

## DESCRIPTION

The MXT01N12 uses advanced trench technology to provide excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

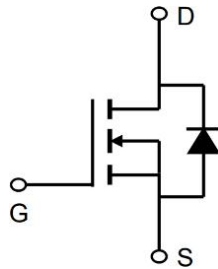
## GENERAL FEATURES

- $V_{DS}=120V$ ,  $I_D=300A$   
 $R_{DS(ON)}(Typ.)=2.2m\Omega @ V_{GS}=6V$   
 $R_{DS(ON)}(Typ.)=1.6m\Omega @ V_{GS}=10V$
- Surface-mounted package
- Advanced trench cell design

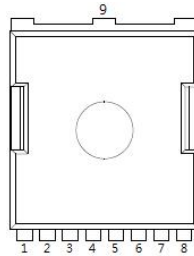
## APPLICATION

- LCD TV appliances
- High Power inverter system
- LCDM appliances

## PINOUT



Schematic diagram



Top View TOLL-8L

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
MXT01N12	-55°C to 150°C	TOLL-8L	2000

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	120	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current ( $V_{GS}=10V$ ) <sup>(Note1)(Note3)</sup>	$I_D$	300	A
Drain Current ( $V_{GS}=10V$ , $T_C=100^\circ C$ ) <sup>(Note1)(Note3)</sup>	$I_D$	200	A
Pulsed Drain Current <sup>(Note2)(Note3)</sup>	$I_{DM}$	400	A
Continuous-Source Current	$I_S$	300	A
Drain Power Dissipation	$P_{tot}$	500	W
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ C$
Thermal Resistance, Junction-to-Ambient <sup>(Note1)</sup>	$R_{\theta JA}$	40	$^\circ C/W$
Thermal Resistance, Junction-to-Case <sup>(Note1)</sup>	$R_{\theta JC}$	0.25	$^\circ C/W$

Note 1. Surface Mounted on 1 in<sup>2</sup> pad area,  $t \leq 10$  sec

Note 2. Pulse width  $\leq 10\mu s$ , duty cycle  $\leq 1\%$

Note 3. limited by bonding wire

Note 4. Surface Mounted on minimum footprint pad area.



## N-Channel Enhancement Mode Power MOSFET **MXT01N12**



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

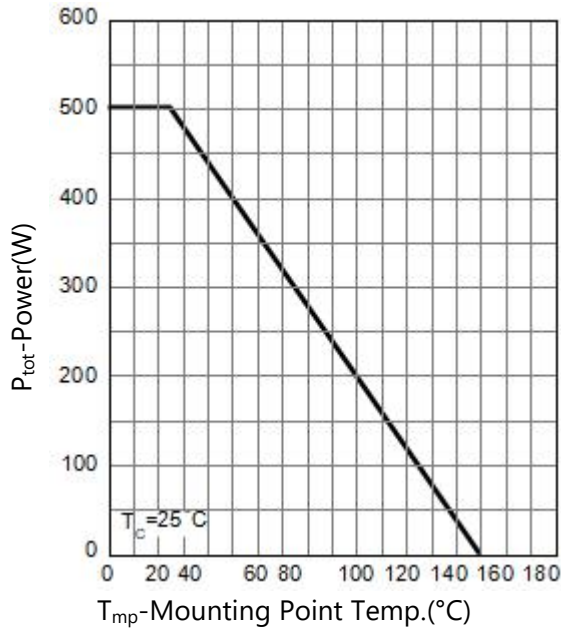
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	120	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=96V, V_{GS}=0V$	-	-	1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	-	4	V
Drain-Source On-State Resistance <sup>(Note1)</sup>	$R_{DS(on)}$	$V_{GS}=6V, I_D=30A$	-	2.2	2.5	m $\Omega$
		$V_{GS}=10V, I_D=50A$	-	1.6	2.0	m $\Omega$
<b>Dynamic Characteristics<sup>(Note2)</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS}=60V, V_{GS}=0V,$ $F=1.0MHz$	-	13540	-	pF
Output Capacitance	$C_{oss}$		-	1164	-	pF
Reverse Transfer Capacitance	$C_{rss}$		-	164	-	pF
<b>Switching Characteristics<sup>(Note2)</sup></b>						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=60V, I_{DS}=50A,$ $V_{GEN}=10V,$ $R_G=3.9\Omega, R_L=1.2\Omega,$	-	43	-	nS
Turn-on Rise Time	$t_r$		-	112	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	136	-	nS
Turn-Off Fall Time	$t_f$		-	87	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=60V, I_{DS}=50A,$ $V_{GS}=10V$	-	237	-	nC
Gate-Source Charge	$Q_{gs}$		-	82	-	nC
Gate-Drain Charge	$Q_{gd}$		-	61	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage <sup>(Note1)</sup>	$V_{SD}$	$V_{GS}=0V, I_{SD}=50A$	-	-	1.3	V
Reverse Recovery Time	$t_{rr}$	$V_{GS}=0V, I_{DS}=50A,$ $di/dt=100A/\mu s$	-	116	-	nS
Reverse Recovery Charge	$Q_{rr}$		-	355	-	nC

