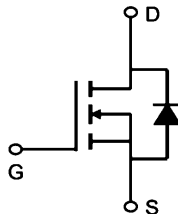
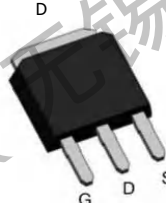
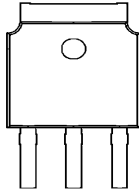




TM50N03YS

N-Channel Enhancement Mosfet

General Description • Low R_{DS(ON)} • RoHS and Halogen-Free Compliant Applications • Load switch • PWM	General Features V _{DS} = 30V I _D =50A R _{DS(ON)} =7.6mΩ (typ.) @ V _{GS} =10V 100% UIS Tested 100% R _g Tested			
YS:TO-251S-3L  Marking: 50N03				
Absolute Maximum Ratings (T_c=25℃ unless otherwise noted)				
Symbol	Parameter	Rating	Units	
V _{DS}	Drain-Source Voltage	30	V	
V _{GS}	Gate-Source Voltage	±20	V	
I _D @T _C =25℃	Continuous Drain Current, V _{GS} @ 10V	50	A	
I _D @T _C =100℃	Continuous Drain Current, V _{GS} @ 10V	26	A	
I _{DM}	Pulsed Drain Current	168	A	
EAS	Single Pulse Avalanche Energy	3	mJ	
I _{AS}	Avalanche Current	23.8	A	
P _D @T _C =25℃	Total Power Dissipation	30.5	W	
T _{STG}	Storage Temperature Range	-55 to 150	℃	
T _J	Operating Junction Temperature Range	-55 to 150	℃	
Thermal Data				
Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient	---	62	℃/W
R _{θJC}	Thermal Resistance Junction Case	---	6.6	℃/W





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N-Channel Enhancement Mosfet

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V,	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±20V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.9	1.2	1.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note3	V _{GS} =10V, I _D =20A	-	7.6	10	mΩ
		V _{GS} =4.5V, I _D =10A	-	10.2	17	
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz	-	1011	-	pF
C _{oss}	Output Capacitance		-	142	-	pF
C _{rss}	Reverse Transfer Capacitance		-	119	-	pF
Q _g	Total Gate Charge	V _{DS} =15V, I _D =20A, V _{GS} =10V	-	19	-	nC
Q _{gs}	Gate-Source Charge		-	6.3	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	4.5	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =30V, I _D =2A, R _{GEN} =3Ω, V _{GS} =10V	-	6	-	ns
t _r	Turn-on Rise Time		-	5	-	ns
t _{d(off)}	Turn-off Delay Time		-	25	-	ns
t _f	Turn-off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	50	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	160	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =30A	-	-	1.2	V
t _{rr}	Body Diode Reverse Recovery Time	I _F =30A, dI/dt=100A/μs	-	7	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	6.3	-	nC



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Typical Performance Characteristics

