



N-Channel Enhancement Mode Power MOSFET **MXT08N04T**

DESCRIPTION

The MXT08N04T uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge and operation with gate voltages as low as 1.5V. This device is suitable for use as a wide variety of applications.

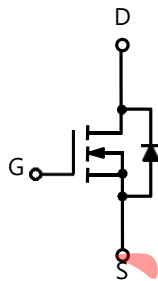
GENERAL FEATURES

- $V_{DS}=40V$, $I_D=400A$
 $R_{DS(ON)}(Typ.)=1.1m\Omega @ V_{GS}=4.5V$
 $R_{DS(ON)}(Typ.)=0.85m\Omega @ V_{GS}=10V$
- Surface-mounted package
- Advanced trench cell design
- Super Trench

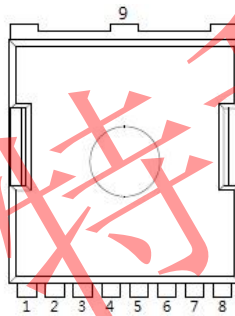
APPLICATION

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

PINOUT



Schematic diagram



Pin Assignment

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
MXT08N04T	-55°C to 150°C	TOLL-8L	000

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous (Note1)(Note3)	I_D	400	A
Drain Current-Pulsed (Note2)(Note3)	I_{DM}	1600	A
Drain Power Dissipation	P_{tot}	300	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Continuous-Source Current	I_S	400	A
Single Pulsed Avalanche Energy	E_{AS}	1352	mJ

THERMAL RESISTANCE

Thermal Resistance, Junction-to-Ambient (Note2)	$R_{\theta JA}$	40	$^\circ C/W$
Thermal Resistance, Junction-to-Case (Note2)	$R_{\theta JC}$	0.5	$^\circ C/W$

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.



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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}	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=32V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	-	2	V
Drain-Source On-State Resistance ^(Note1)	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=20A$	-	1.1	1.3	m Ω
		$V_{GS}=10V, I_D=50A$	-	0.85	1	m Ω

Dynamic Characteristics^(Note2)

Input Capacitance	C_{iss}	$V_{DS}=20V, V_{GS}=0V, F=1.0MHz$	-	8296	-	pF
Output Capacitance	C_{oss}		-	3294	-	
Reverse Transfer Capacitance	C_{rss}		-	55	-	

Switching Characteristics^(Note2)

Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=20V, V_{GEN}=10V, R_G=4.5\Omega, R_L=0.4\Omega, I_{DS}=50A$	-	19	-	nS
Turn-on Rise Time	t_r		-	84	-	
Turn-Off Delay Time	$t_{d(off)}$		-	153	-	
Turn-Off Fall Time	t_f		-	126	-	
Total Gate Charge	Q_g	$V_{DS}=20V, I_{DS}=50A, V_{GS}=10V$	-	148	-	nC
Gate-Source Charge	Q_{gs}		-	26	-	
Gate-Drain Charge	Q_{gd}		-	25	-	

Diode Characteristics

Diode Forward Voltage ^(Note 1)	V_{SD}	$I_{SD}=50A, V_{GS}=0V$	-	-	1.3	V
Reverse Recovery Time	t_{rr}	$I_{DS}=50A, V_{GS}=0V$	-	97	-	nS
Reverse Recovery Charge	Q_{rr}	$dI_{SD}/dt=100A/\mu s$	-	162	-	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.



