



TM20N10D

N-Channel Enhancement Mosfet

General Description

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

Applications

- Load switch
- PWM

General Features

$V_{DS} = 100V$ $I_D = 20A$

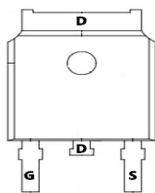
$R_{DS(ON)} = 65m\Omega$ (typ.) @ $V_{GS} = 10V$

100% UIS Tested

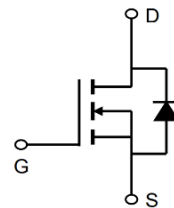
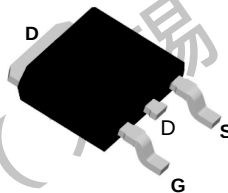
100% R_g Tested



D:TO-252-3L



Marking:20N10



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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	20	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V^1$	14	A
I_{DM}	Pulsed Drain Current ²	122	A
EAS	Single Pulse Avalanche Energy ³	4.1	mJ
I_{AS}	Avalanche Current	10	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation ³	41.7	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	$^\circ C/W$



TM20N10D

N-Channel Enhancement Mosfet

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics							
Drain-Source Breakdown Voltage		V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	100	-	-	V
Gate-body Leakage current		I _{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	I _{DSS}	V _{DS} =100V, V _{GS} = 0V	-	-	1	μA
	T _J =100°C			-	-	100	
Gate-Threshold Voltage		V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.2	1.8	2.5	V
Drain-Source on-Resistance ⁴		R _{DS(on)}	V _{GS} = 10V, I _D = 5A	-	65	80	mΩ
			V _{GS} = 4.5V, I _D = 3A	-	81	90	
Forward Transconductance ⁴		g _{fs}	V _{DS} =5V , I _D =5A	-	12	-	S
Dynamic Characteristics ⁵							
Input Capacitance		C _{iss}	V _{DS} = 15V, V _{GS} =0V, f =1MHz	-	980	-	pF
Output Capacitance		C _{oss}		-	53	-	
Reverse Transfer Capacitance		C _{rss}		-	42	-	
Gate Resistance		R _g	f =1MHz	-	1.3	-	Ω
Switching Characteristics ⁵							
Total Gate Charge		Q _g	V _{GS} = 10V, V _{DS} = 50V, I _D =5A	-	20.6	-	nC
Gate-Source Charge		Q _{gs}		-	4	-	
Gate-Drain Charge		Q _{gd}		-	3.7	-	
Turn-On Delay Time		t _{d(on)}	V _{GS} =10V, V _{DD} =50V, R _G = 3Ω, I _D = 5A	-	4.7	-	ns
Rise Time		t _r		-	21	-	
Turn-Off Delay Time		t _{d(off)}		-	20	-	
Fall Time		t _f		-	16	-	
Drain-Source Body Diode Characteristics							
Diode Forward Voltage ⁴		V _{SD}	I _S = 1A, V _{GS} = 0V	-	-	1.2	V
Continuous Source Current	T _C =25°C	I _S	-	-	-	20	A

Notes:

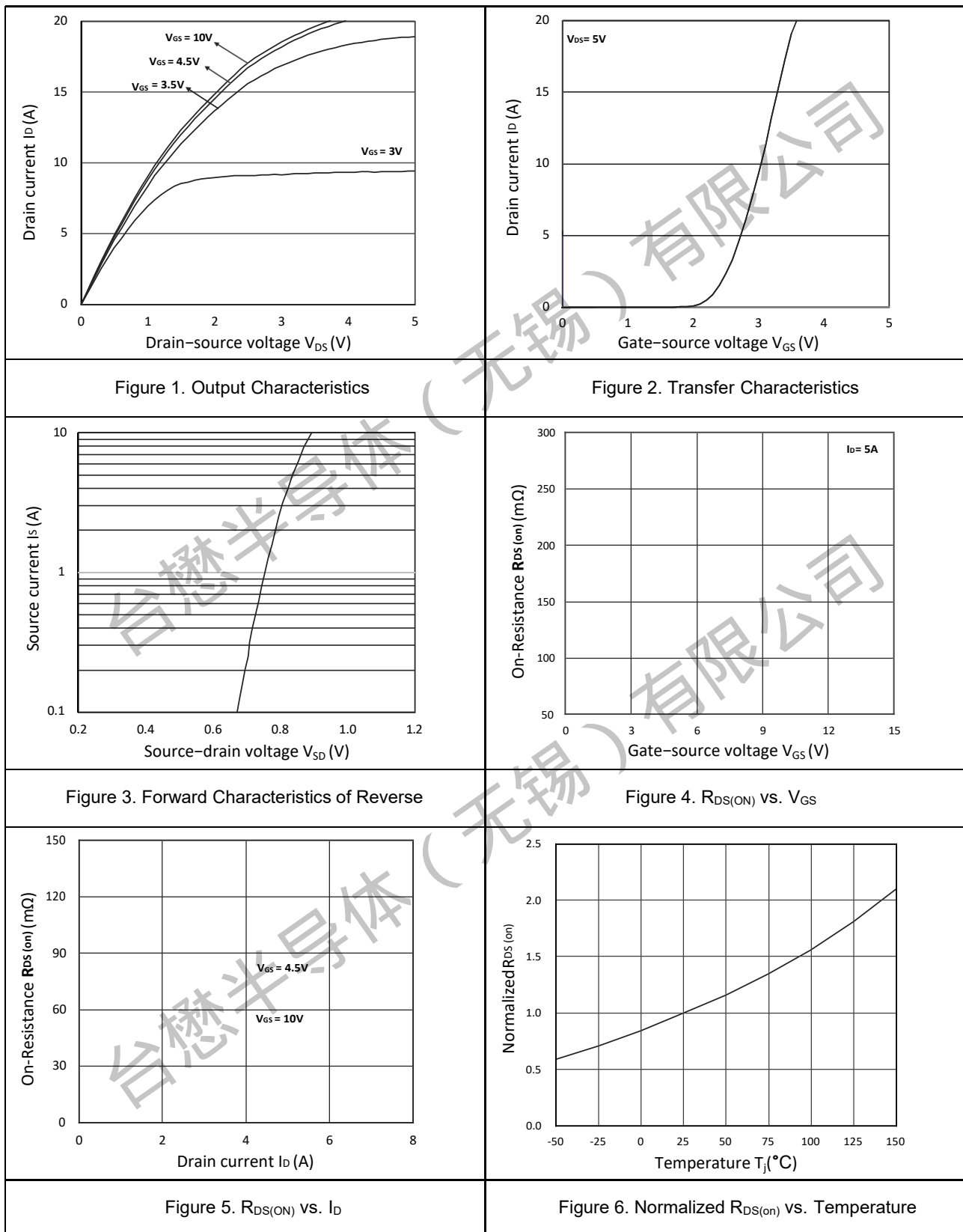
1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.
2. The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%
3. The EAS data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=8A
4. The power dissipation is limited by 150°C junction temperature
5. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.