Figure1: Output Characteristics

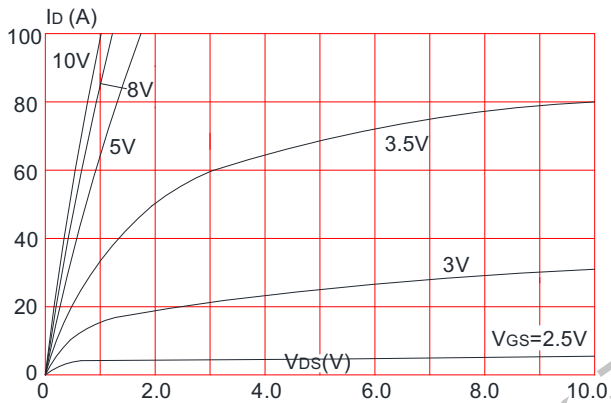


Figure 2: Typical Transfer Characteristics

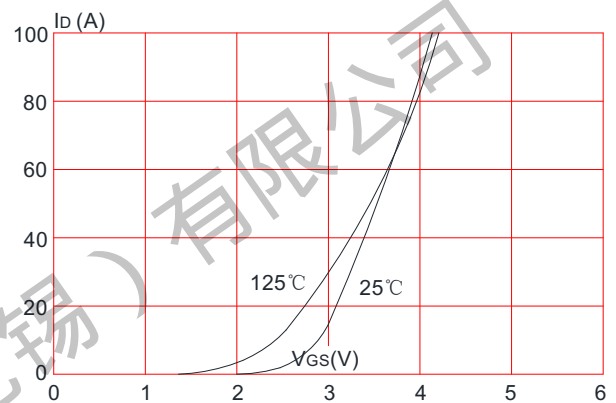


Figure 3: On-resistance vs. Drain Current

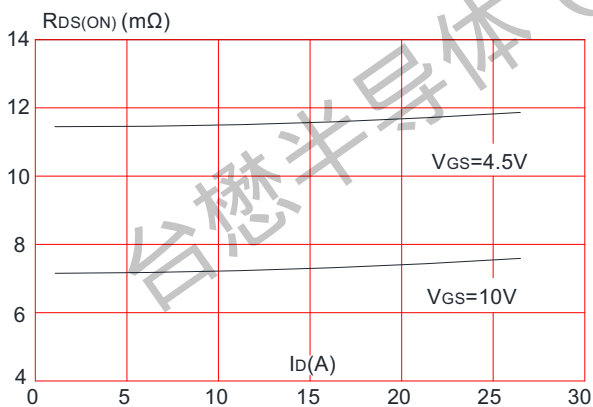


Figure 4: Body Diode Characteristics

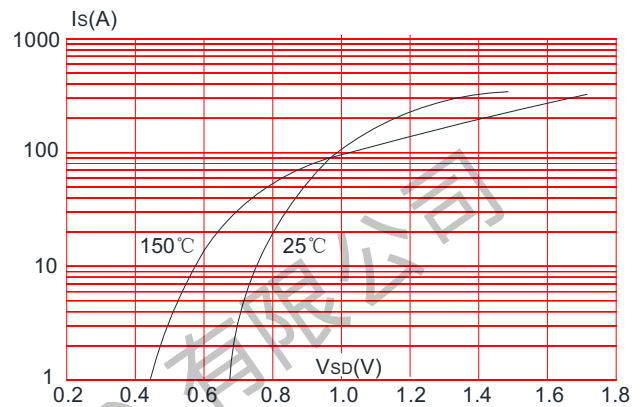


Figure 5: Gate Charge Characteristics

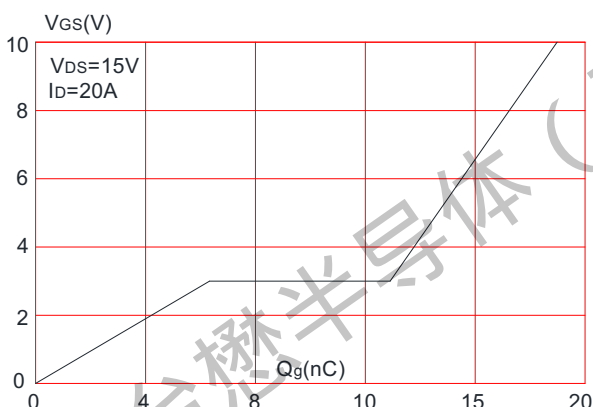
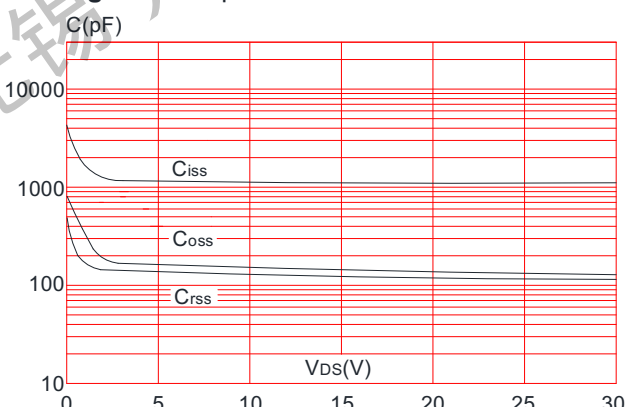


Figure 6: Capacitance Characteristics





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Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

