
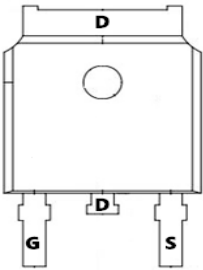




TM0052N04AD

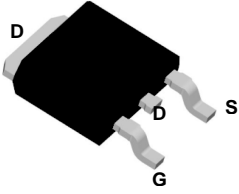
N-Channel Enhancement Mosfet

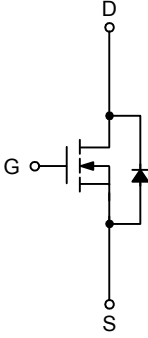
<p>General Description</p> <ul style="list-style-type: none"> • Low $R_{DS(ON)}$ • RoHS and Halogen-Free Compliant <p>Applications</p> <ul style="list-style-type: none"> • Load switch • PWM 	<p>General Features</p> <p>$V_{DS} = 40V$ $I_D = 100A$</p> <p>$R_{DS(ON)} = 5.2 m\Omega$ (Typ.) @ $V_{GS} = 10V$</p> <p>100% UIS Tested 100% R_g Tested</p> 
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Marking 100N04A

D:TO-252-3L





Absolute Maximum Ratings ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_C = 25^\circ C$	100	A
	Continuous Drain Current- $T_C = 100^\circ C$	39	A
I_{DM}	Pulse Drain Current Tested <small>note1</small>	240	A
E_{AS}	Single Pulsed Avalanche Energy <small>note2</small>	81	mJ
P_D	Power Dissipation $T_C = 25^\circ C$	47	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Data

Symbol	Parameter	Max	Units
R	Thermal Resistance Junction to Case ¹	3.2	$^\circ C/W$

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Electrical Characteristics: (Tc=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V	---	---	1.0	μ A
I_{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V_{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1.0	1.7	2.5	V
R_{DS(on)}	Drain-Source On Resistance ²	V _{GS} =10V, I _D =30A	---	5.2	6.6	m Ω
		V _{GS} =4.5V, I _D =20A	---	6.7	9.8	m Ω
Dynamic Characteristics						
C_{iss}	Input Capacitance	V _{DS} =20V, V _{GS} =0V, f=1MHz	---	2380	---	pF
C_{oss}	Output Capacitance					
C_{rss}	Reverse Transfer Capacitance					
Switching Characteristics						
t_{d(on)}	Turn-On Delay Time	V _{DD} =20V, V _{GS} =10V, RG=3Ω, I _D =30A	---	10	---	ns
t_r	Rise Time					
t_{d(off)}	Turn-Off Delay Time					
t_f	Fall Time					
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =20V, I _D =30A	---	35	---	nC
Q_{gs}	Gate-Source Charge					
Q_{gd}	Gate-Drain "Miller" Charge					
Drain-Source Diode Characteristics						
I_S	Continuous Source Current ^{1, 4}	V _G =V _D =0V,	---	---	100	A
I_{SM}	Pulsed Source Current ^{2, 4}	Force Current	---	---	240	A
V_{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =30A	---	---	1.2	V
T_{rr}	Reverse Recovery Time	I _F =20A, di/dt=100A/μs, T _J =25°C	---	22	---	ns
Q_{rr}	Reverse Recovery Charge		---	11	---	nC

Notes:

- 1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2.EAS condition: T_J=25°C, V_{DD}=20V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=18A
- 3.Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

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Typical Characteristics:

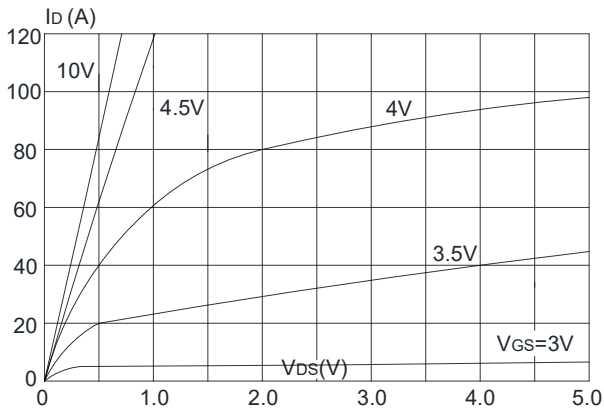


Figure 1: Output Characteristics

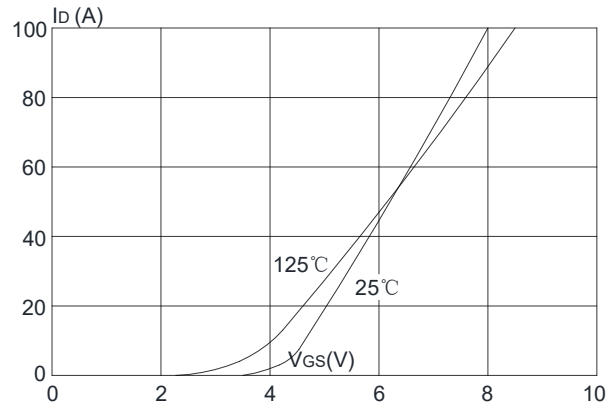


Figure 2: Typical Transfer Characteristics

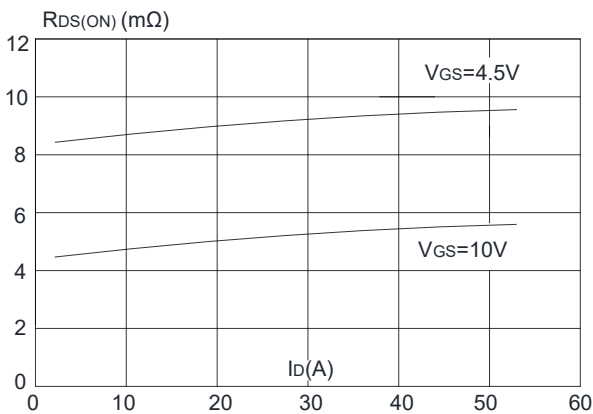


Figure 3: On-resistance vs. Drain Current

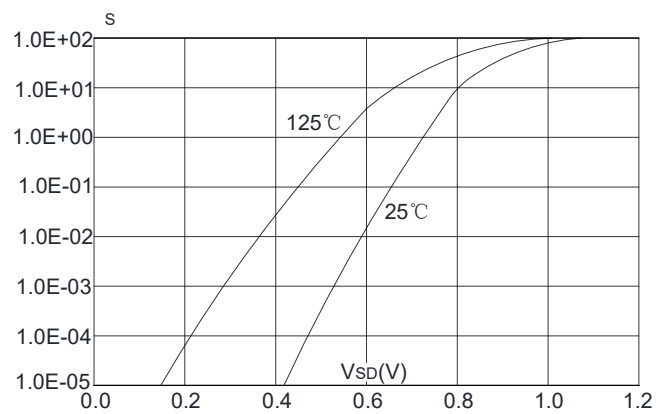


Figure 4: Body Diode Characteristics

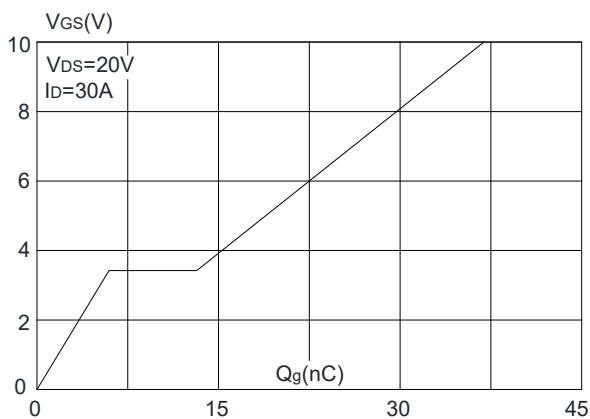


Figure 5: Gate Charge Characteristics

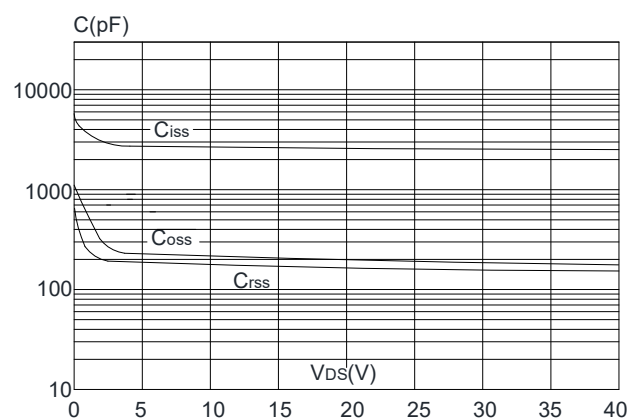


Figure 6: Capacitance Characteristics

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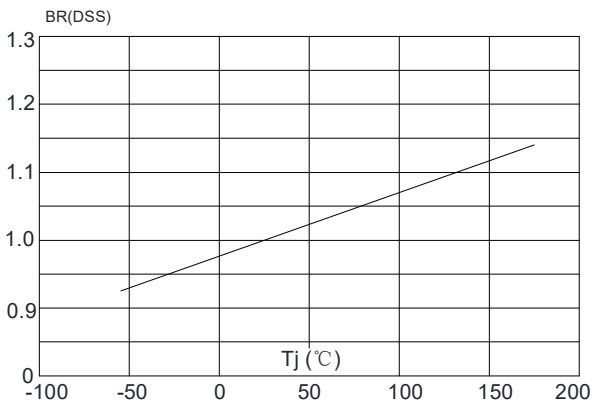