Note 1. The data tested by pulsed , pulse width  $\leq 300\mu s$  , duty cycle  $\leq 2\%$

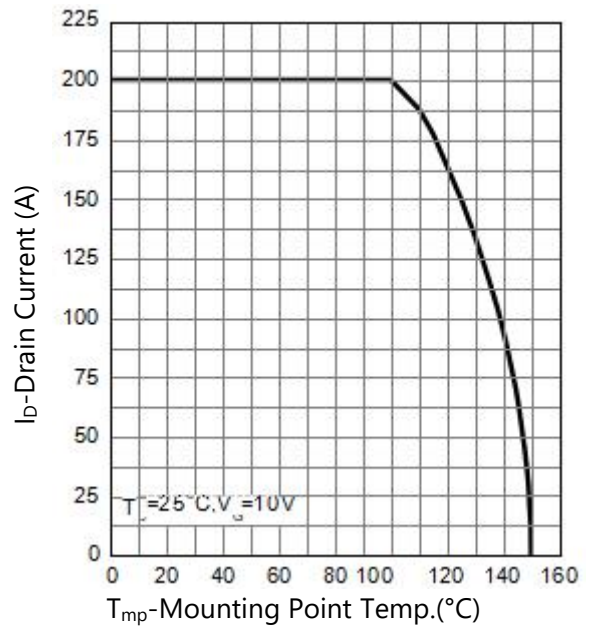
Note 2. Guaranteed by design, not subject to production testing

