

MS280N10TLG2

100V N-Channel Enhancement Mode MOSFET

Description

The MS280N10TLG2 uses advanced **SGTrr** technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 10V. This device is suitable for use as a Battery protection or in other Switching application.

General Features

$V_{DS} = 100V$ $I_D = 280A$

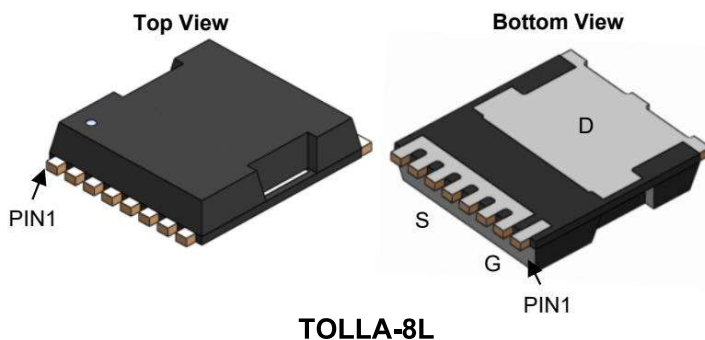
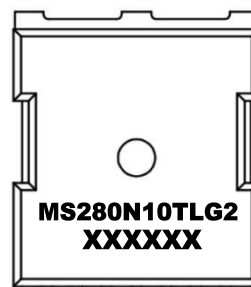
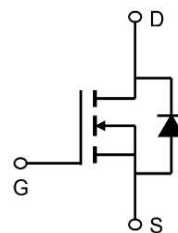
$R_{DS(ON)} < 2.6m\Omega$ @ $V_{GS}=10V$ (Type: $2.0m\Omega$)

Application

DC/DC Converter

LED Backlighting

Power Management Switches



TOLLA-8L

Package Marking and Ordering Information

Product ID	Package	Marking	Qty(PCS)
MS280N10TLG2	TOLLA-8L	MS280N10TLG2 XXXXXX	800

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

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	280	A
$I_D@T_C=100^\circ\text{C}$	Continuous Drain Current, V_{GS} @ 10V	183	A
IDM	Pulsed Drain Current	900	A
EAS	Single Pulse Avalanche Energy	1028	mJ
IAS	Avalanche Current	54	A
$P_D@T_C=25^\circ\text{C}$	Total Power Dissipation ⁴	379	W
TSTG	Storage Temperature Range	-55 to 175	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 175	$^\circ\text{C}$
$R_{\theta JA}$	Thermal Resistance Junction-Ambient	40	$^\circ\text{C/W}$
$R_{\theta JC}$	Thermal Resistance Junction-Case	0.33	$^\circ\text{C/W}$

Electrical Characteristics (T_C=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	100	110	-	V
IGSS	Gate-body Leakage current	V _{DS} =0V, V _{GS} = ±20V	-	-	±100	nA
IDSS	Zero Gate Voltage Drain Current T _J =25°C	V _{DS} =100V, V _{GS} =0V	-	-	1	μA
IDSS	Zero Gate Voltage Drain Current T _J =100°C		-	-	100	
VGS(th)	Gate-Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2.0	3.0	4.0	V
RDS(on)	Drain-Source on-Resistance ⁴	V _{GS} =10V, I _D =20A	-	2.0	2.6	mΩ
gfs	Forward Transconductance ⁴	V _{DS} =10V, I _D =20A	-	76	-	S
Ciss	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	-	9030	-	pF
Coss	Output Capacitance		-	1505	-	
Crss	Reverse Transfer Capacitance		-	40	-	
R _g	Gate Resistance	f =1MHz	-	2.3	-	Ω
Q _g	Total Gate Charge	V _{GS} = 10V, V _{DS} = 50V, I _D =20A	-	150	-	nC
Q _{gs}	Gate-Source Charge		-	32.5	-	
Q _{gd}	Gate-Drain Charge		-	49	-	
td(on)	Turn-on Delay Time	V _{GS} =10V, V _{DD} =50V, R _G = 3Ω, I _D = 20A	-	27	-	ns
t _r	Rise Time		-	78.5	-	
td(off)	Turn-off Delay Time		-	110	-	
t _f	Fall Time		-	86	-	
trr	Body Diode Reverse Recovery Time	I _F = 20A, dI/dt=100A/μs	-	88	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	220	-	nC
VSD	Diode Forward Voltage ⁴	I _D = 20A, V _{GS} =0V	-	-	1.2	V
IS	Continuous Source Current T _C =25°C		-	-	220	A

