

DESCRIPTION

The MXT01N10T uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.0V. This device is suitable for use as a wide variety of applications.

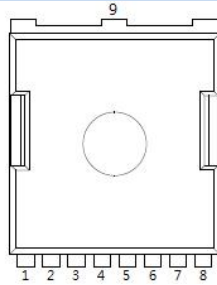
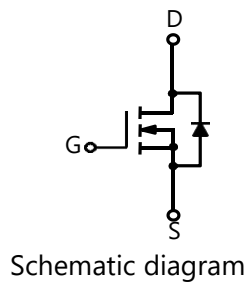
GENERAL FEATURES

- $V_{DS}=100V$, $I_D=300A$
 $R_{DS(ON)}(Typ.)=1.6m\Omega$ @ $V_{GS}=6V$
 $R_{DS(ON)}(Typ.)=1.2m\Omega$ @ $V_{GS}=10V$
- Surface-mounted package
- Advanced trench cell design

APPLICATION

- BMS appliances
- High power inverter system
- Power tool appliances

PINOUT



Pin	Description
1	Gate(G)
2/3/4/5/6/7/8	Source(S)
9	Drain(D)

ORDERING INFORMATION

Part Number	Storage Temperature	Package	Devices Per Reel
MXT01N10T	-55°C to 150°C	TOLL-8L	2000

ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage ($T_C=25^\circ C$)	V_{DS}	100	V
Gate-Source Voltage ($T_C=25^\circ C$)	V_{GS}	± 20	V
Drain Current ($T_C=25^\circ C$, $V_{GS}=10V$)	$I_D^{(Note3)}$	300	A
Drain Current ($T_C=100^\circ C$, $V_{GS}=10V$)		267	A
Drain Current-Pulsed ($T_C=25^\circ C$, $V_{GS}=10V$)	$I_{DM}^{(Note1)(Note3)}$	1200	A
Drain Power Dissipation ($T_C=25^\circ C$)	P_{tot}	500	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Continuous-Source Current ($T_C=25^\circ C$)	I_S	300	A
Single Pulsed Avalanche Energy	E_{AS}	2800	mJ

THERMAL RESISTANCE

Thermal Resistance, Junction-to-Case ^(Note2)	$R_{\theta JC}$	0.25	$^\circ C/W$
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Note 1. Surface Mounted on minimum footprint pad area.

Note 2. Pulse width $\leq 300 \mu s$, duty cycle $\leq 2\%$

Note 3. Maximum current rating is package limited.



ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
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On/Off Characteristics

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=80V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
Drain-Source On-State Resistance ^(Note1)	$R_{DS(ON)}$	$V_{GS}=6V, I_D=25A$	-	1.6	2	m Ω
		$V_{GS}=10V, I_D=50A$	-	1.2	1.4	m Ω

Dynamic Characteristics^(Note2)

Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1.0MHz$	-	13574	-	pF
Output Capacitance	C_{oss}		-	2036	-	
Reverse Transfer Capacitance	C_{rss}		-	196	-	

Switching Characteristics^(Note2)

Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=50V, V_{GEN}=10V, R_G=4.5\Omega, R_L=1\Omega, I_{DS}=50A$	-	44	-	nS
Turn-on Rise Time	t_r		-	132	-	
Turn-Off Delay Time	$t_{d(off)}$		-	154	-	
Turn-Off Fall Time	t_f		-	137	-	
Total Gate Charge	Q_g	$V_{DS}=50V, I_{DS}=50A, V_{GS}=10V$	-	167	-	nC
Gate-Source Charge	Q_{gs}		-	71	-	
Gate-Drain Charge	Q_{gd}		-	58	-	

Diode Characteristics

Diode Forward Voltage ^(Note 1)	V_{SD}	$I_{SD}=50A, V_{GS}=0V$	-	-	1.3	V
Reverse Recovery Time	t_{rr}	$I_{DS}=50A, V_{GS}=0V$	-	137	-	nS
Reverse Recovery Charge	Q_{rr}	$dI_{SD}/dt=100A/\mu s$	-	347	-	nC