**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

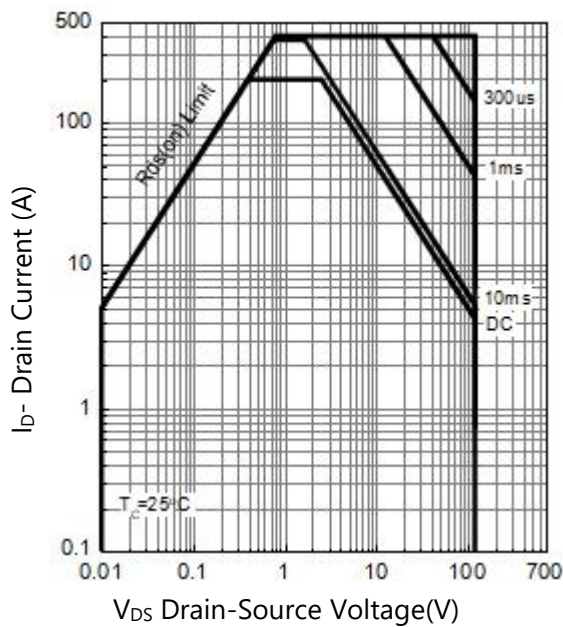
**Figure 1. Power Capability**



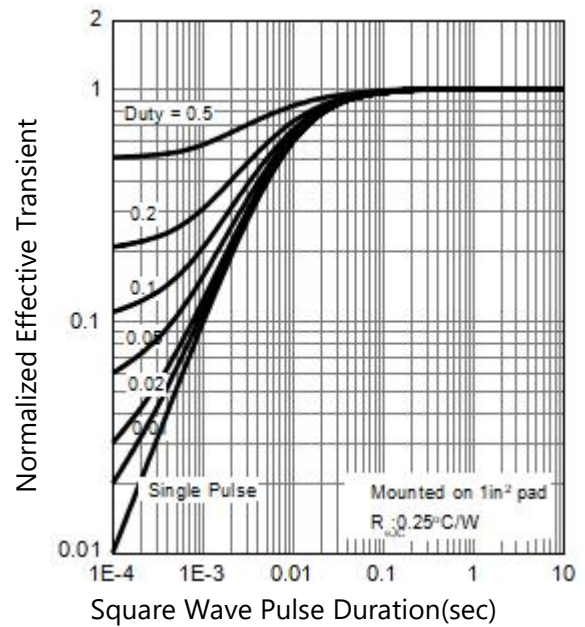
**Figure 2. Current Capability**



**Figure 3. Safe Operation Area**

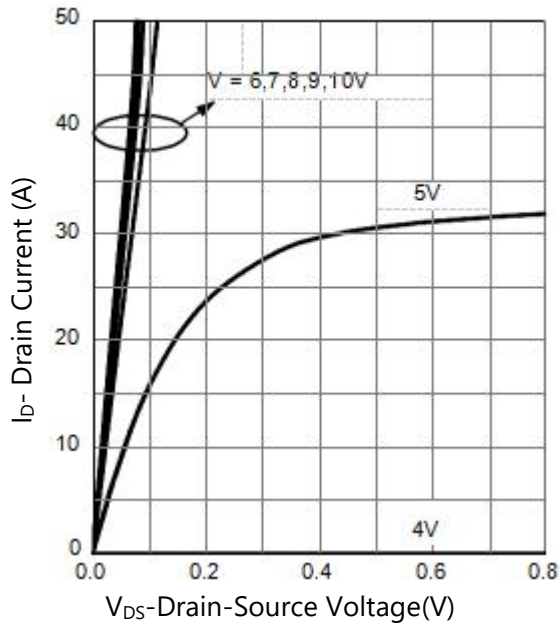


**Figure 4. Transient Thermal Impedance**

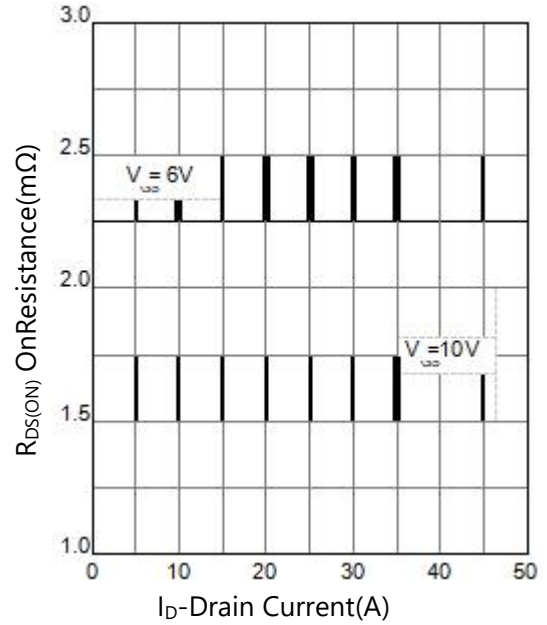


