
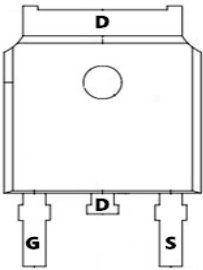


**TM100N04AD**

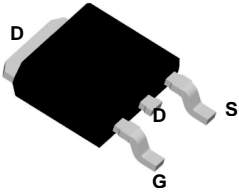
**N-Channel Enhancement Mosfet**

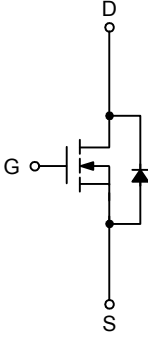
<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>• Low <math>R_{DS(ON)}</math></li> <li>• RoHS and Halogen-Free Compliant</li> </ul> <p><b>Applications</b></p> <ul style="list-style-type: none"> <li>• Load switch</li> <li>• PWM</li> </ul>	<p><b>General Features</b></p> <p><math>V_{DS} = 40V</math> <math>I_D = 100A</math></p> <p><math>R_{DS(ON)} = 5.2 m\Omega</math> (Typ.) @ <math>V_{GS} = 10V</math></p> <p>100% UIS Tested 100% <math>R_g</math> Tested</p> 
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Marking 100N04

**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	$\pm 20$	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 <sup>1</sup>	3.2	$^\circ C/W$

**TM100N04AD**

**N-Channel Enhancement Mosfet**

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
<b>BV<sub>DSS</sub></b>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250 μA	40	---	---	V
<b>I<sub>DSS</sub></b>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =40V, V <sub>GS</sub> =0V	---	---	1.0	μA
<b>I<sub>GSS</sub></b>	Gate-Source Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0A	---	---	±100	nA
<b>On Characteristics</b>						
<b>V<sub>GS(th)</sub></b>	GATE-Source Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250 μA	1.0	1.7	2.5	V
<b>R<sub>DS(on)</sub></b>	Drain-Source On Resistance <sup>2</sup>	V <sub>GS</sub> =10V, I <sub>D</sub> =30A	---	5.2	6.6	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =20A	---	6.7	9.8	mΩ
<b>Dynamic Characteristics</b>						
<b>C<sub>iss</sub></b>	Input Capacitance	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, f=1MHz	---	2380	---	pF
<b>C<sub>oss</sub></b>	Output Capacitance		---	188	---	
<b>C<sub>rss</sub></b>	Reverse Transfer Capacitance		---	160	---	
<b>Switching Characteristics</b>						
<b>t<sub>d(on)</sub></b>	Turn-On Delay Time	V <sub>DD</sub> =20V, V <sub>GS</sub> =10V, RG=3Ω, I <sub>D</sub> =30A	---	10	---	ns
<b>t<sub>r</sub></b>	Rise Time		---	10	---	ns
<b>t<sub>d(off)</sub></b>	Turn-Off Delay Time		---	35	---	ns
<b>t<sub>f</sub></b>	Fall Time		---	7	---	ns
<b>Q<sub>g</sub></b>	Total Gate Charge	V <sub>GS</sub> =10V, V <sub>DS</sub> =20V, I <sub>D</sub> =30A	---	35	---	nC
<b>Q<sub>gs</sub></b>	Gate-Source Charge		---	5	---	nC
<b>Q<sub>gd</sub></b>	Gate-Drain "Miller" Charge		---	6	---	nC
<b>Drain-Source Diode Characteristics</b>						
<b>I<sub>S</sub></b>	Continuous Source Current <sup>1, 4</sup>	V <sub>G</sub> =V <sub>D</sub> =0V,	---	---	100	A
<b>I<sub>SM</sub></b>	Pulsed Source Current <sup>2, 4</sup>	Force Current	---	---	240	A
<b>V<sub>SD</sub></b>	Diode Forward Voltage <sup>2</sup>	V <sub>GS</sub> =0V, I <sub>S</sub> =30A	---	---	1.2	V
<b>T<sub>rr</sub></b>	Reverse Recovery Time	I <sub>F</sub> =20A, dI/dt=100A/μs, T <sub>J</sub> =25°C	---	22	---	ns
<b>Q<sub>rr</sub></b>	Reverse Recovery Charge		---	11	---	nC