TM20N10D

N-Channel Enhancement Mosfet

Typical Characteristics





TM20N10D

N-Channel Enhancement Mosfet

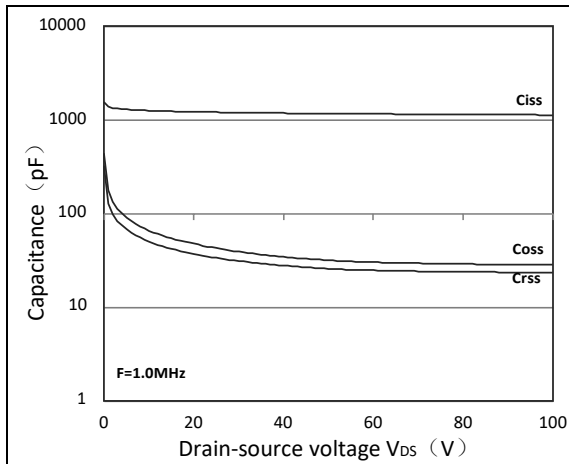


Figure 7. Capacitance Characteristics

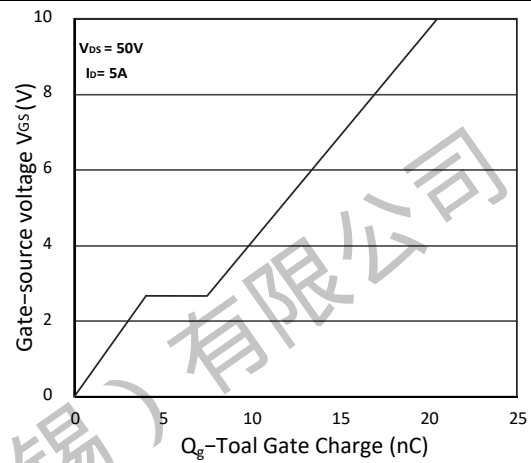