**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

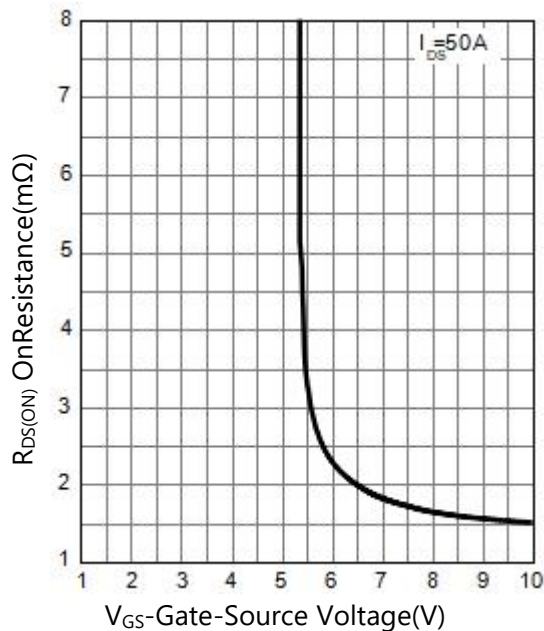
**Figure 5. Output Characteristics**



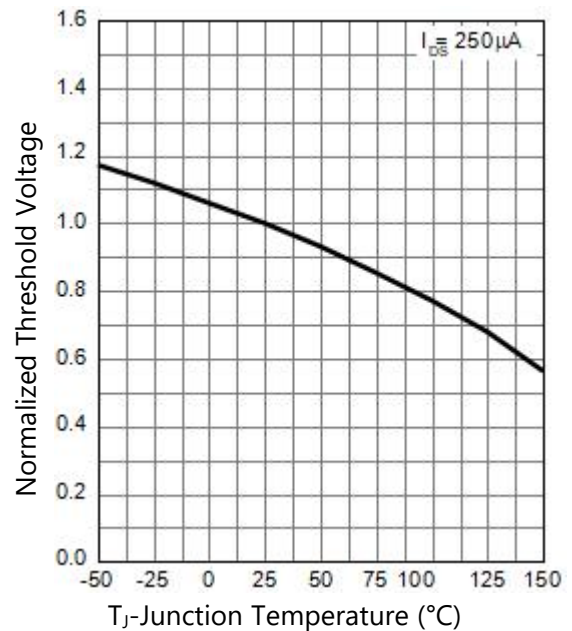
**Figure 6. On Resistance**



**Figure 7. Transfer Characteristics**



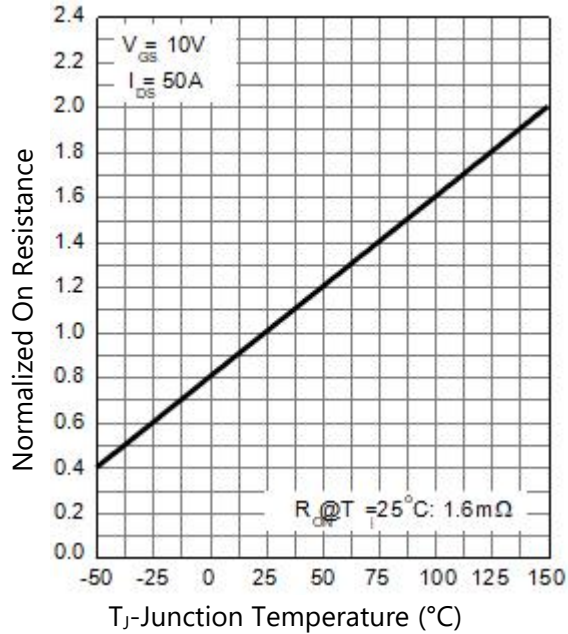
**Figure 8. Normalized Threshold Voltage**