Notes:

- 1、The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
- 2、The data tested by pulsed , pulse width ≤ 300us , duty cycle ≤ 2%
- 3、The EAS data shows Max. rating . The test condition is V_{DD}=50V, V_{GS}=10V, L=0.5mH, I_{AS}=54A
- 4、The power dissipation is limited by 150°C junction temperature
- 5、The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

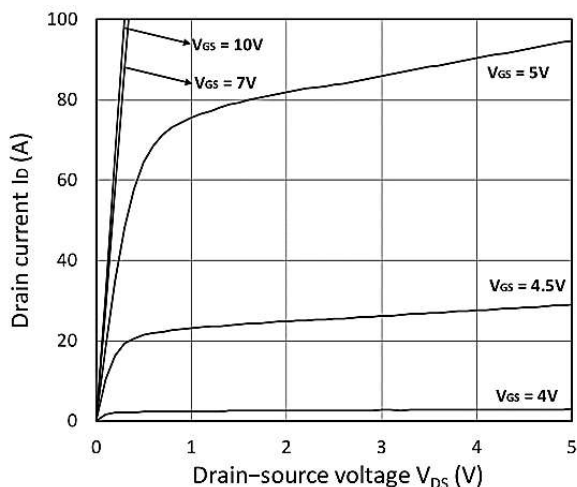


Figure 1. Output Characteristics

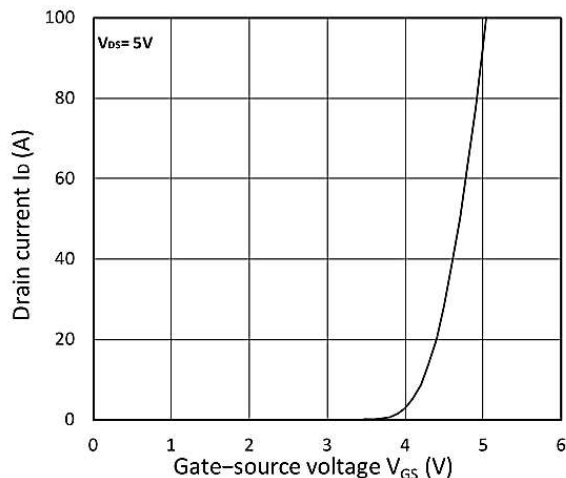


