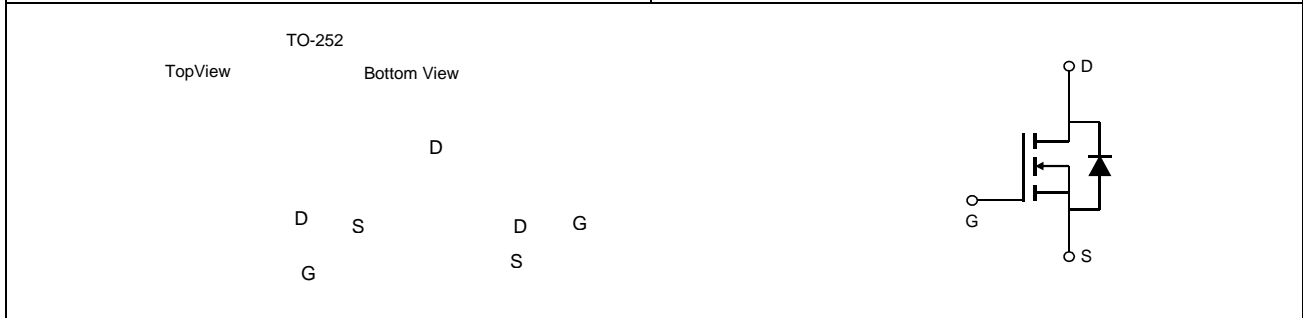


TMD50N03D N-CHANNEL POWER MOSFET

<p>General Description</p> <p>The TMD50N03D uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.</p>	<p>Product Summary</p> <p> $V_{GS} = 10V$ $V_{DS} = 30V$ $I_{D@T_A=25^\circ C} = 50A$ $I_{D@T_A=70^\circ C} = 25A$ </p>
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Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
VDS	Drain-Source Voltage	30	V
VGS	Gate-Source Voltage	±20	V
$I_{D@T_A=25^\circ C}$	Continuous Drain Current ³	50	A
$I_{D@T_A=70^\circ C}$	Continuous Drain Current ³	25	A
IDM	Pulsed Drain Current ¹	80	A
$P_D@T_A=25^\circ C$	Total Power Dissipation	25	W
	Linear Derating Factor	0.02	W/°C
TSTG	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C
Rthj-a	Maximum Thermal Resistance, Junction-ambient ³	50	°C/W

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	30	-	-	V
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =9A	-	9	13	mΩ
		V _{GS} =4.5V, I _D =7A	-	14	18	mΩ
		V _{GS} =4V, I _D =4A	-	-	40	mΩ
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	1	-	3	V
g _{fs}	Forward Transconductance	V _{DS} =10V, I _D =9A	-	9	-	S
IDSS	Drain-Source Leakage Current	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
	Drain-Source Leakage Current (T _j =70°C)	V _{DS} =24V, V _{GS} =0V	-	-	25	uA
IGSS	Gate-Source Leakage	V _{GS} =±20V	-	-	100	nA
Q _g	Total Gate Charge ²	I _D =9A	-	12	18	nC
Q _{gs}	Gate-Source Charge	V _{DS} =20V	-	2	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =4.5V	-	7	-	nC
td(on)	Turn-on Delay Time ²	V _{DS} =15V	-	7	-	ns
t _r	Rise Time	I _D =1A	-	7	-	ns
td(off)	Turn-off Delay Time	R _G =3.3Ω, V _{GS} =10V	-	22	-	ns
t _f	Fall Time	R _D =15Ω	-	7	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V V _{DS} =25V f=1.0MHz	-	710	350	pF
C _{oss}	Output Capacitance		-	155	-	pF
C _{rss}	Reverse Transfer Capacitance		-	145	-	pF
VSD	Forward On Voltage ²	I _S =2.1A, V _{GS} =0V	-	-	1.2	V
t _{rr}	Reverse Recovery Time ²	I _S =9A, V _{GS} =0V, dI/dt=100A/μs	-	24	-	ns
Q _{rr}	Reverse Recovery Charge		-	14	-	nC

Notes:

1.Pulse width limited by Max. junction temperature.

2.Pulse test

3.Surface mounted on 1 in² copper pad of FR4 board, t ≤10sec ; 125 °C/W when mounted on Min. copper pad.