**Notes:**

- 1.Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
- 2.EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=20V, V<sub>G</sub>=10V, R<sub>G</sub>=25Ω, L=0.5mH, I<sub>AS</sub>=18A
- 3.Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Characteristics:

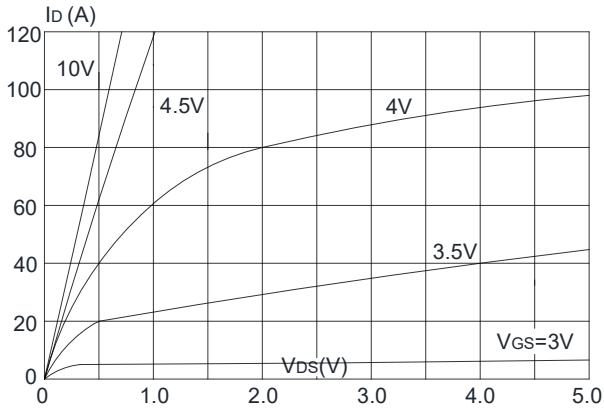


Figure 1: Output Characteristics

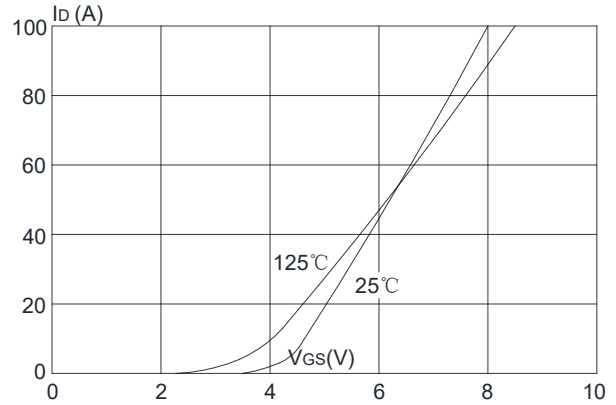


Figure 2: Typical Transfer Characteristics

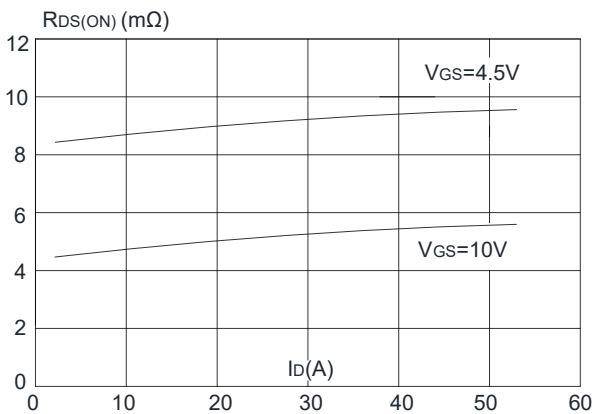


Figure 3: On-resistance vs. Drain Current

