
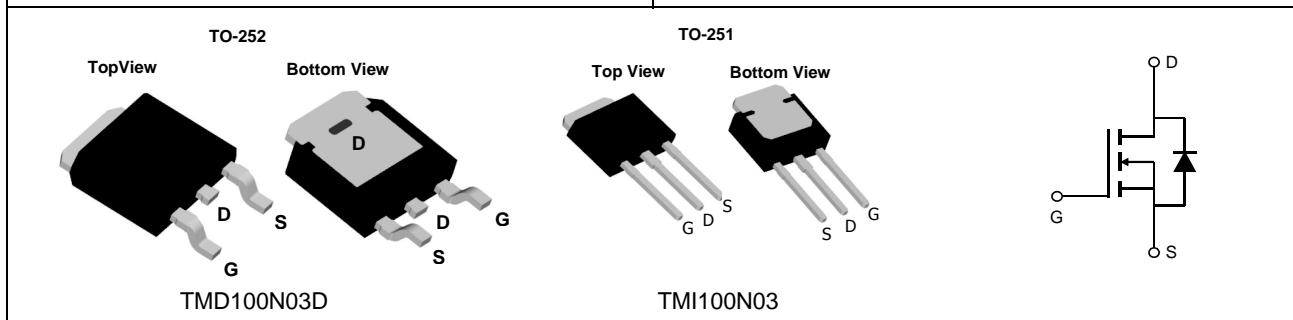


TMD100N03D / TMI100N03 N-CHANNEL POWER MOSFET

<p>General Description</p> <p>The 100N03 uses advanced trench technology to provide excellent $R_{DS(ON)}$, device is suitable for use as a Battery protection or in other Switching application.</p>	<p>Product Summary</p> <p>$V_{DS} = 30V$ $I_D = 95A$</p> <p>$R_{DS(ON)} < 6m\Omega @ V_{GS}=10V$</p> <p>$R_{DS(ON)} < 10m\Omega @ V_{GS}= 4.5V$</p> <p>100% UIS Tested 100% R_g Tested</p> <div style="text-align: right;">  </div>
---	--



Absolute Maximum Ratings $T_A=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C=25^\circ C$	Drain Current, $V_{GS} @ 10V$	95	A
$I_D @ T_C=100^\circ C$	Drain Current, $V_{GS} @ 10V$	55	A
I_{DM}	Pulsed Drain Current ¹	350	A
$P_D @ T_C=25^\circ C$	Total Power Dissipation	107	W
	Linear Derating Factor	0.7	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 175	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ C$
R_{thj-c}	Maximum Thermal Resistance, Junction-case	1.4	$^\circ C/W$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	62.5	$^\circ C/W$

Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	°C/W
--------	--	-----	------

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	-	-	V
ΔBV _{DSS} /ΔT _J	Breakdown Voltage Temperature Coefficient	Reference to 25°C, I _D =1mA	-	0.02	-	V/°C
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =45A	-	-	6	mΩ
		V _{GS} =4.5V, I _D =30A	-	-	10	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =30A	-	55	-	S
I _{DSS}	Drain-Source Leakage Current	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _J =125°C)	V _{DS} =24V, V _{GS} =0V	-	-	250	uA
I _{GSS}	Gate-Source Leakage	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
Q _g	Total Gate Charge ²	I _D =30A	-	33	52	nC
Q _{gs}	Gate-Source Charge	V _{DS} =24V	-	8		nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	24		nC
Q _{oss}	Output Charge	V _{DD} =15V, V _{GS} =0V	-	24.5	39	nC
t _{d(on)}	Turn-on Delay Time ²	V _{DS} =15V	-	11	-	ns
t _r	Rise Time	I _D =30A	-	77	-	ns
t _{d(off)}	Turn-off Delay Time	R _G =3.3Ω	-	35	-	ns
t _f	Fall Time	V _{GS} =10V	-	67	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	2700	4200	pF
C _{oss}	Output Capacitance	V _{DS} =25V f=1.0MHz	-	550	-	pF
C _{rss}	Reverse Transfer Capacitance		-	380	-	pF
V _{SD}	Forward On Voltage ²	I _S =45A, V _{GS} =0V	-	-	1.3	V
t _{rr}	Reverse Recovery Time ²	I _S =30A, V _{GS} =0V, di/dt=100A/μs	-	28	-	ns
Q _{rr}	Reverse Recovery Charge		-	10	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse width ≤300us , duty cycle ≤2%.
- 3.Surface mounted