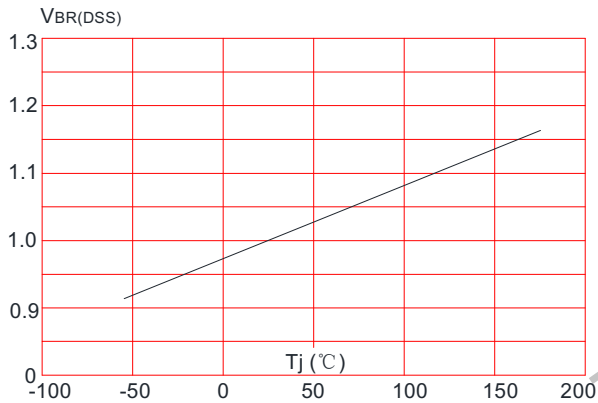


Figure 8: Normalized on Resistance vs. Junction Temperature

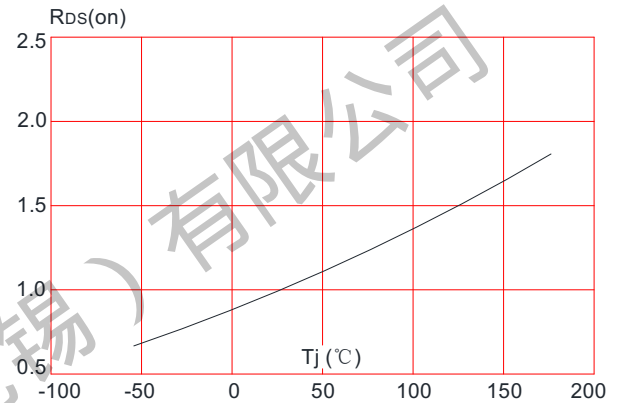


Figure 9: Maximum Safe Operating Area

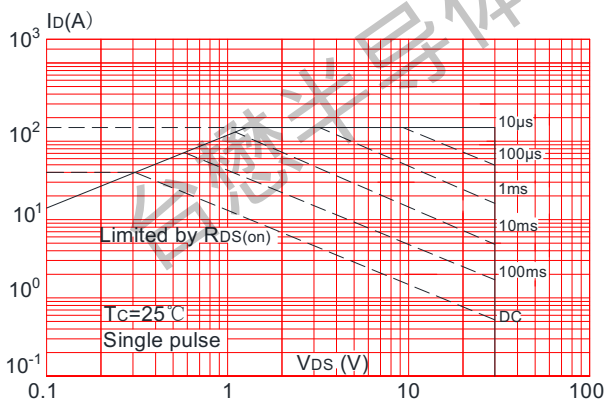
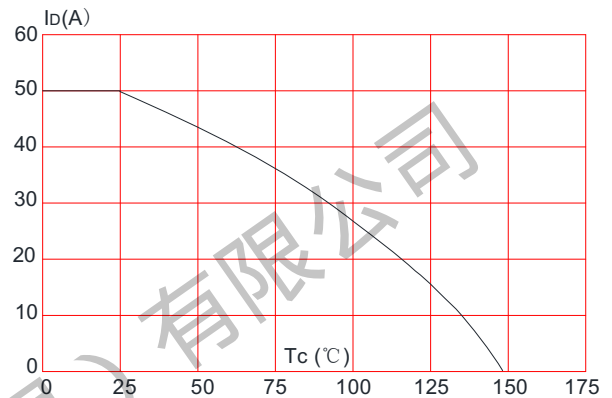
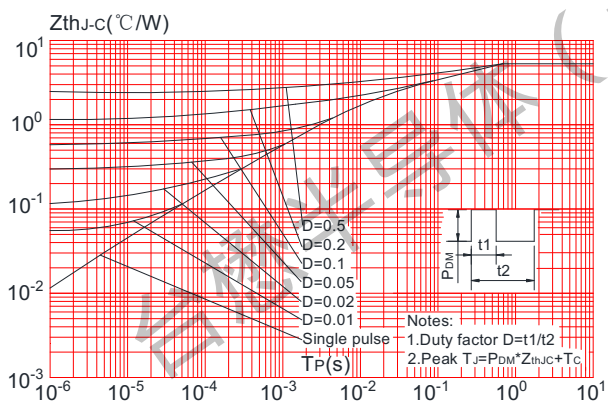


Figure 10: Maximum Continuous Drain Current vs. Case Temperature



Maximum Effective Transient Thermal Impedance, Junction-to-Case





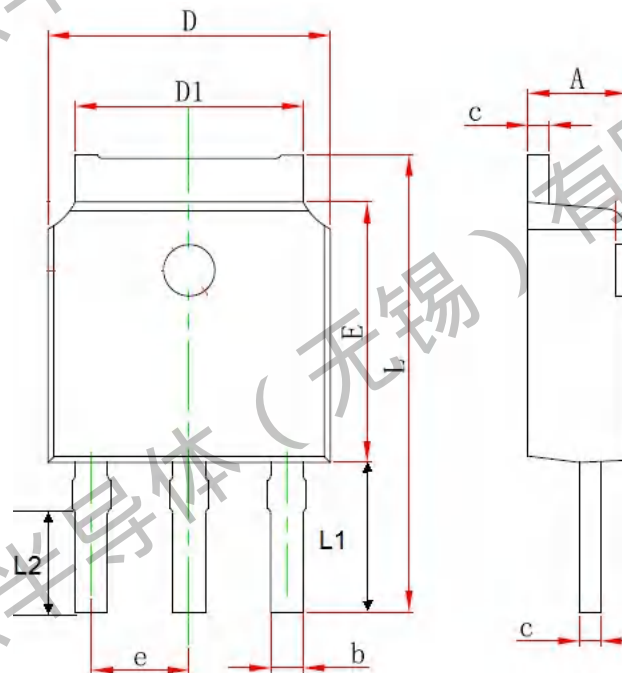
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Package Mechanical Data:TO-251S-3L

