

TM10N06D

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

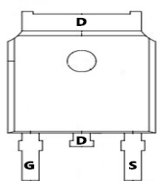
General Features

$V_{DS} = 60V$ $I_D = 10A$
 $R_{DS(ON)} = 65 m\Omega (typ.) @ V_{GS} = 10V$

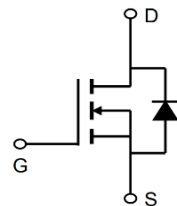
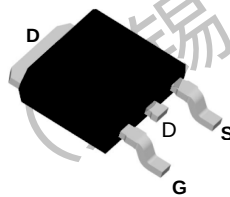
100% UIS Tested
100% R_g Tested



D:TO-252-3L



Marking: 10N06



Absolute Maximum Ratings ($T_C = 25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	10	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	6.2	A
I_{DM}	Pulsed Drain Current ²	22	A
$P_D @ T_A = 25^\circ C$	Total Power Dissipation ³	1.2	W
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-ambient ¹	---	62	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	6.6	$^\circ C/W$

TM10N06D

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Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Parameter						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$	-	-	1	μA
		$V_{DS}=60V, V_{GS}=0V, T_J=150^{\circ}C$	-	-	100	
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.9	1.65	2	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=3A$	-	65	74	m Ω
		$V_{GS}=4.5V, I_D=3A$	-	75	92	
Diode Forward Voltage	V_{SD}	$I_S=3A, V_{GS}=0V$	-	0.85	1.2	V
Gate resistance	R_G	f=1MHz, Open drain	-	2	-	Ω
Maximum Body-Diode Continuous Current	I_S		-	-	10	A
Dynamic Parameters						
Input Capacitance	C_{iss}	$V_{DS}=30V, V_{GS}=0V, f=1MHz$	-	400	-	pF
Output Capacitance	C_{oss}		-	28	-	
Reverse Transfer Capacitance	C_{rss}		-	22	-	
Switching Parameters						
Total Gate Charge	Q_g	$V_{GS}=10V, V_{DS}=30V, I_D=3A$	-	10	-	nC
Gate-Source Charge	Q_{gs}		-	1.7	-	
Gate-Drain Charge	Q_{gd}		-	2.1	-	
Reverse Recovery Charge	Q_{rr}	$I_F=3A, di/dt=100A/us$	-	7	-	nC
Reverse Recovery Time	t_{rr}		-	33	-	ns
Turn-on Delay Time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=30V, R_L=20\Omega$ $R_{GEN}=3\Omega$	-	3.6	-	ns
Turn-on Rise Time	t_r		-	17.6	-	
Turn-off Delay Time	$t_{D(off)}$		-	13	-	
Turn-off fall Time	t_f		-	23	-	

A. Repetitive rating; pulse width limited by max. junction temperature.

B. P_d is based on max. junction temperature, using junction-case thermal resistance.

C. The value of $R_{\theta JA}$ is measured with the device mounted on the minimum recommend pad size, in the still air environment with $T_A=25^{\circ}\text{C}$. The maximum allowed junction temperature of 150°C . The value in any given application depends on the user's specific board design.

TM10N06D

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Typical Electrical and Thermal Characteristics Diagrams