Note 1. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Note 2. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS

Figure 1. Power Capability

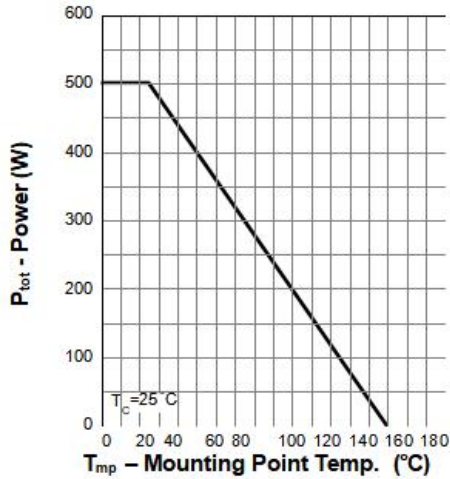


Figure 2. Current Capability

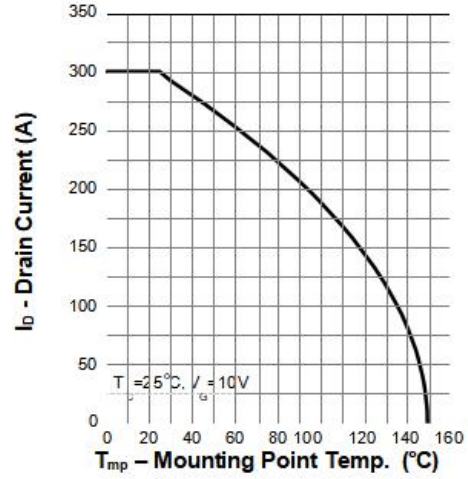


Figure 3. Safe Operating Area

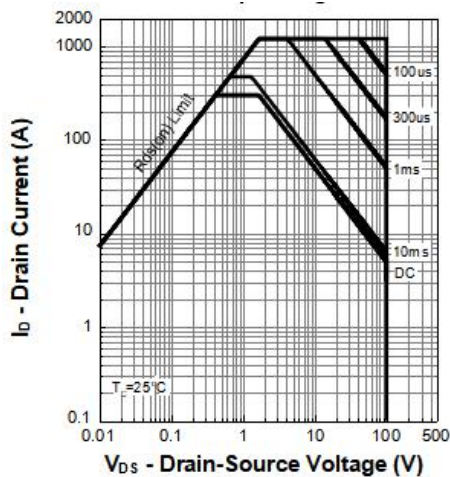


Figure 4. Transient Thermal Impedance

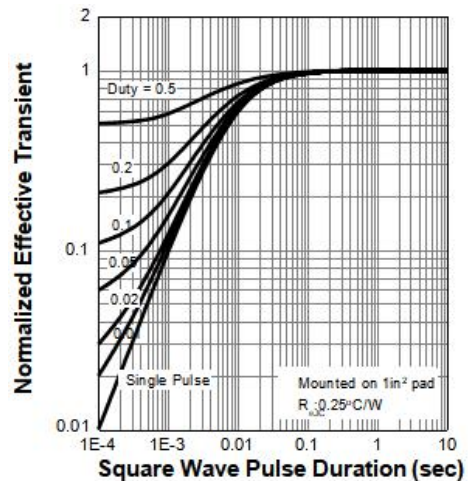


Figure 5. Output Characteristics

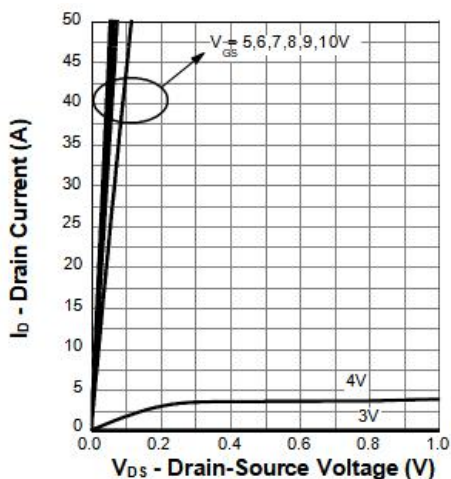
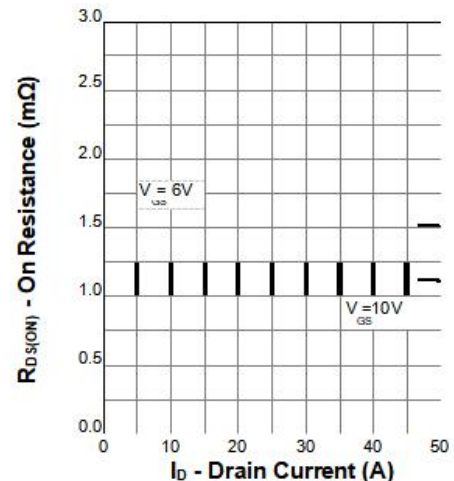