Figure 8. Gate Charge Characteristics

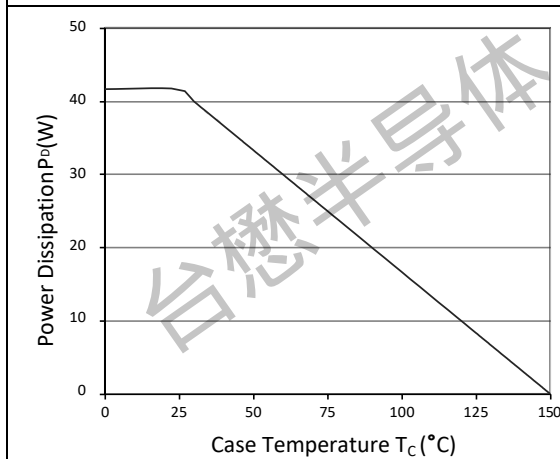


Figure 9. Power Dissipation

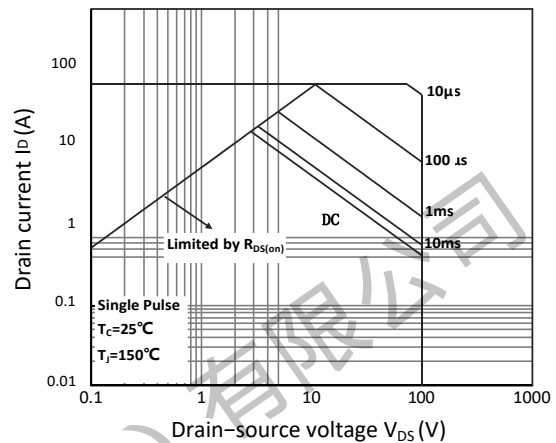


Figure 10. Safe Operating Area

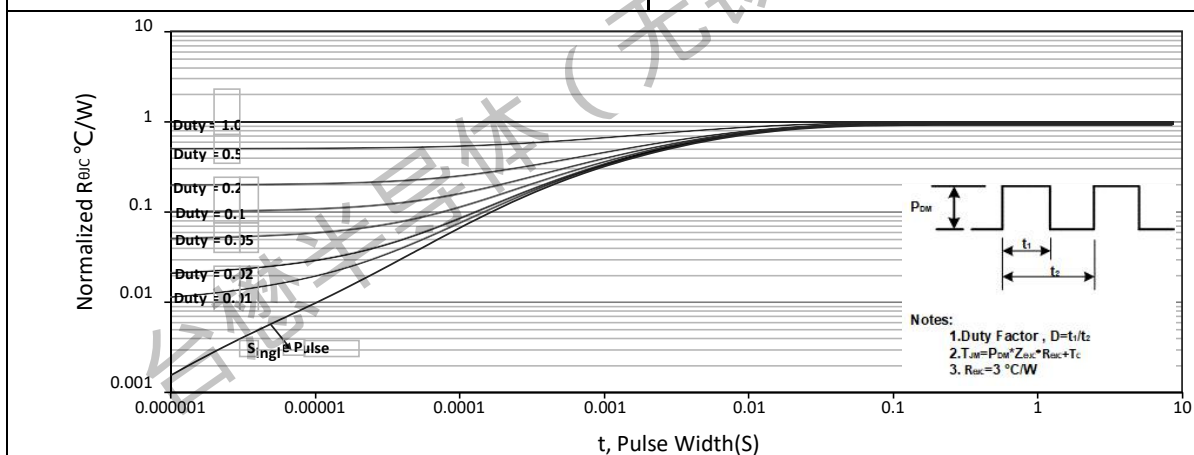
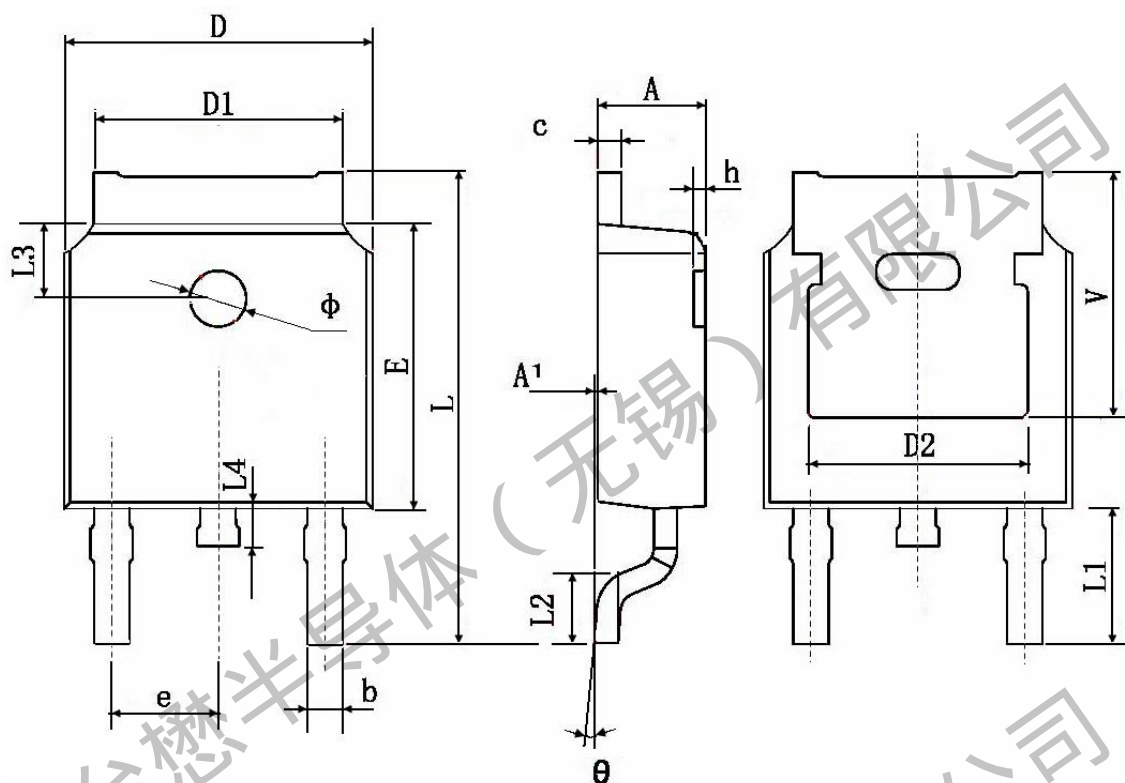