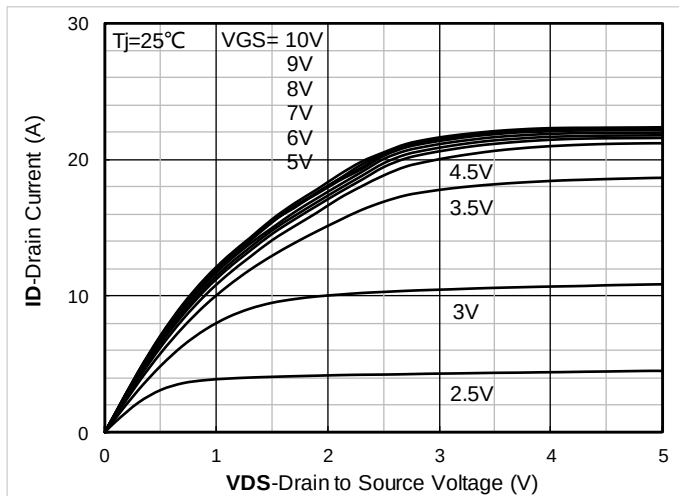


Figure 1. Output Characteristics

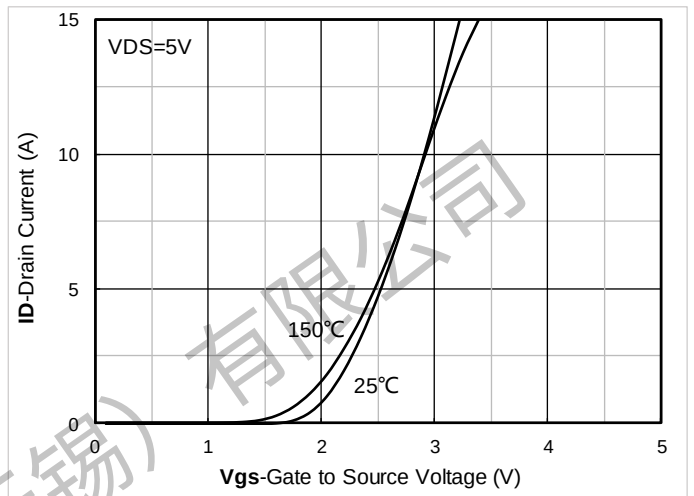


Figure 2. Transfer Characteristics

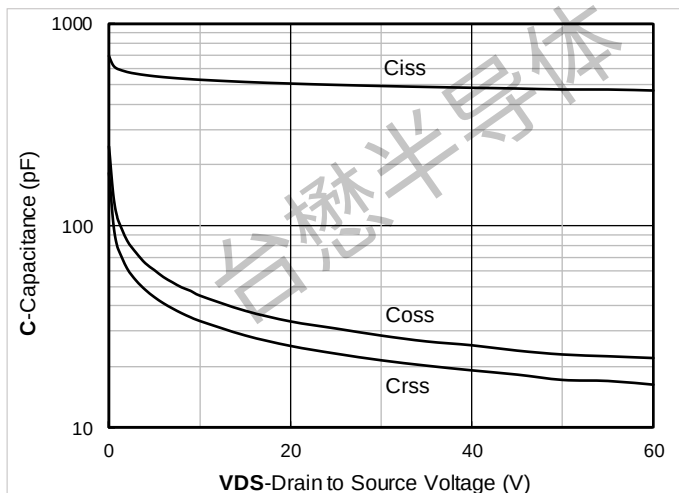


Figure 3. Capacitance Characteristics

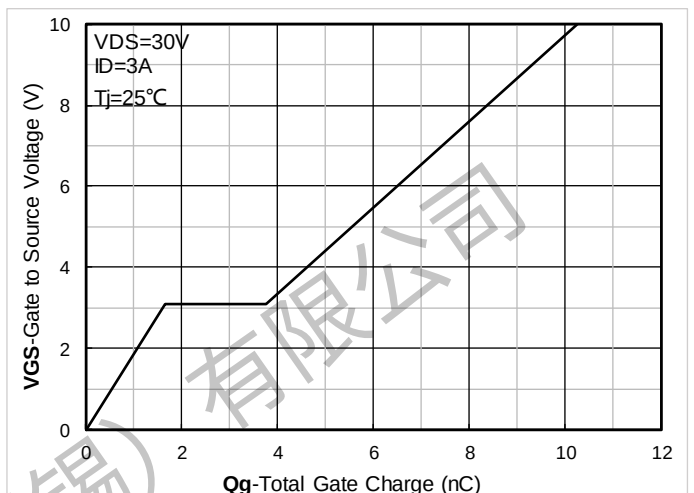


Figure 4. Gate Charge

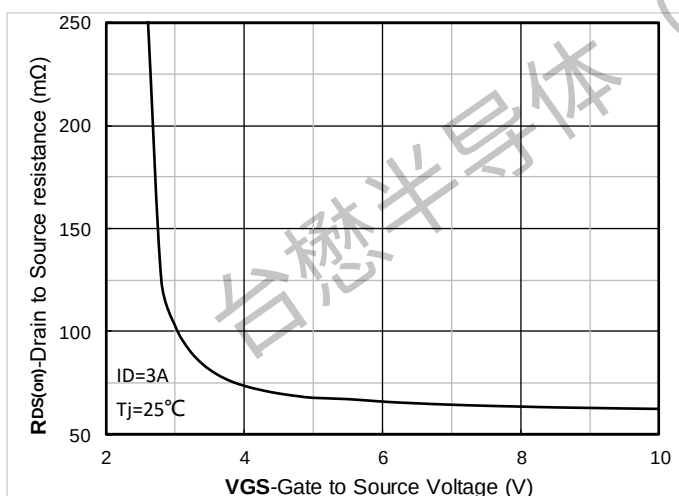


