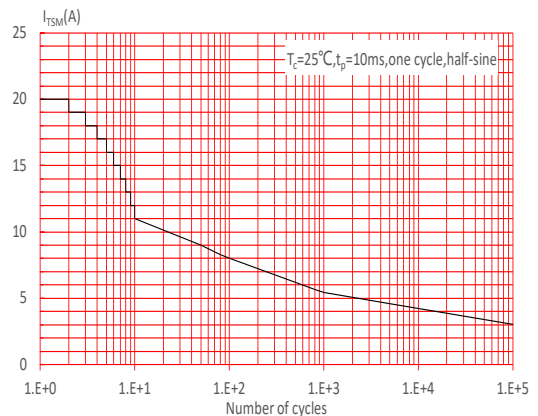


FIG.5: On-state characteristics

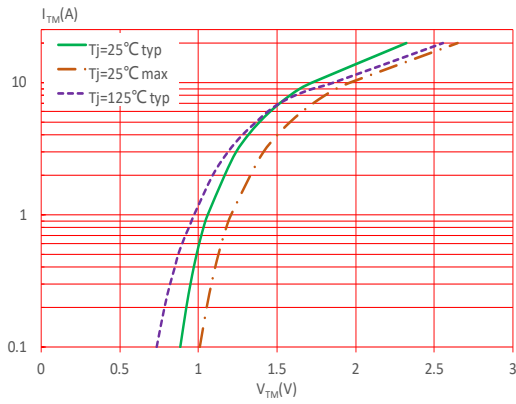


FIG.6: Non-repetitive surge peak on-state current for a sinusoidal pulse with width  $t_p < 10\text{ms}$ , and corresponding value of  $I^2t$  ( $di/dt < 50\text{A}/\mu\text{s}$ )

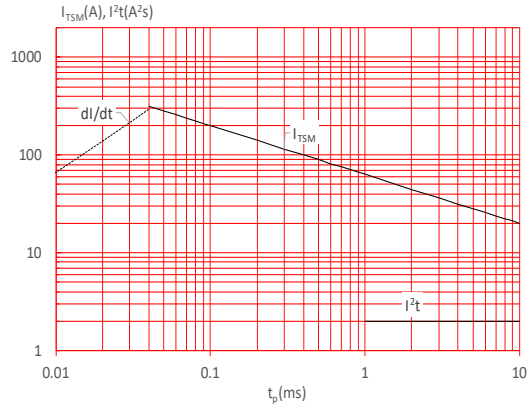


FIG.7: Relative variations of gate trigger current, holding current and latching current versus junction temperature

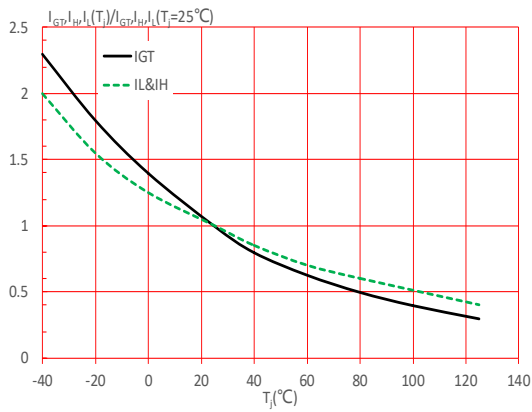
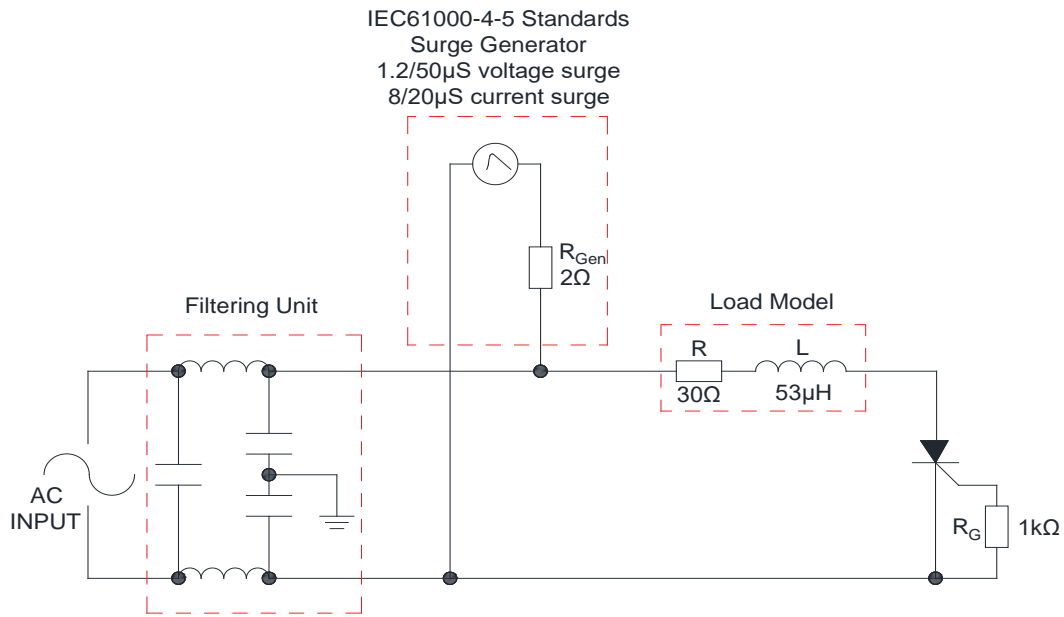
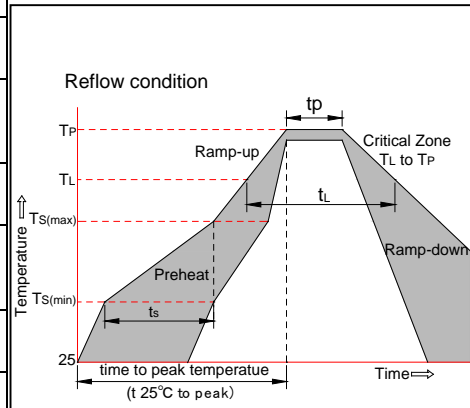