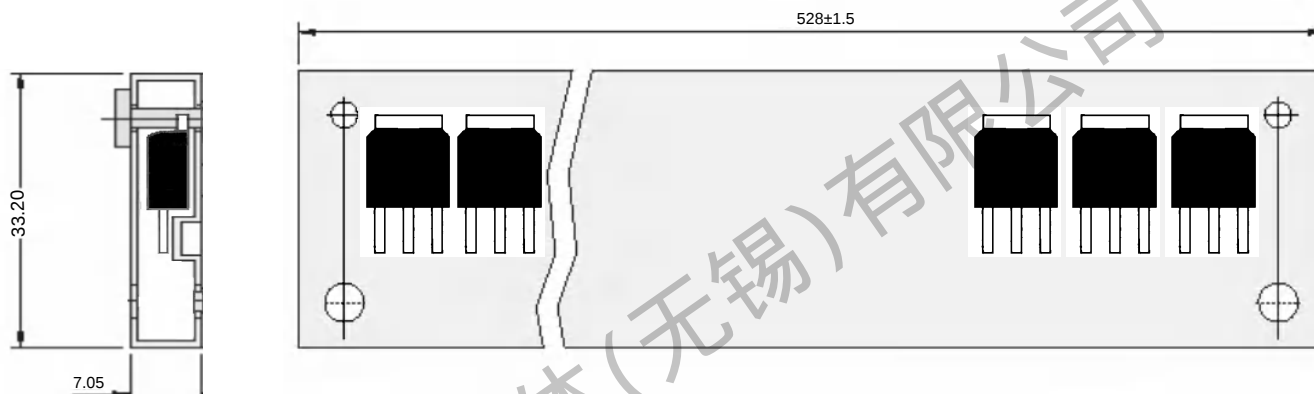
UNIT: mm

SYMBOL	min	nom	max
A	2.20		2.40
b	0.50		0.85
C	0.45	0.50	0.60
D	6.50		6.70
D1	5.10		5.50
E	5.9		6.20
e	2.18	2.29	2.38
L	11.00		12.40
L1	3.9		4.2
L2	2.7		3.0



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All Dimensions are in mm

1.TO-251S-3L Packaging

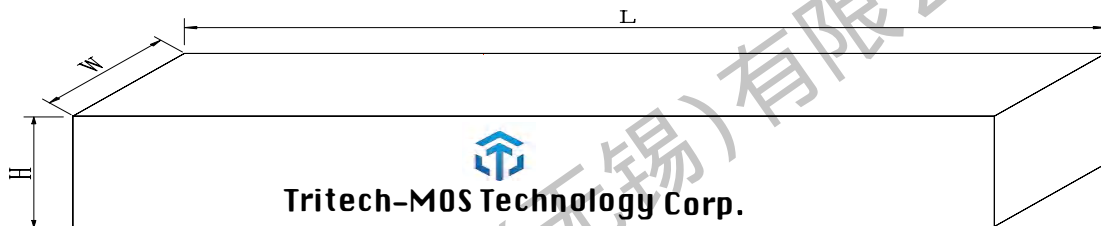
Package	Packing Form	Quantity		
		Tube	Inner Box	Outbox
TO-251S-3L	Tube Tape	80 Or 75	5 Or 6	1



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N-Channel Enhancement Mosfet

Inner Box



Dimension : 580 (L)×154(W) ×49(H) mm

Quantity : 80 × 50Ea = 4000pcs Or 75 × 56Ea = 4200pcs

Outer Box



Dimension : 595(L)×285(W) ×185(H) mm

Quantity : 4000 × 6Ea = 24000pcs Or 4200 × 5Ea = 21000pcs



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Revision history:

Date	Rev	Description	Page
2023.07.08	23.07	Original	