Figure 5. On-Resistance vs Gate to Source Voltage

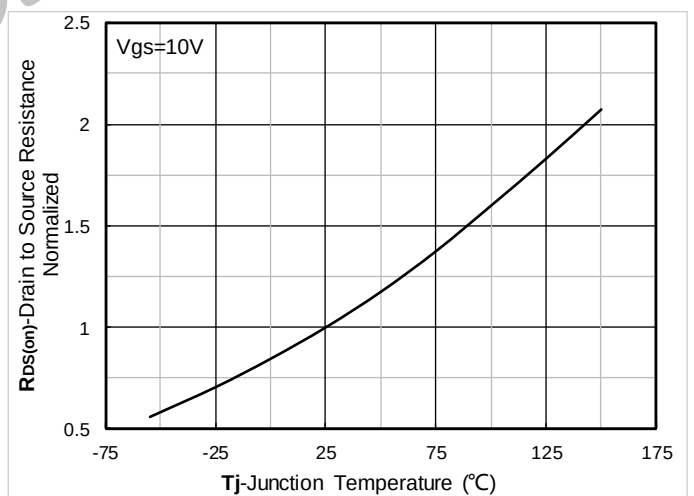


Figure 6. Normalized On-Resistance

TM10N06D

N-Channel Enhancement Mosfet

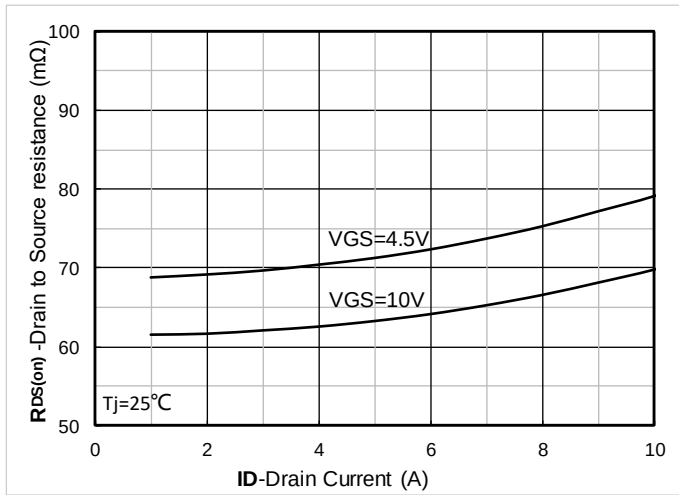


Figure 7. $R_{DS(on)}$ VS Drain Current

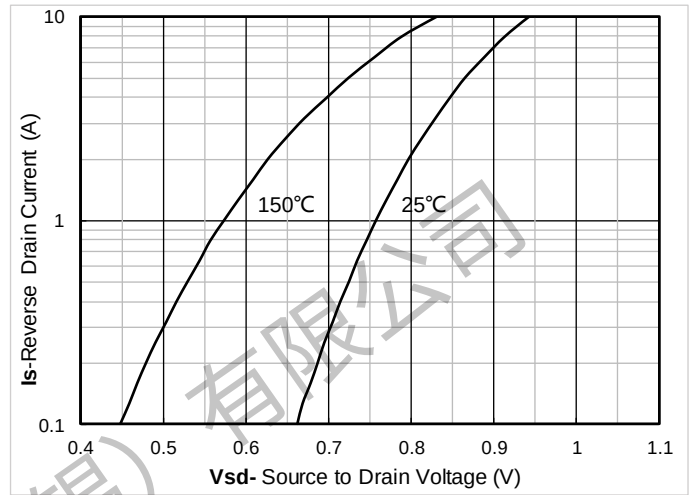


Figure 8. Forward characteristics of reverse diode

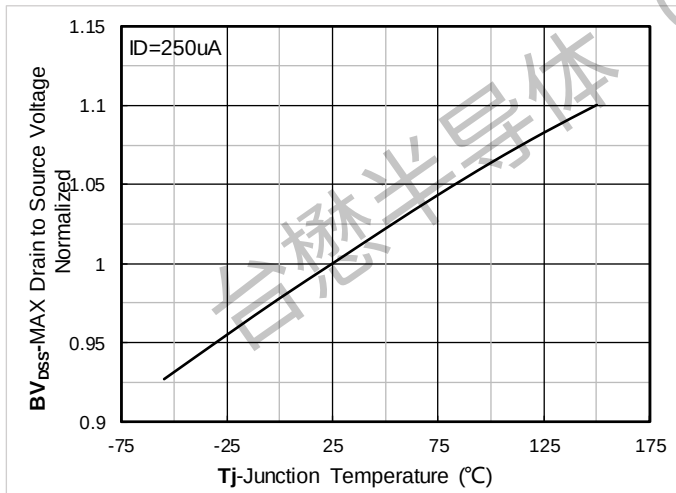