Figure 6. On Resistance





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Transfer Characteristics

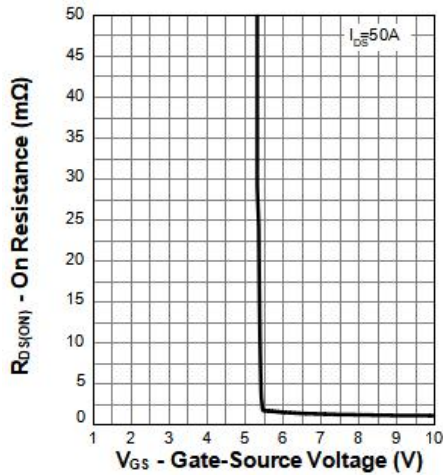


Figure 8. Normalized Threshold Voltage

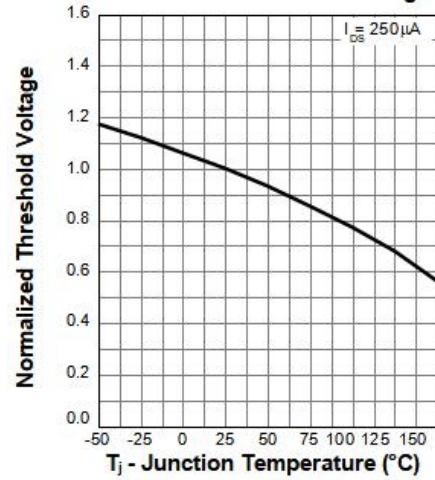


Figure 9. Normalized On Resistance

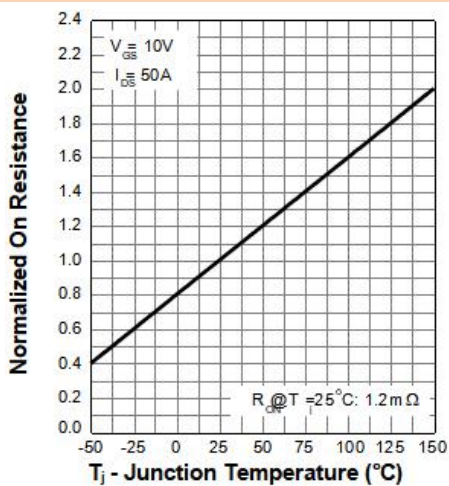


Figure 10. Diode Forward Current

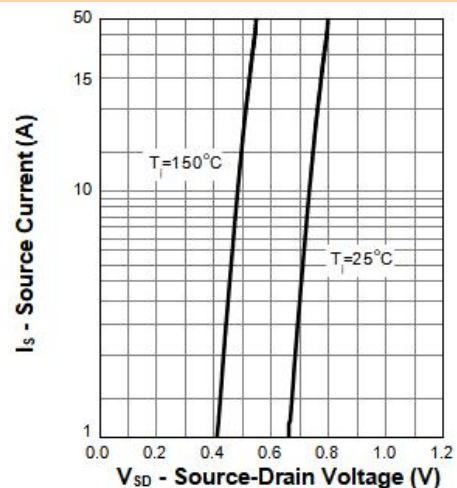


Figure 11. Capacitance

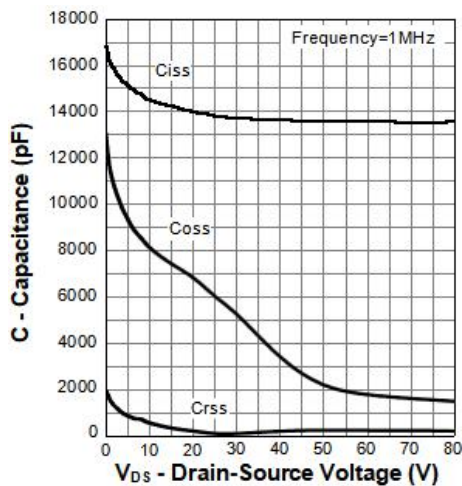