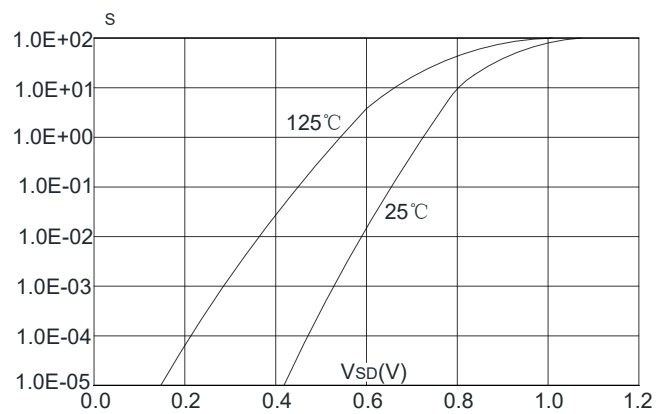


Figure 4: Body Diode Characteristics

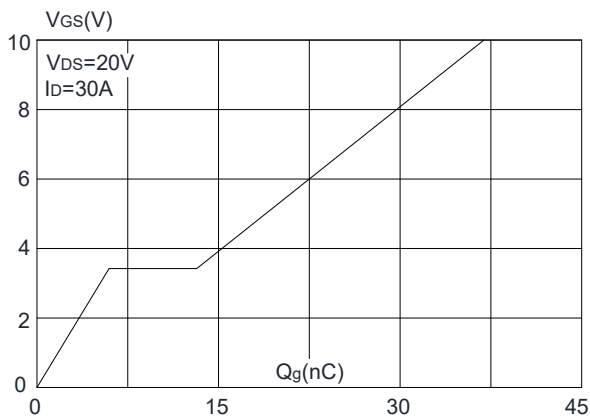


Figure 5: Gate Charge Characteristics

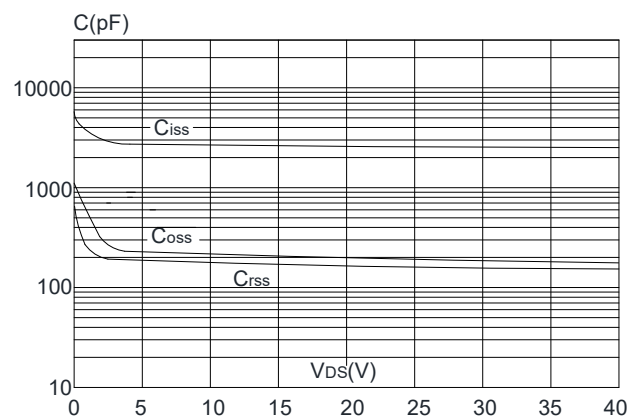
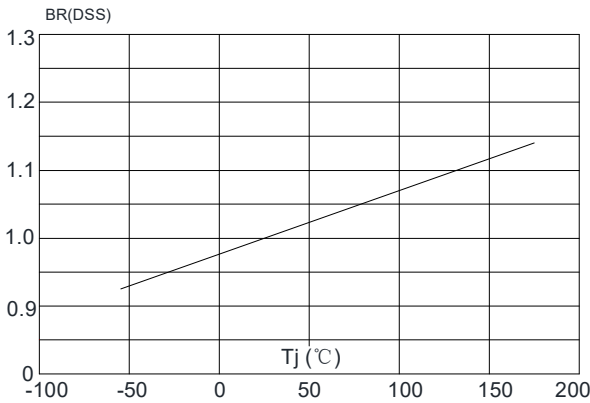


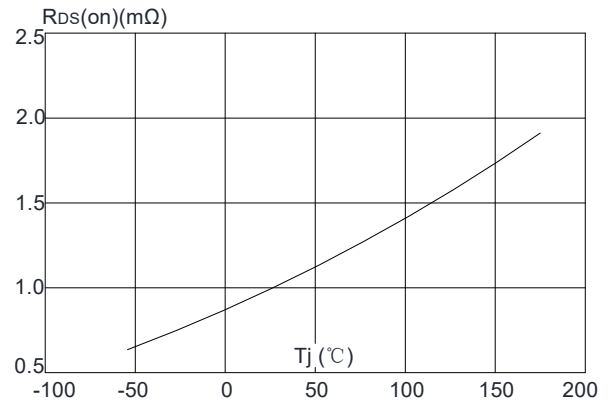
Figure 6: Capacitance Characteristics

**TM100N04AD**

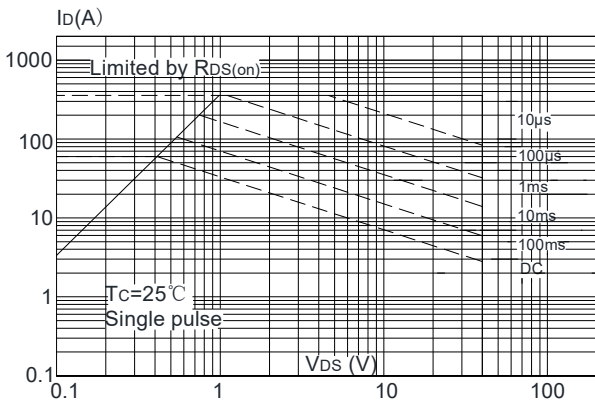
**N-Channel Enhancement Mosfet**



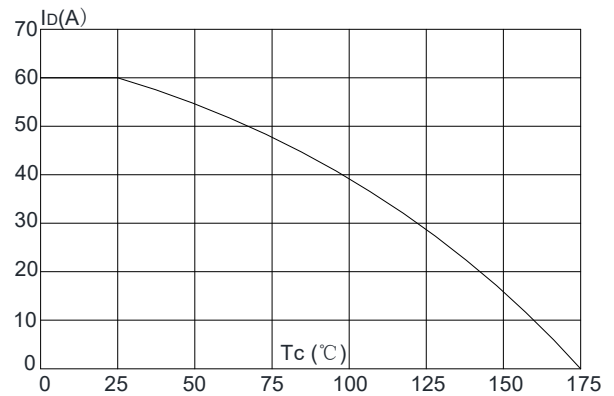
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