Figure 2. Transfer Characteristics

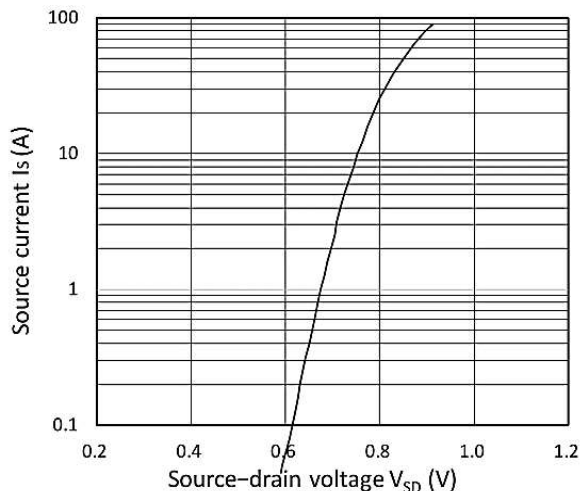


Figure 3. Forward Characteristics of Reverse

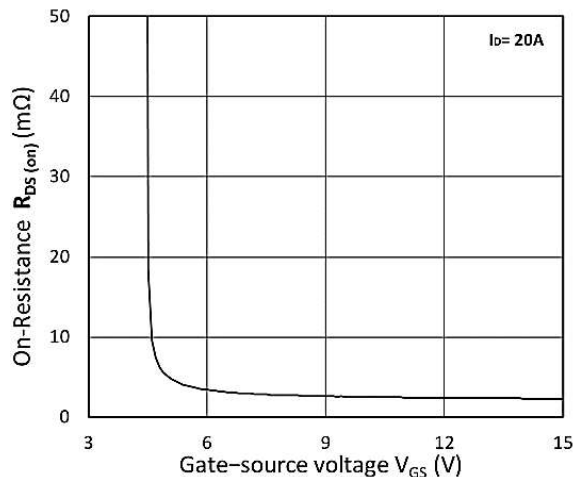


Figure 4. R_DS(ON) vs. V_GS

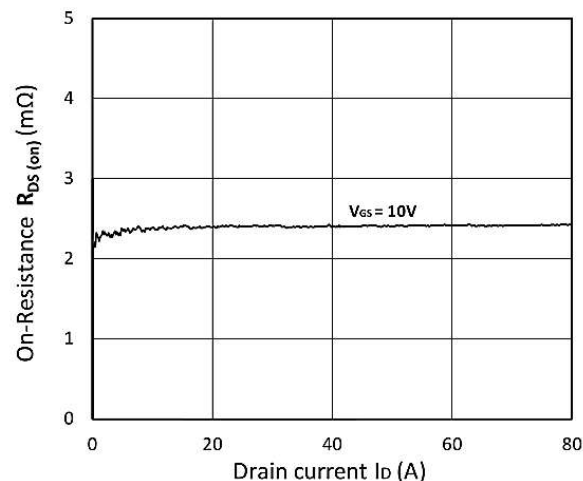


Figure 5. R_DS(ON) vs. I_D

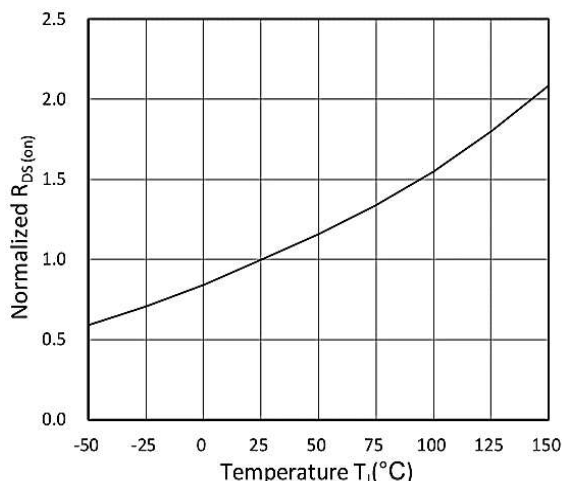


Figure 6. Normalized R_DS(on) vs. Temperature

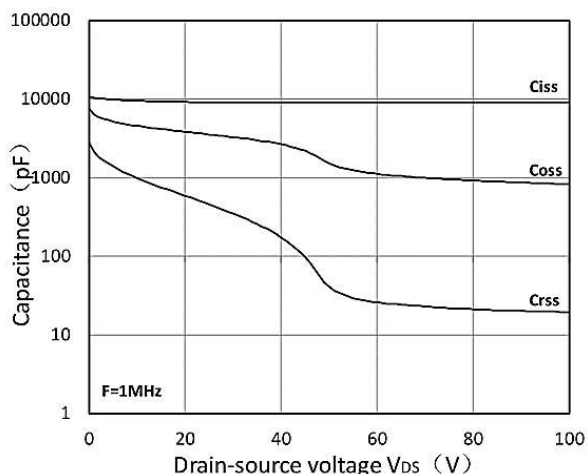


Figure 7. Capacitance Characteristics