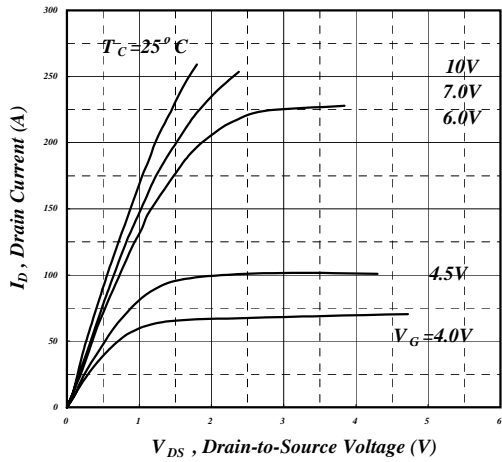


Fig 1. Typical Output Characteristics

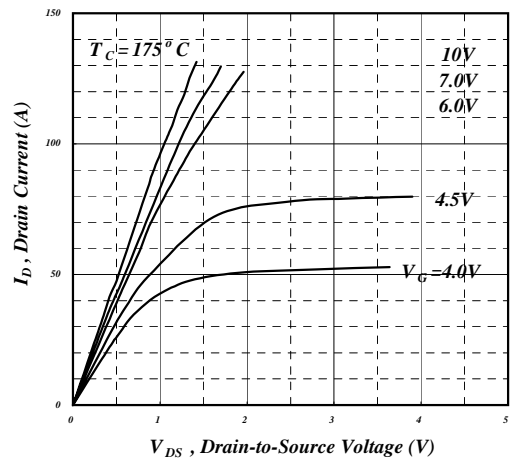


Fig 2. Typical Output Characteristics

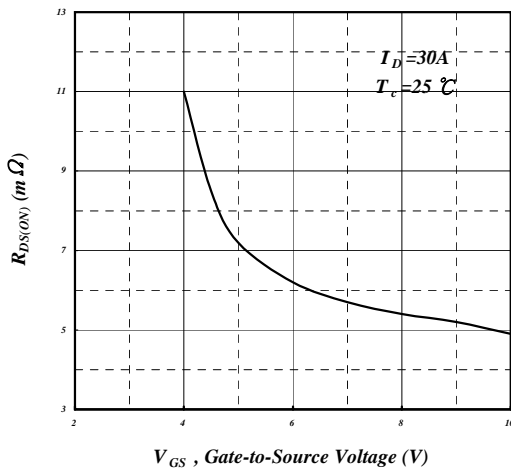


Fig 3. On-Resistance v.s. Gate Voltage

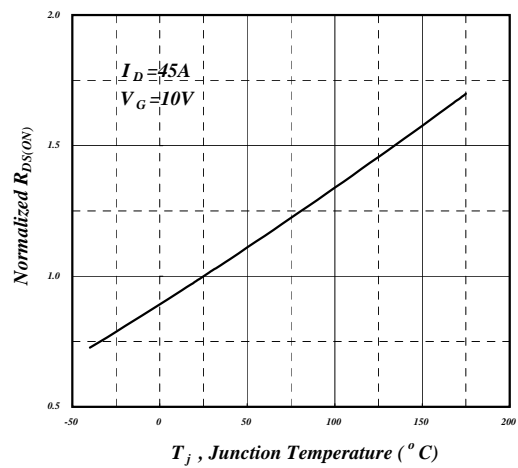


Fig 4. Normalized On-Resistance v.s. Junction Temperature

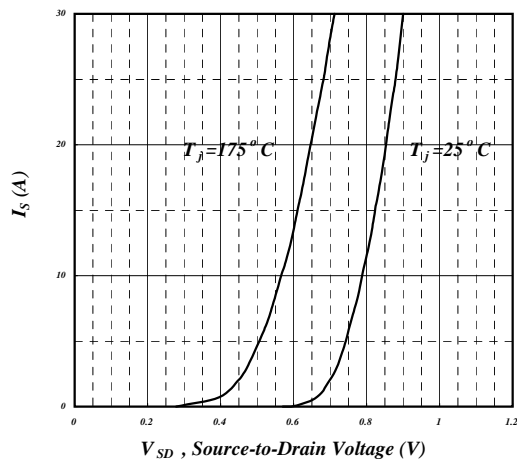


Fig 5. Forward Characteristic of Reverse Diode

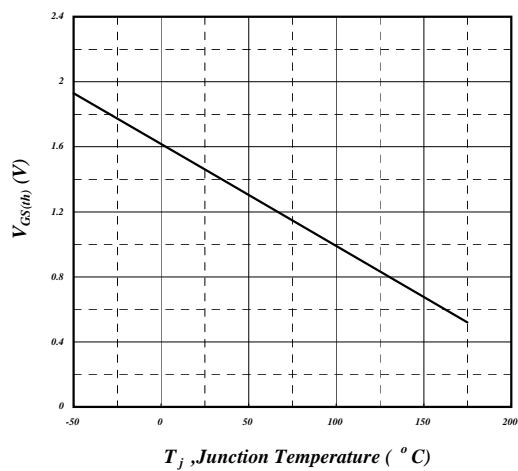


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

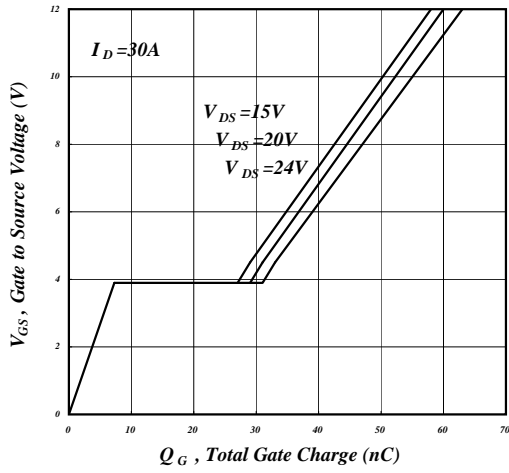


Fig 7. Gate Charge Characteristics

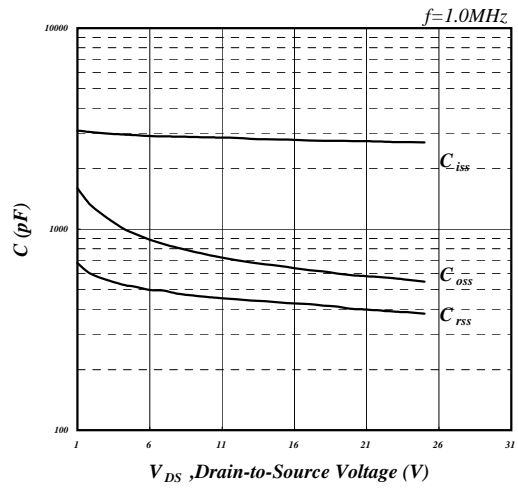