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TYPICAL CHARACTERISTICS

Figure 1. Power Capability

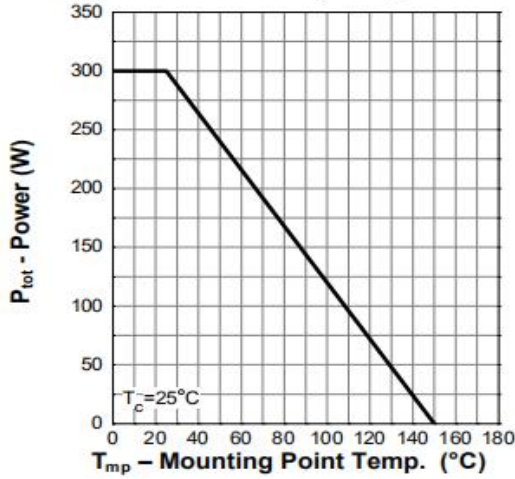


Figure 2. Current Capability

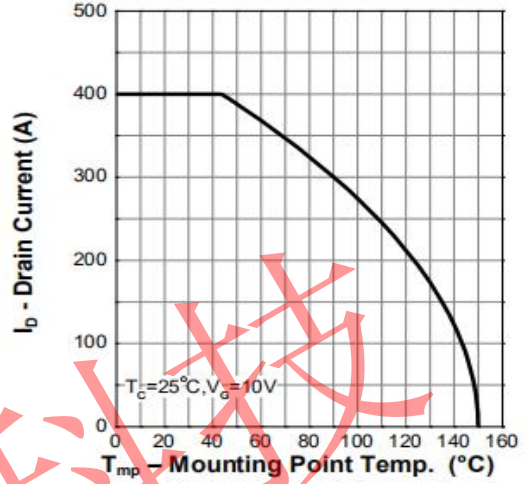


Figure 3. Safe Operating Area

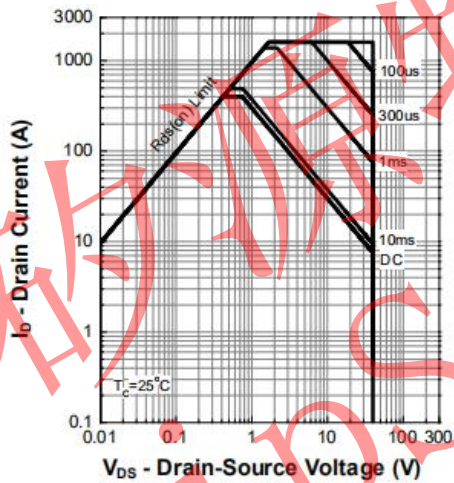


Figure 4. Transient Thermal Impedance

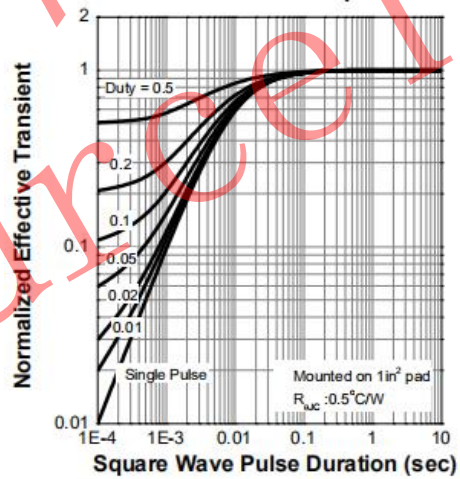


Figure 5. Output Characteristics

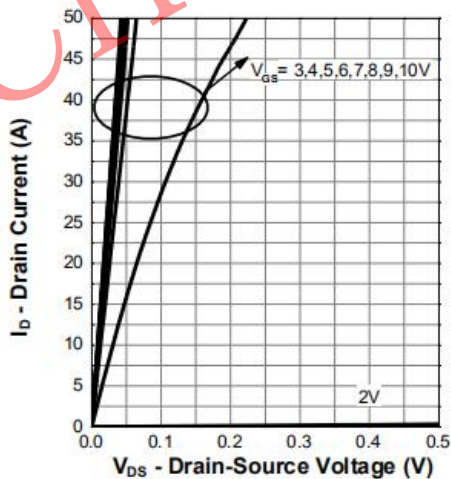
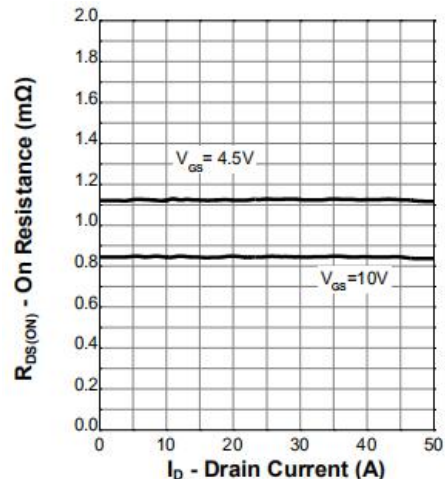