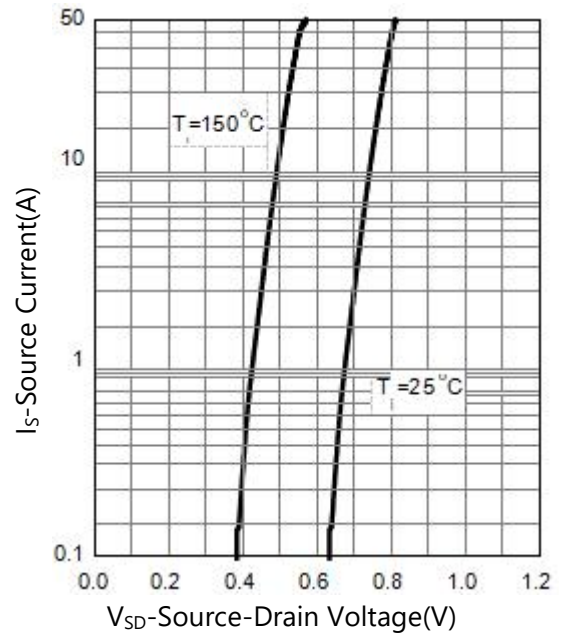


**TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS**

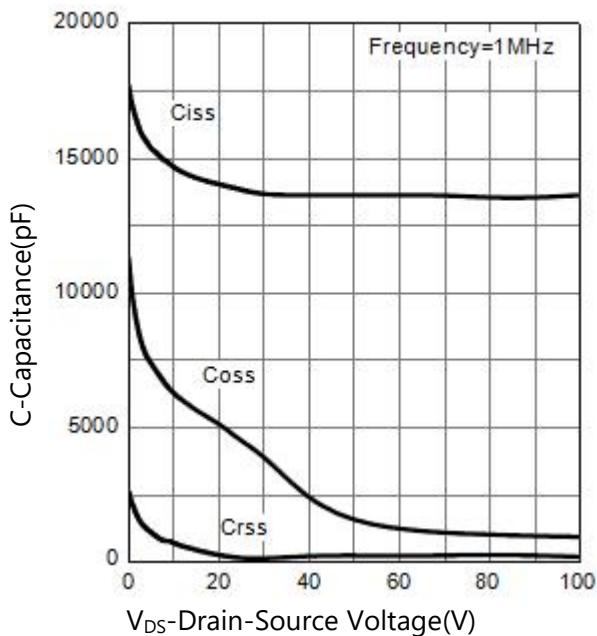
**Figure 9. Normalized On Resistance**



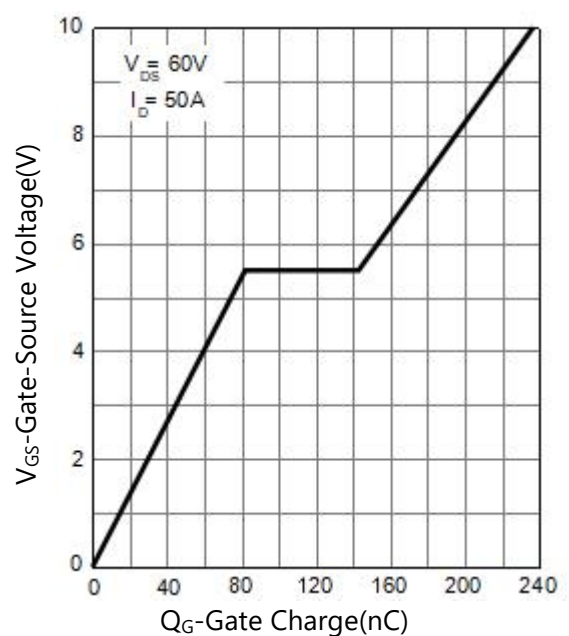
**Figure 10. Diode Forward Current**



**Figure 11. Capacitance**

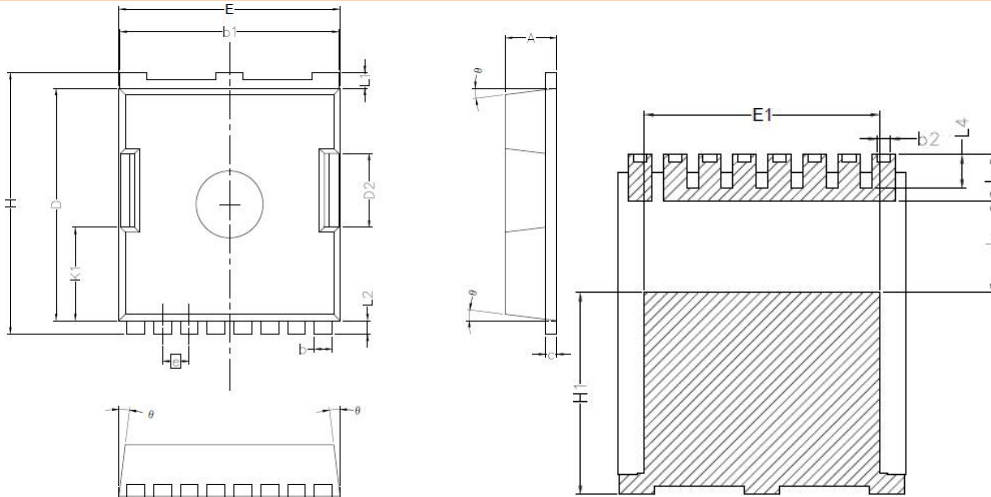


**Figure 12. Gate Charge**



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°