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

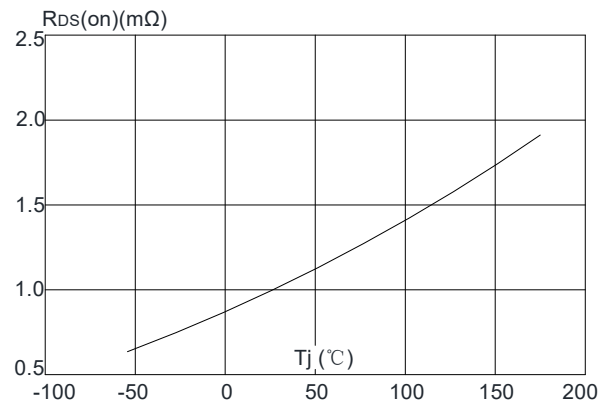


Figure 8: Normalized on Resistance vs. Junction Temperature

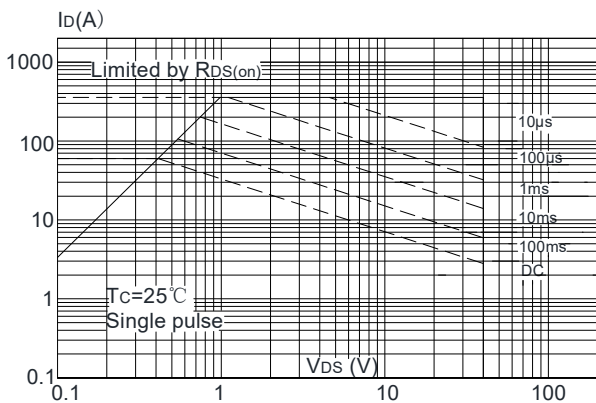


Figure 9: Maximum Safe Operating Area

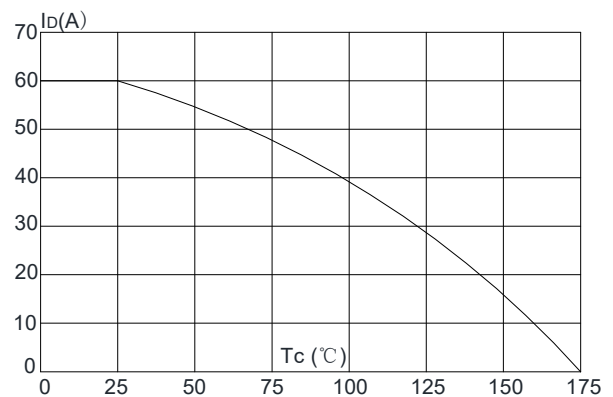