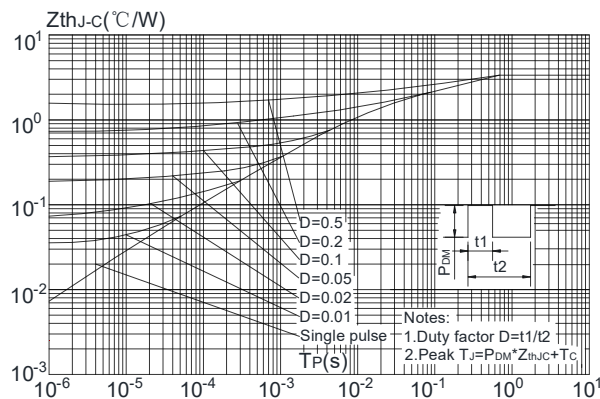
**Figure 8:** Normalized on Resistance vs. Junction Temperature



**Figure 9:** Maximum Safe Operating Area

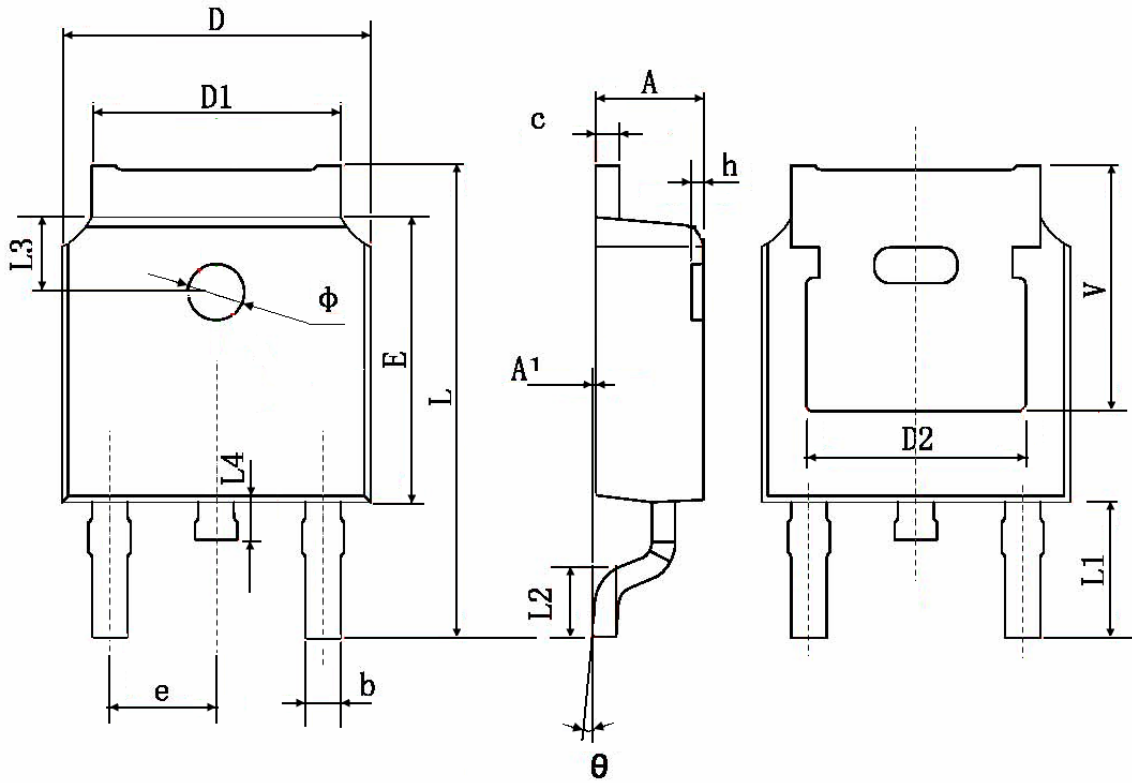


**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**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.	