Figure 6. On Resistance





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TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Transfer Characteristics

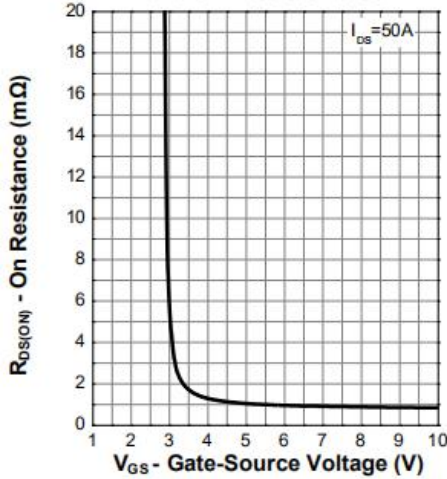


Figure 8. Normalized Threshold Voltage

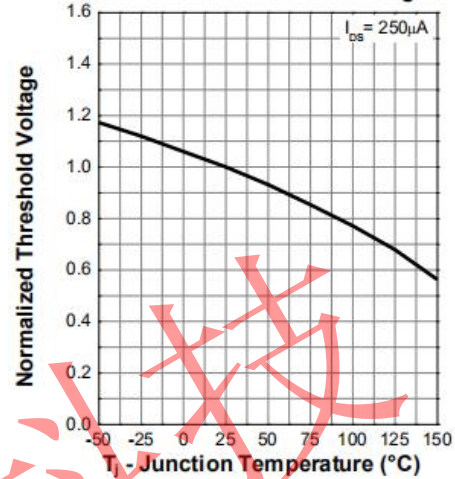


Figure 9. Normalized On Resistance

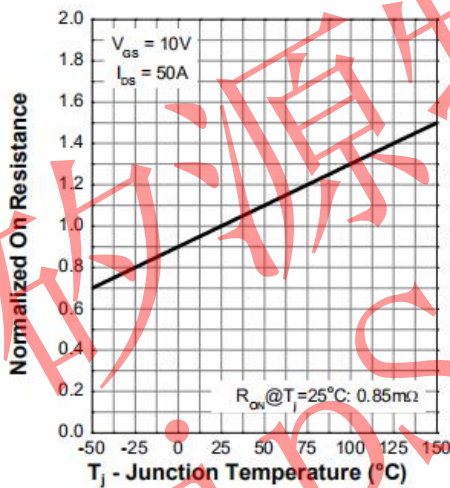