Figure 9. Normalized breakdown voltage

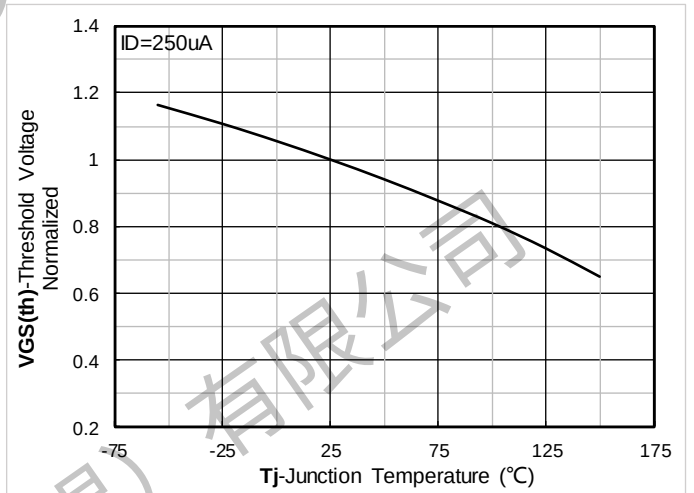


Figure 10. Normalized Threshold voltage

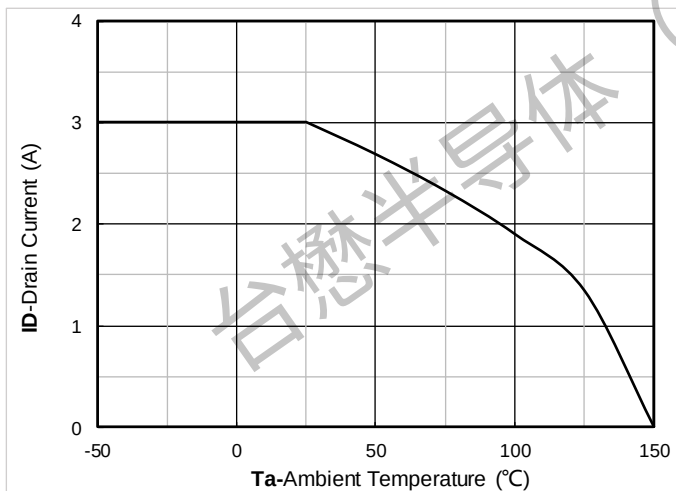


Figure 11. Current dissipation

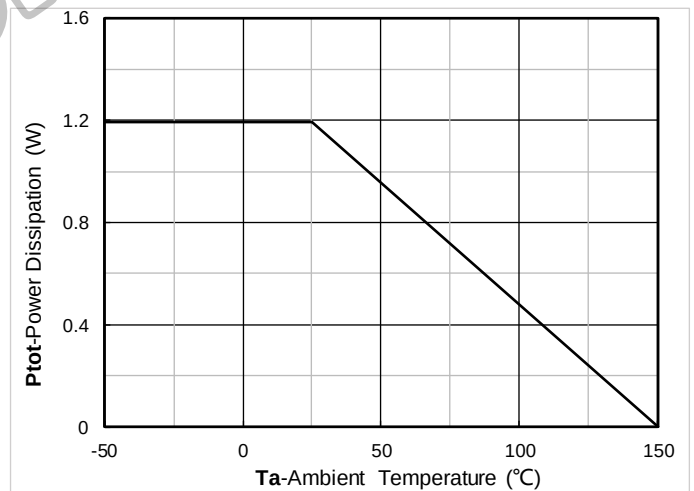


Figure 12. Power dissipation



TM10N06D

N-Channel Enhancement Mosfet

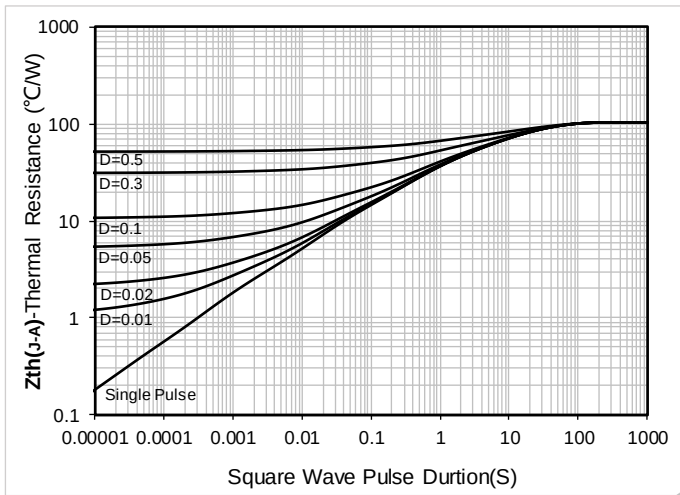