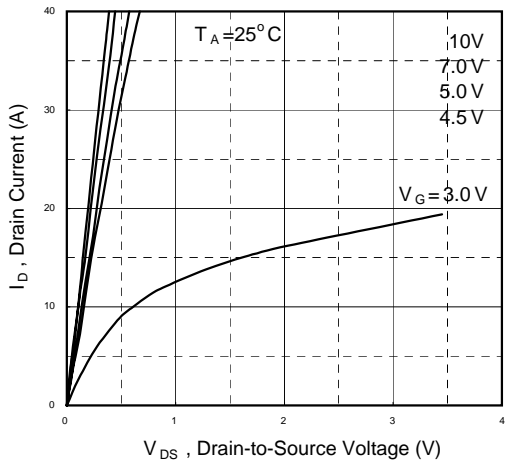


Fig 1. Typical Output Characteristics

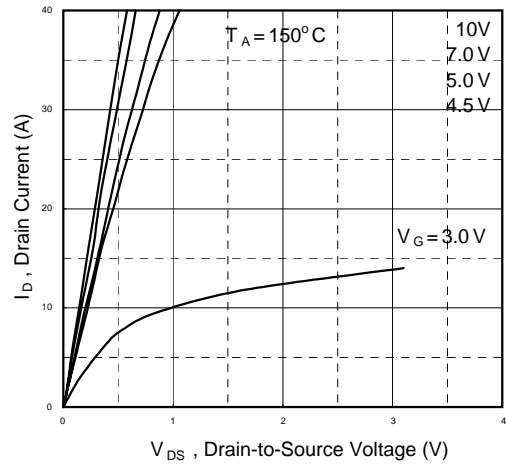


Fig 2. Typical Output Characteristics

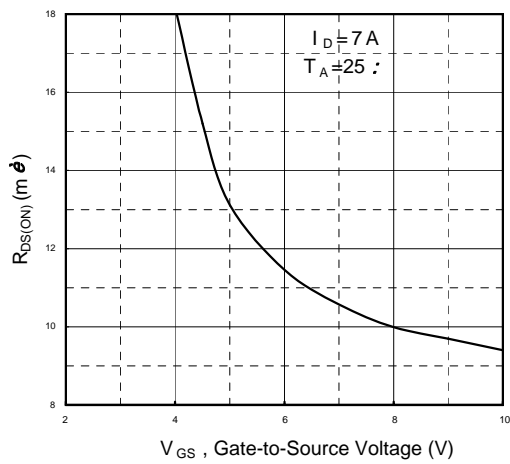


Fig 3. On-Resistance v.s. Gate Voltage

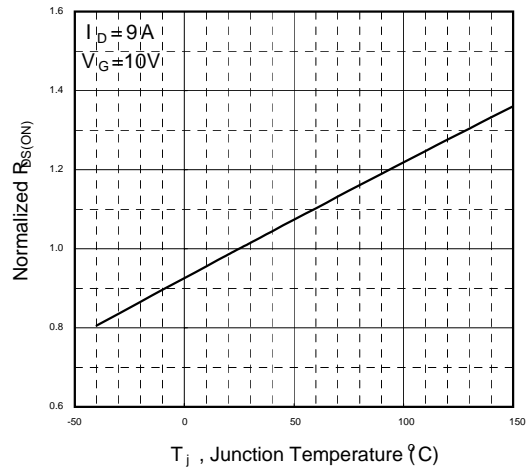


Fig 4. Normalized On-Resistance v.s. Junction Temperature

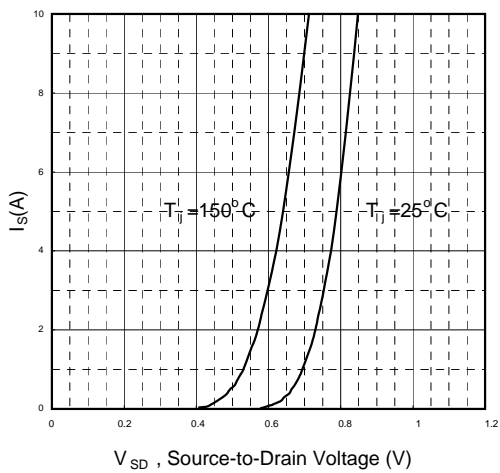


Fig 5. Forward Characteristic of Reverse Diode

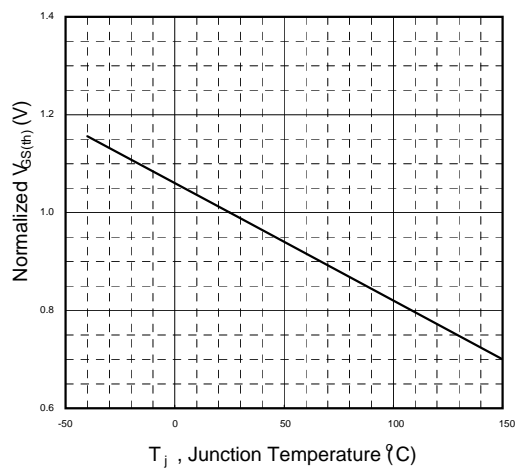


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

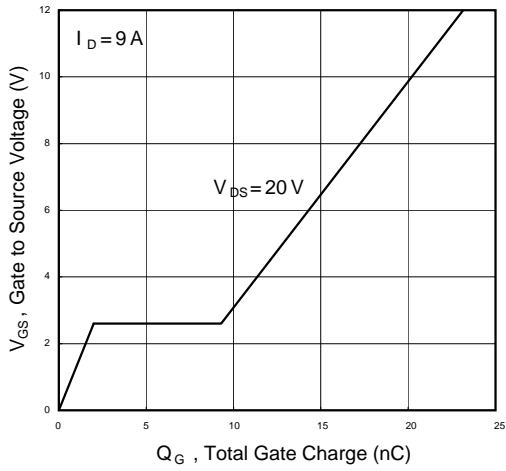