Figure 10. Diode Forward Current

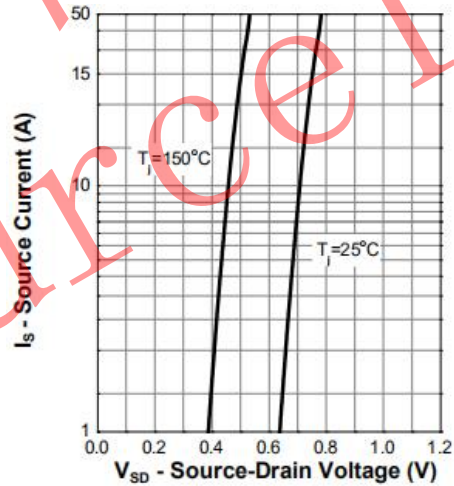


Figure 11. Capacitance

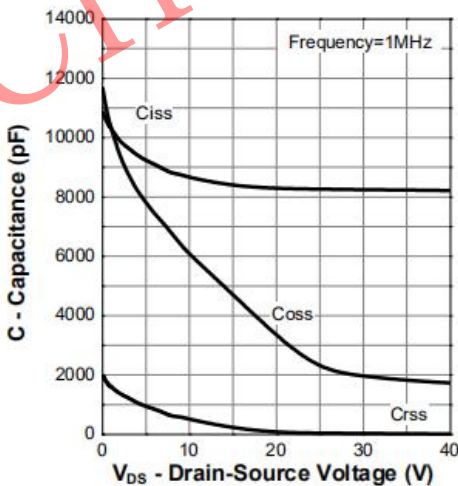
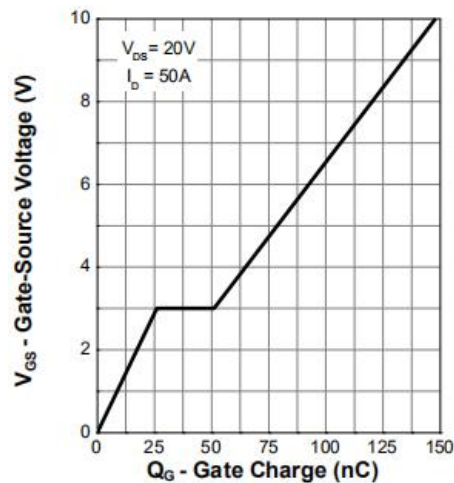


Figure 12. Gate Charge

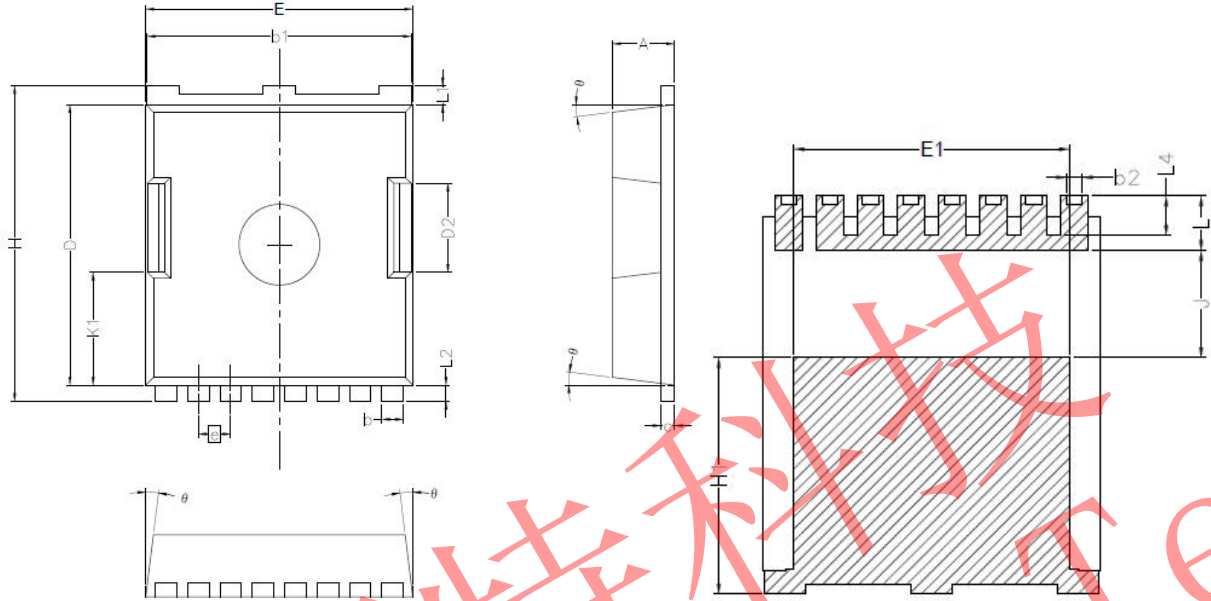




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PACKAGE INFORMATION

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°