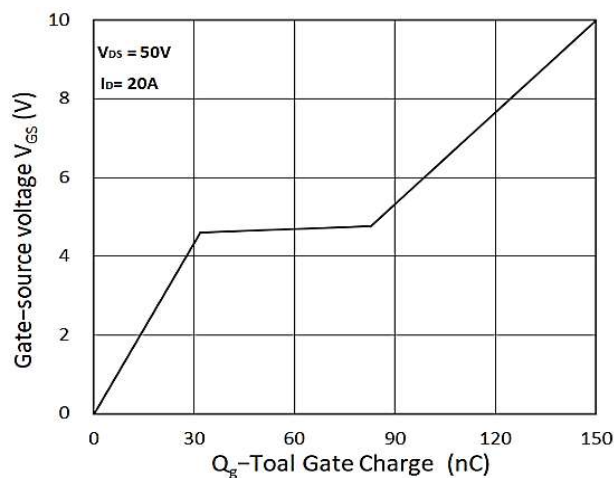


Figure 8. Gate Charge Characteristics

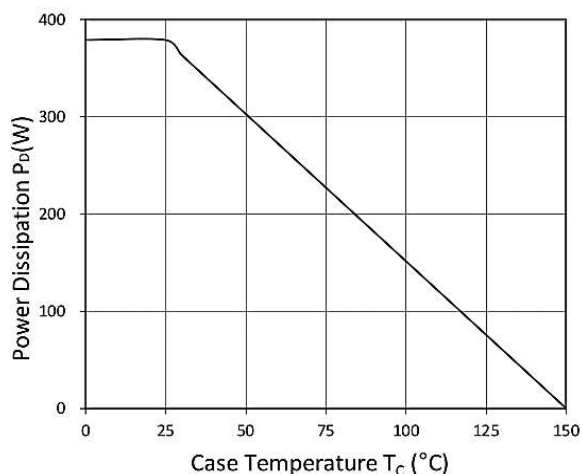


Figure 9. Power Dissipation

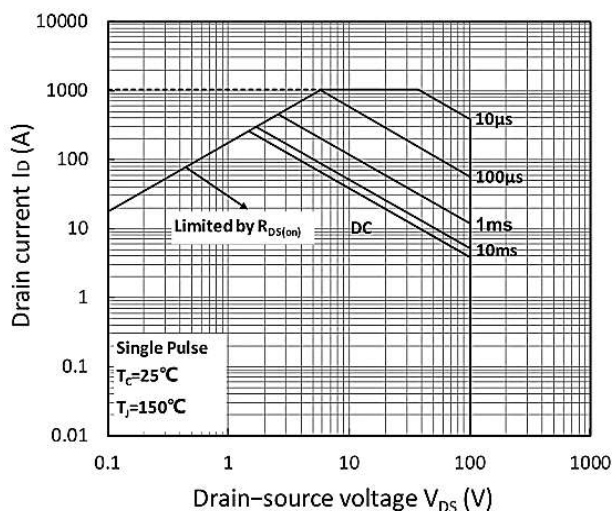


Figure 10. Safe Operating Area

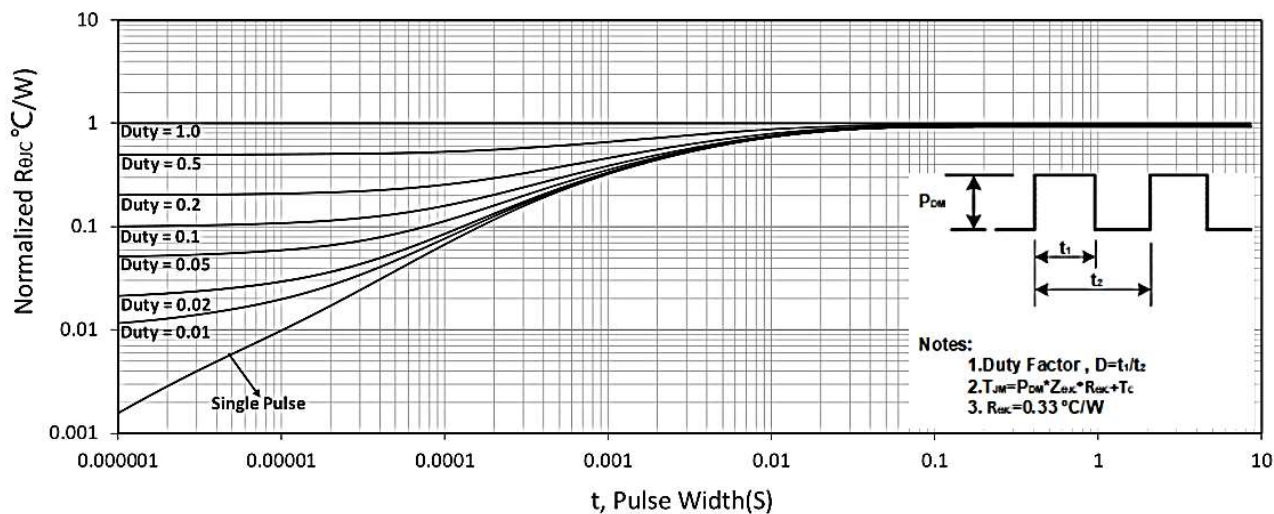
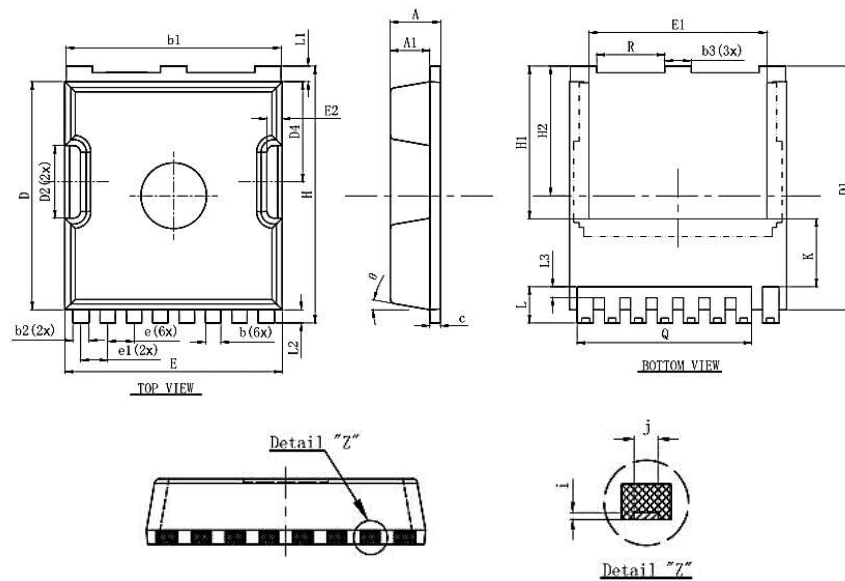


Figure 11. Normalized Maximum Transient Thermal Impedance

Package Mechanical Data-TOLLA-8L



Symbol	Dimensions In Millimeters		
	Min.	Nom	Max.
A	2.2	2.3	2.4
A1	1.7	1.8	1.9
b	0.6	0.7	0.8
b1	9.7	9.8	9.9
b2	0.65	0.75	0.85
b3	1.1	1.2	1.3
C	0.4	0.5	0.6
D	10.3	10.4	10.5
D1	11.0	11.1	11.2
D2	3.2	3.3	3.4
D4	4.47	4.57	4.67
E	9.8	9.9	10.0
E1	8.0	8.1	8.2
E2	0.5	0.6	0.7
e	1.200 (BSC)		
e1	1.225 (BSC)		
H	11.6	11.7	11.8
H1	6.95BSC		
H2	5.9BSC		
i	0.1REF		
j	0.350REF		
K	3.100REF		
L	1.55	1.65	1.75
L1	0.6	0.7	0.8
L2	0.5	0.6	0.7
L3	0.4	0.5	0.6
Q	7.95REF		
R	3.0	3.1	3.2
θ	10°REG		

Edition	Date	Change
REV1.0	2022/5/5	Initial release
REV1.1	2022/7/31	Increase voltage