



TMGN10050AD

N-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

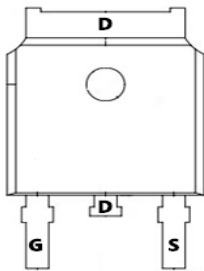
Applications

- Load switch
- PWM

General Features

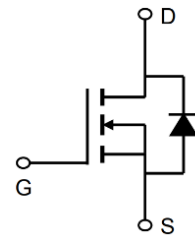
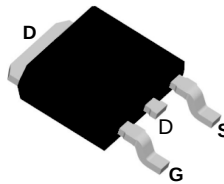
 $V_{DS} = 100V$ $I_D = 50A$ $R_{DS(ON)} = 20 m\Omega (typ.) @ V_{GS} = 10V$

100% UIS Tested

100% R_g Tested

Marking: G50N10

D:TO-252-3L

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

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		± 20	V
I_D	Continuous Drain Current	$T_C = 25^\circ C$	50	A
		$T_C = 100^\circ C$	30	A
I_{DM}	Pulsed Drain Current ^{note1}		150	A
EAS	Single Pulsed Avalanche Energy ^{note2}		62.6	mJ
P_D	Power Dissipation	$T_C = 25^\circ C$	73	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		2.0	$^\circ C/W$
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +175	$^\circ C$

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N-Channel Enhancement Mosfet
Electrical Characteristics ($T_J=25^{\circ}\text{C}$ 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	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =100V, 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	1.0	1.5	2.5	V
R _{DS(on)}	Static Drain-Source on-Resistance note2	V _{GS} =10V, I _D =20A	-	20	30	mΩ
		V _{GS} =4.5V, I _D =10A	-	24	34	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	3727	-	pF
C _{oss}			-	80	-	pF
C _{rss}	Reverse Transfer Capacitance		-	148	-	pF
Q _g	Total Gate Charge	V _{DS} =30V, I _D =15A, V _{GS} =10V	-	40	-	nC
Q _{gs}	Gate-Source Charge		-	6.2	-	nC
Q _{gd}	Gate-Drain(“Miller”) Charge		-	28	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =30V, I _D =15A, R _G =1.8Ω, V _{GS} =10V	-	22	-	ns
t _r	Turn-on Rise Time		-	182	-	ns
t _{d(off)}	Turn-off Delay Time		-	80	-	ns
t _f	Turn-off Fall Time		-	142	-	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		-	-	150	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	IF=30A,dl/dt=100A/μs	-	71	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	145	-	nC