Fig 7. Gate Charge Characteristics

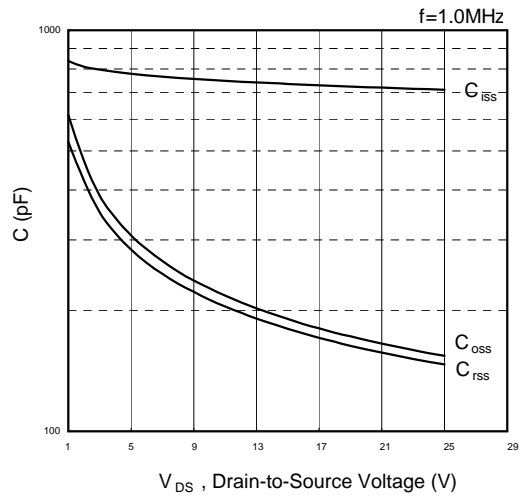


Fig 8. Typical Capacitance Characteristics

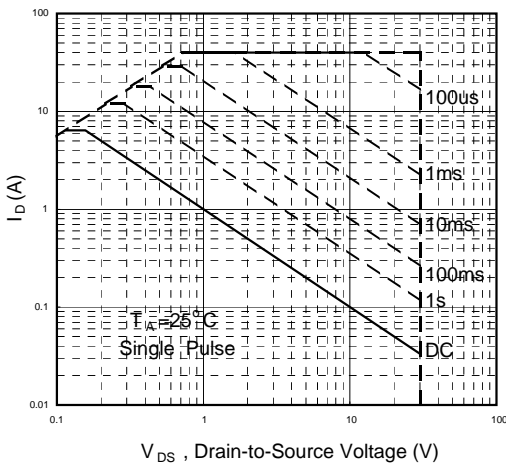


Fig 9. Maximum Safe Operating Area

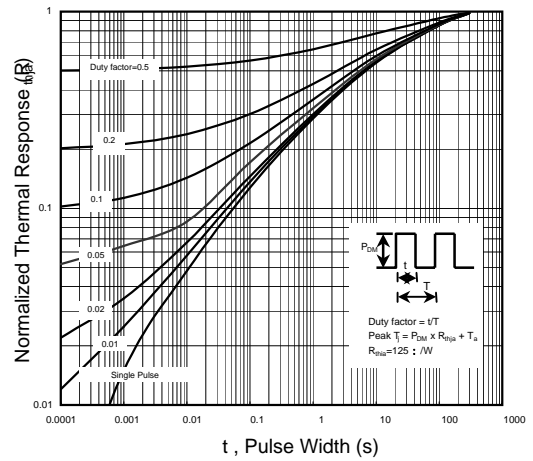


Fig 10. Effective Transient Thermal Impedance

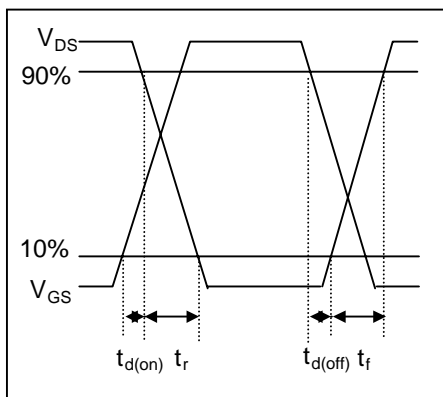


Fig 11. Switching Time Waveform

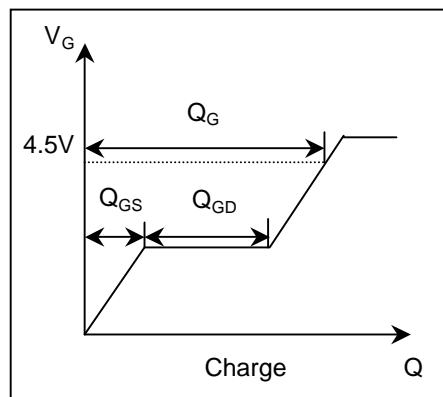


Fig 12. Gate Charge Waveform

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
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.	