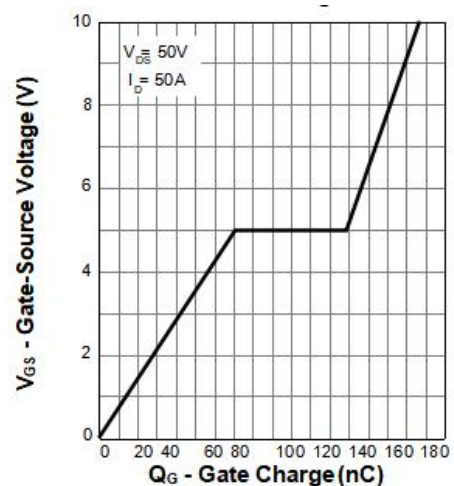
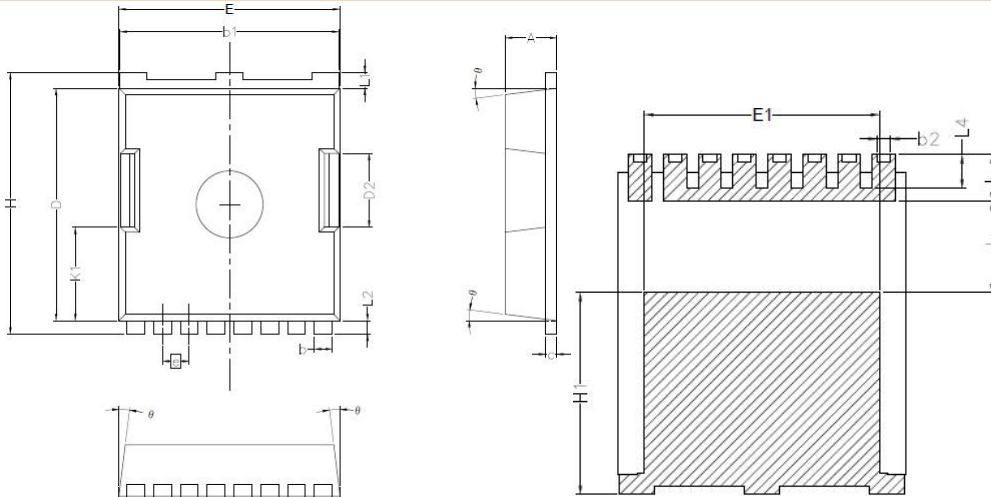


Figure 12. Gate Charge



PACKAGE INFORMATION

TOLL-8L



Symbol	Dimensions In Millimeters	
	MIN	MAX
A	2.20	2.40
b	0.90	0.90
b1	9.70	9.90
b2	0.42	0.50
c	0.40	0.60
D	10.28	10.58
D2	3.10	3.50
E	9.70	10.10
E1	7.90	8.30
e	1.20BSC	
H	11.48	11.88
H1	6.75	7.15
N	8	
J	3.00	3.30
K1	3.98	4.38
L	1.40	1.80
L1	0.60	0.80
L2	0.50	0.70
L4	1.00	1.30
θ	4°	10°