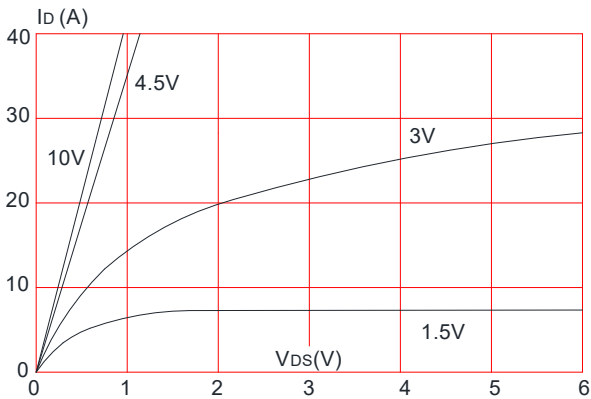
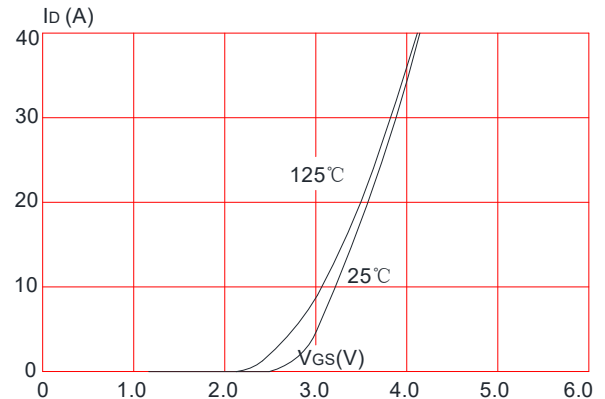
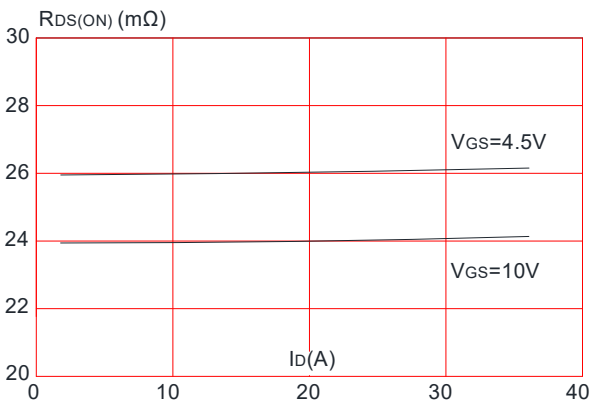
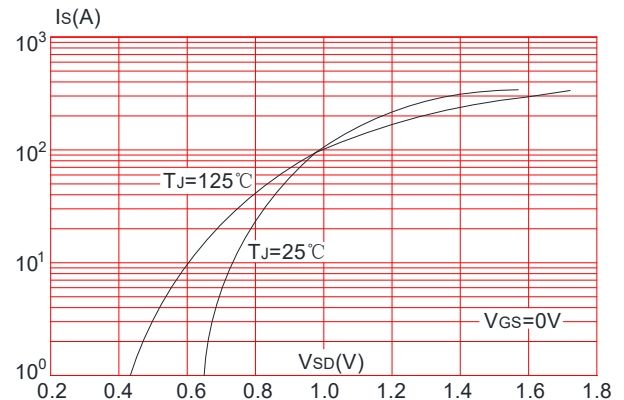
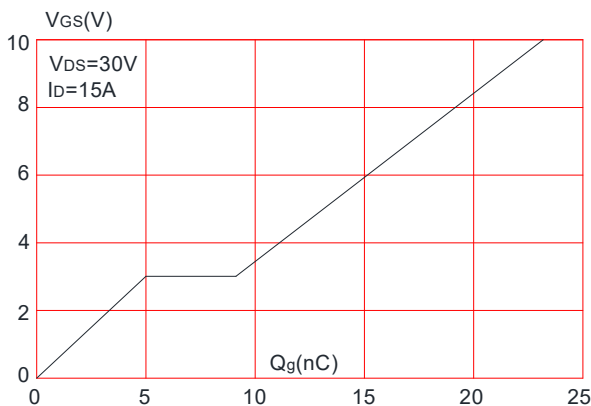
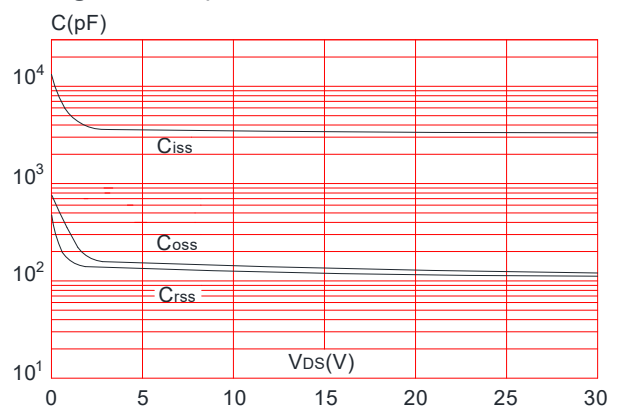
Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

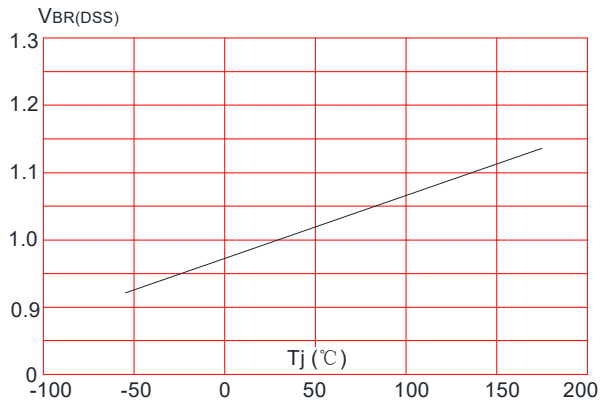
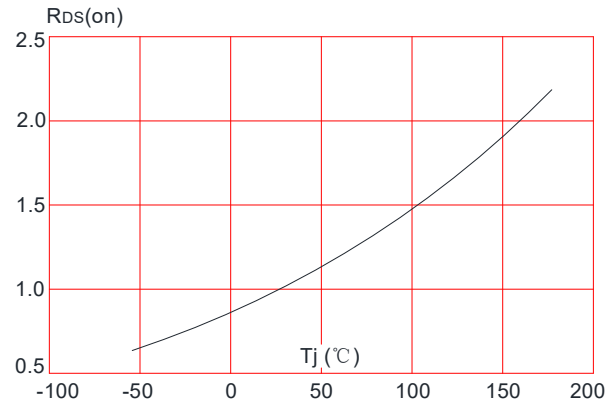
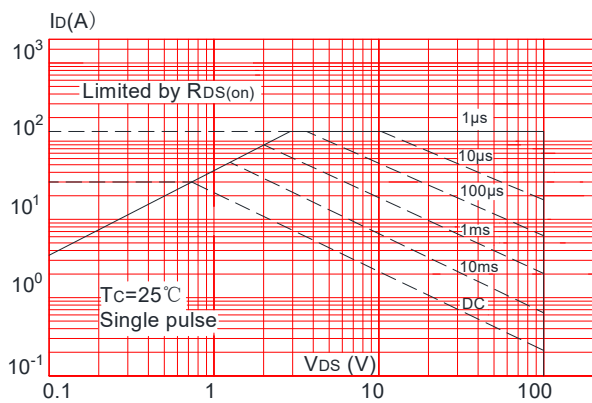
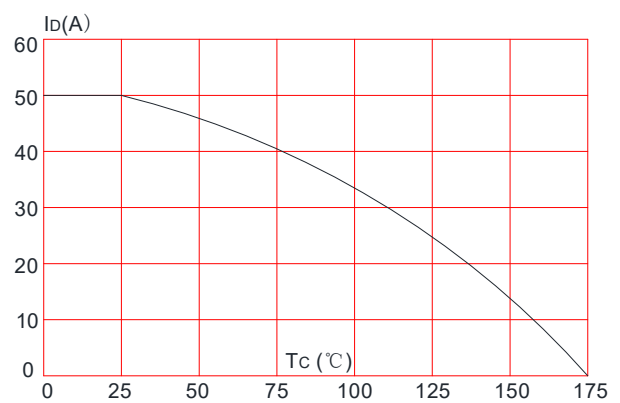
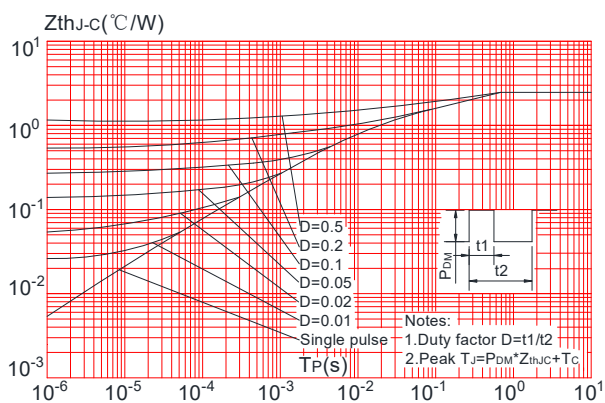
 2. EAS condition : $T_J=25^{\circ}\text{C}$, $V_{DD}=50V$, $V_G=10V$, $L=0.5mH$, $R_G=25\Omega$, $I_{AS}=14.5A$