FIG.8: Test circuit for inductive and resistive loads to IEC-61000-4-5 standards



**SOLDERING PARAMETERS**

Reflow Condition		Pb-Free assembly (see figure at right)
Pre Heat	-Temperature Min ( $T_{s(min)}$ )	+150°C
	-Temperature Max( $T_{s(max)}$ )	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak)		3°C/sec. Max
$T_{s(max)}$ to $T_L$ - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature( $T_L$ ) (Liquidus)	+217°C
	-Temperature( $t_L$ )	60-150 secs.
Peak Temp ( $T_p$ )		+260(+0/-5)°C
Time within 5°C of actual Peak Temp ( $t_p$ )		20-40secs.
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp ( $T_p$ )		8 min. Max
Do not exceed		+260°C



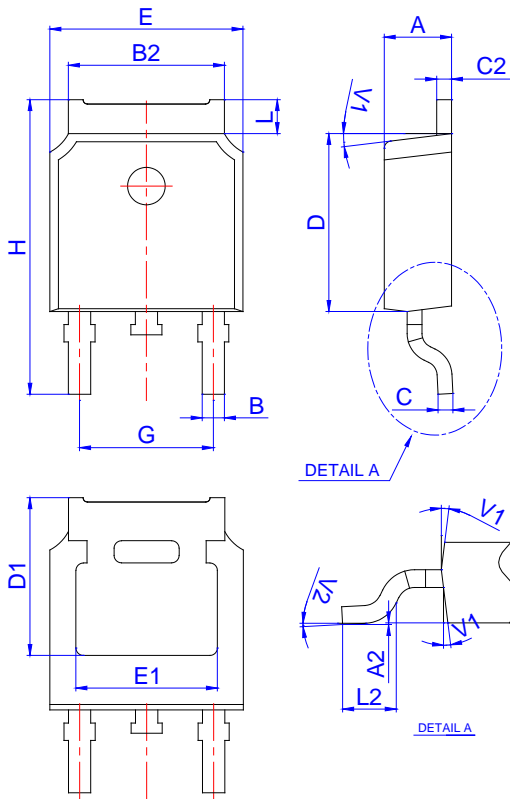
**ORDERING INFORMATION**

Order code	Voltage $V_{DRM}/V_{RRM}$ (V)	IGT( $\mu$ A)	Package	Base qty. (pcs)	Delivery mode
C106M	600	$\leq 200$	TO-252	80	Tube
C106M-TR					Tape & Reel

**Document Revision History**

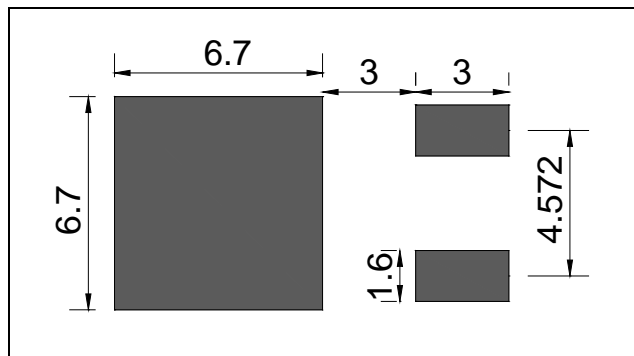
Date	Revision	Changes
Apr.10, 2023	A.1.0	Last update