Figure 13. Maximum Transient Thermal Impedance

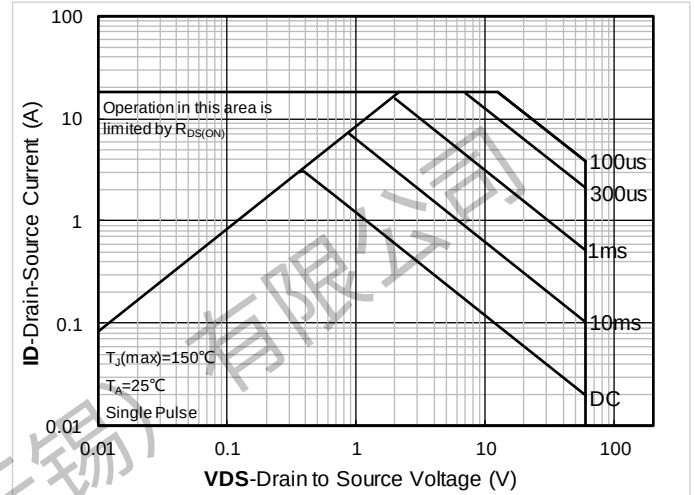


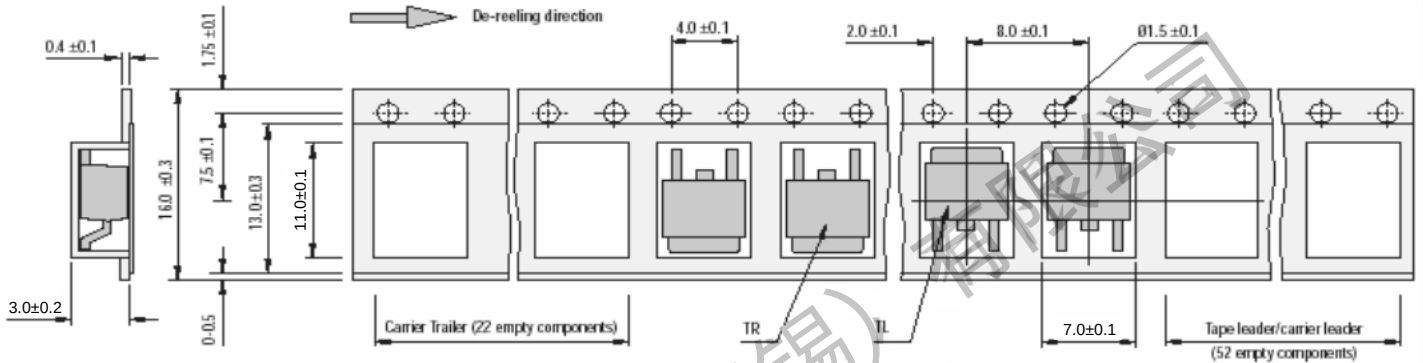
Figure 14. Safe Operation Area



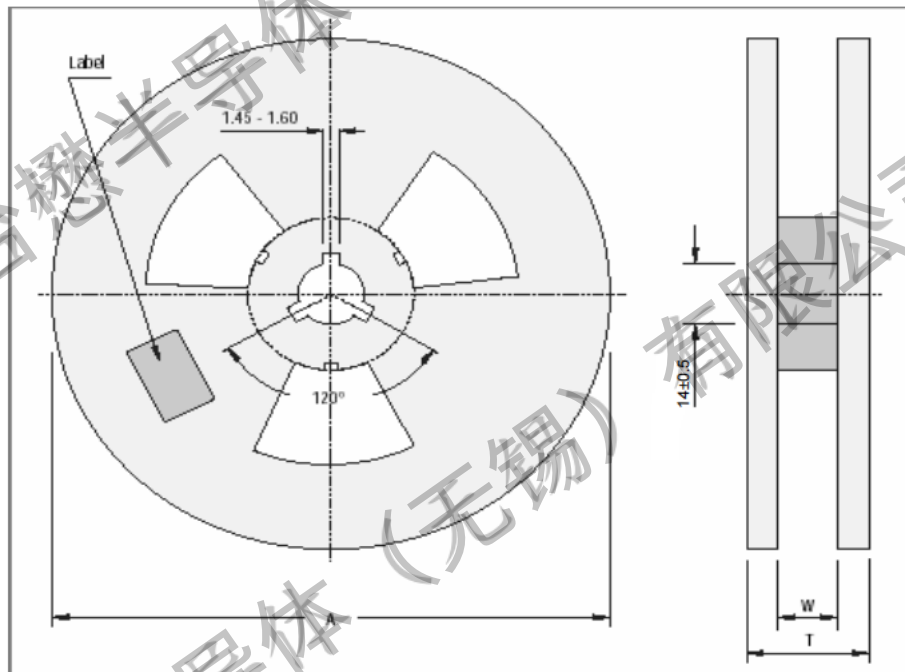
TM10N06D

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TO-252-3L Embossed Carrier Tape



TO-252-3L Reel



All Dimensions are in mm

Reel Specifications				
Package	Tape Width	Reel Dia. A - Max	Inside Thickness W	Reel Thickness T - max
TO-252-3L	16	330	18.0 ± 1.5	20

Packaging Information

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
2,500 pcs	13 inch	5,000 pcs	355×370×50	25,000 pcs	380×275×380	

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Revision history:

Date	Rev	Description	Page
2023.05.09	23.05	Original	