 3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

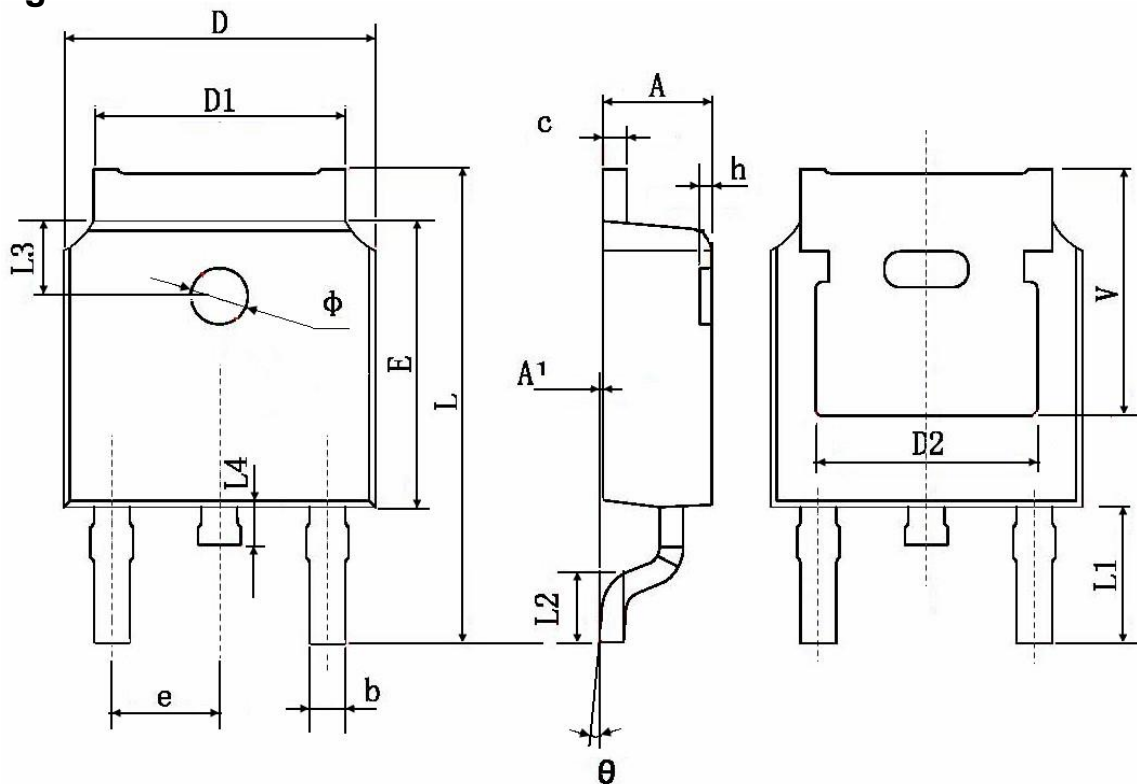


Typical Performance Characteristics

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**

**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.	