**PACKAGE MECHANICAL DATA**

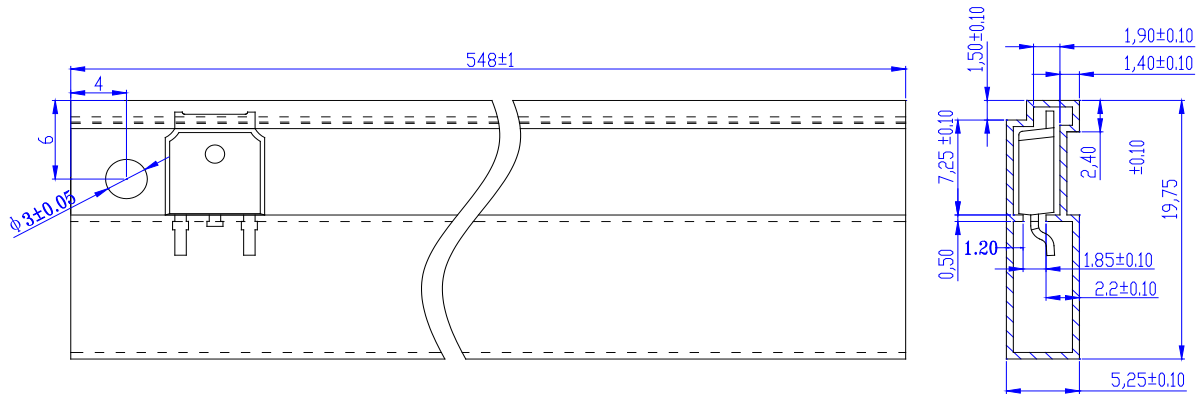


Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.10		5.50	0.201		0.217
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	0.95		1.30	0.037		0.051
L2	1.35		1.75	0.053		0.069
V1		7°			7°	
V2	0°		6°	0°		6°

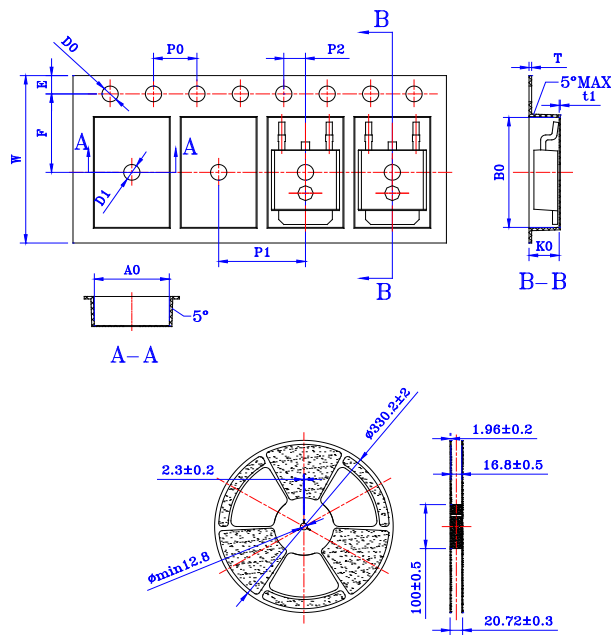
**FOOTPRINT-TO-252 (dimensions in mm)**



DELIVERY MODE



PACKAGE	OUTLINE	TUBE (PCS)	INNER BOX (PCS)	PER CARTON
TO-252	TUBE	80	4,000	20,000




Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
W	15.90	16.00	16.10	0.626	0.630	0.634
E	1.65	1.75	1.85	0.065	0.069	0.073
F	7.40	7.50	7.60	0.291	0.295	0.299
D0	1.50	1.55	1.60	0.059	0.060	0.063
D1	1.50	-	-	0.059	-	-
P0	3.90	4.00	4.10	0.154	0.157	0.161
P1	7.90	8.00	8.10	0.311	0.315	0.319
P2	1.90	2.00	2.10	0.075	0.079	0.083
10P0	39.80	40.00	40.20	1.567	1.575	1.583
A0	6.80	6.90	7.00	0.267	0.272	0.276
B0	10.40	10.50	10.60	0.408	0.413	0.417
K0	2.60	2.70	2.80	0.102	0.106	0.110
T	0.25	0.30	0.35	0.010	0.012	0.014
t1	0.10	-	-	0.004	-	-

PACKAGE	OUTLINE	REEL (PCS)	PER CARTON (PCS)	TAPE & REEL
TO-252	TAPING	2,500	25,000	13 inch



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