Figure 11. Normalized Maximum Transient Thermal Impedance

N-Channel Enhancement Mosfet

Package Mechanical Data: TO-252-3L



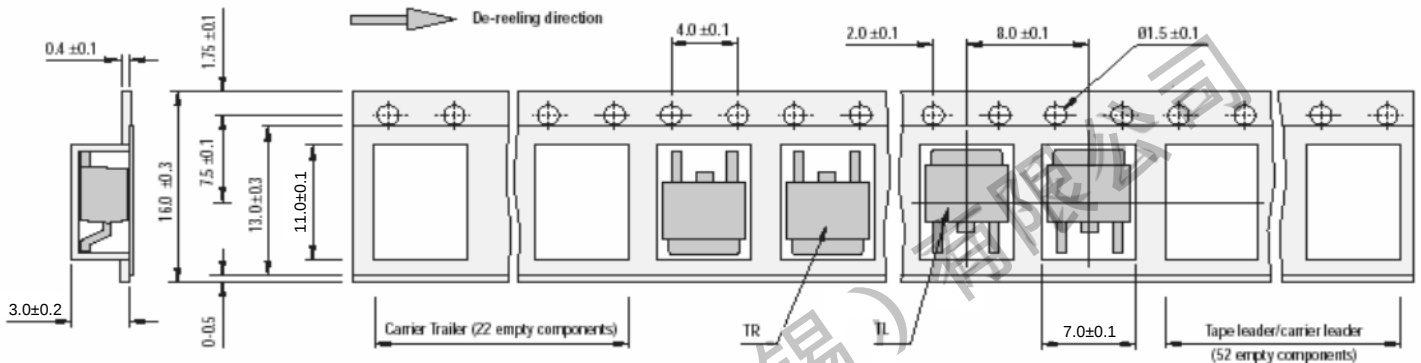
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	



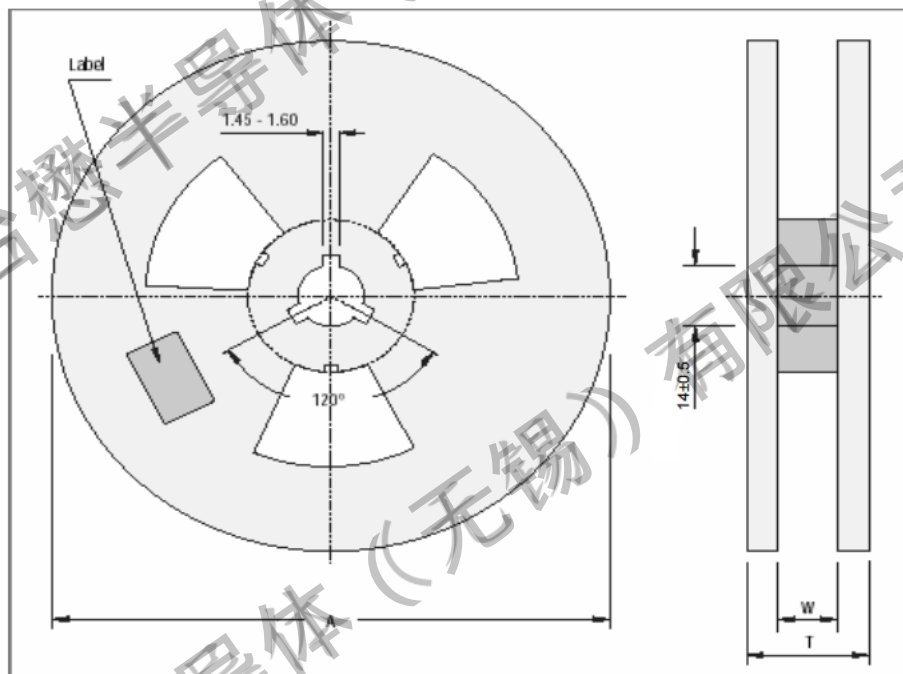
TM20N10D

N-Channel Enhancement Mosfet

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	



Important Notices and Disclaimers

- Tritech-MOS Technology Corp. reserves the right to change this document, its products, and specifications at any time without prior notice.
- Before final design, purchase, or use, customers should obtain and confirm the latest product information and specifications.
- Tritech-MOS Technology Corp. makes no warranties, representations or warranties regarding the suitability of its products for any specific purpose, and Tritech-MOS Technology Corp. does not assume any responsibility for application assistance or customer product design.
- Tritech-MOS Technology Corp. does not guarantee or assume any responsibility for the purchase or use of any unexpected or unauthorized products.
- Any intellectual property rights of Tritech-MOS Technology Corp. are not licensed through implicate or other means.
- Products of Tritech-MOS Technology Corp. are not included as critical components in life support equipment or systems without explicit written approval from Tritech-MOS Technology Corp.

Revision history:

Date	Rev	Description	Page
2023.03.06	23.03	Original	