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

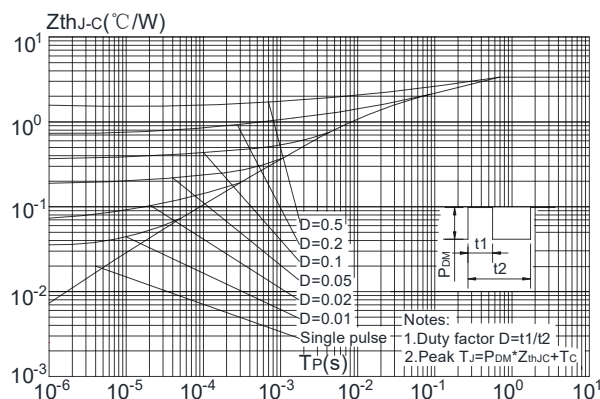
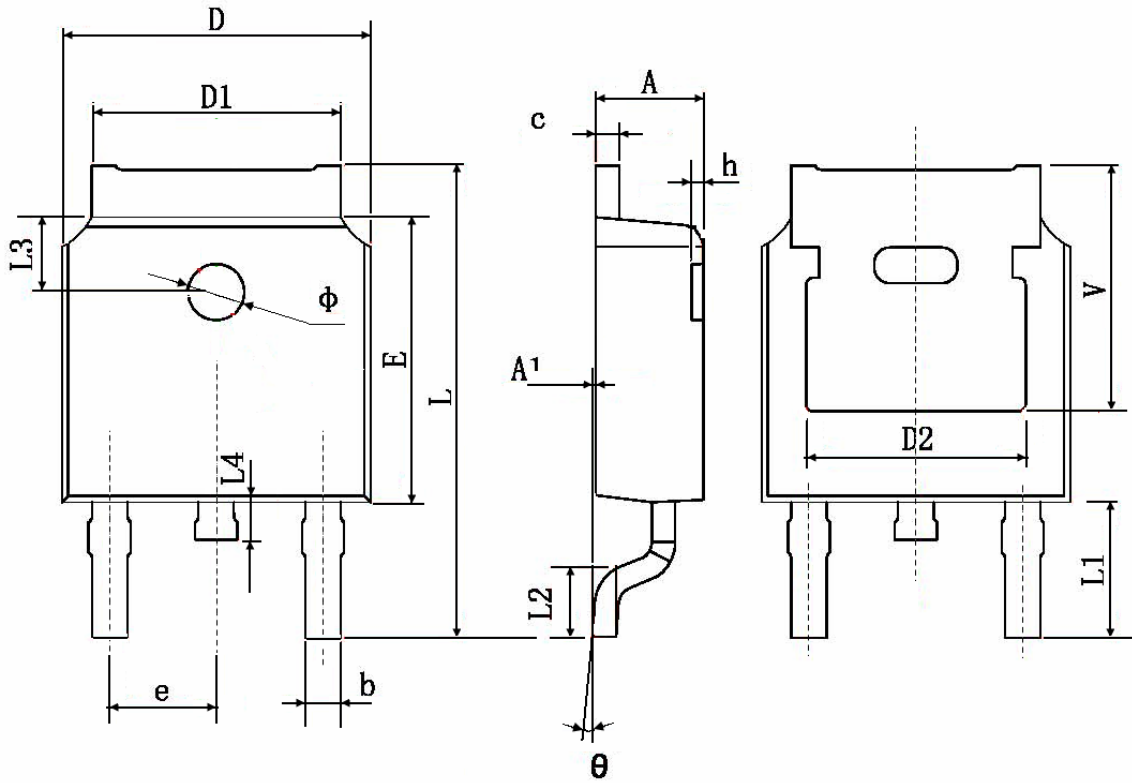


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case

Package Information: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.	

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