Fig 8. Typical Capacitance Characteristics

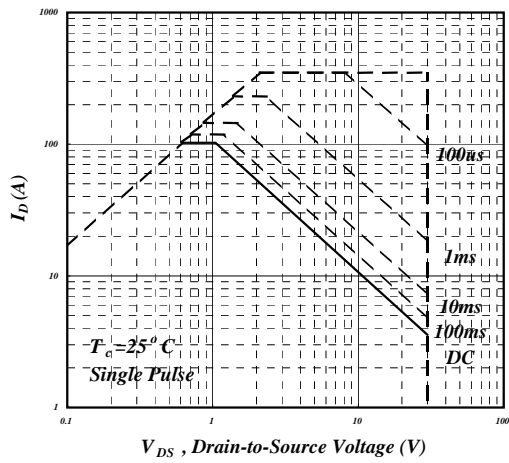


Fig 9. Maximum Safe Operating Area

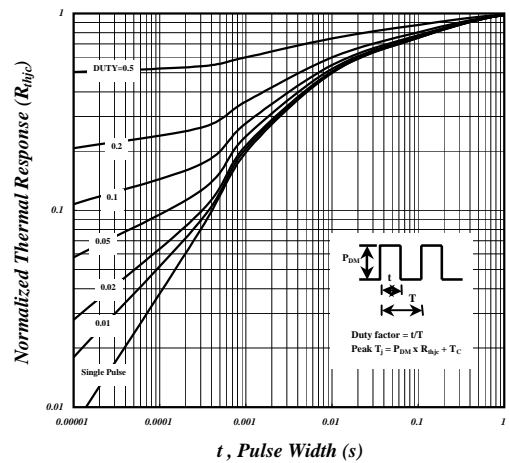


Fig 10. Effective Transient Thermal Impedance

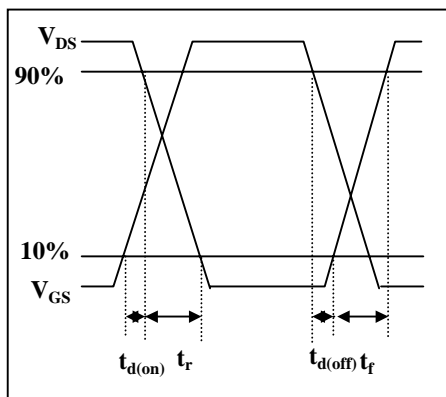


Fig 11. Switching Time Waveform

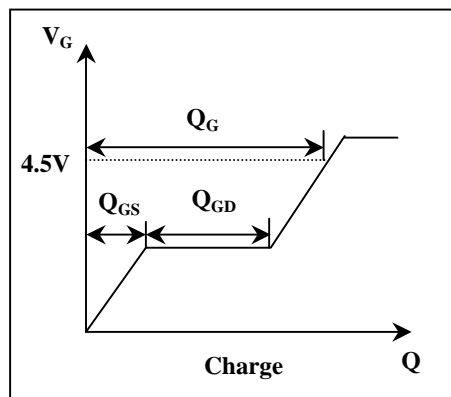


Fig 12. Gate Charge Waveform

TO-252 Package Information

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
-	1.100	1.300	0.043	0.051
	e	e	e	e
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

TO-251 Package Information

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311

Notes

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact