

DESCRIPTION

The MXD30N10K uses advanced trench technology to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

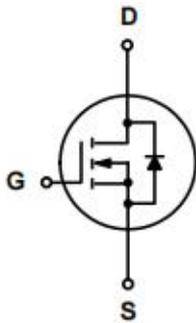
GENERAL FEATURES

- $V_{DS}=100V$, $I_D=30A$
 $R_{DS(ON)}(Typ.)=19m\Omega @ V_{GS}=10V$
 $R_{DS(ON)}(Typ.)=26m\Omega @ V_{GS}=4.5V$
- Surface-mounted package
- Advanced trench cell design

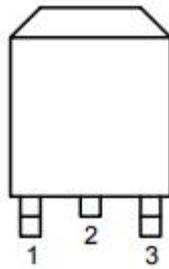
APPLICATION

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

PINOUT



Schematic diagram



TO-252 top view

Pin	Description
1	Gate(G)
2	Drain(D)
3	Source(S)

ORDERING INFORMATION

Part Number	Storage Temperature	Package	Devices Per Reel
MXD30N10K	-55°C to 150°C	TO-252	2500

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current ($V_{GS}=10V$) ^(Note1)	I_D	30	A
Drain Current ($T_C=100^\circ C$, $V_{GS}=10V$) ^(Note1)	I_D	15	A
Pulsed Drain Current ($V_{GS}=10V$) ^(Note3)	I_{DM}	96	A
Continuous-Source Current	I_S	30	A
Drain Power Dissipation	P_{tot}	50	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance, Junction-to-Ambient ^(Note2)	$R_{\theta JA}$	50	$^\circ C/W$
Thermal Resistance, Junction-to-Case ^(Note2)	$R_{\theta JC}$	2.5	$^\circ C/W$

Note1. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

Note2. Mounted on Large Heat Sink

Note3. Limited by Bonding Wire



N-Channel Enhancement Mode Power MOSFET **MXD30N10K**



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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
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}	$V_{DS}=32V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	1.8	V
Drain-Source On-State Resistance ^(Note1)	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	19	22	m Ω
		$V_{GS}=4.5V, I_D=10A$	-	26	30	m Ω
Dynamic Characteristics^(Note2)						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, F=1.0MHz$	-	822	-	pF
Output Capacitance	C_{oss}		-	310	-	pF
Reverse Transfer Capacitance	C_{rss}		-	25	-	pF
Switching Characteristics^(Note2)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=50V, I_{DS}=20A, V_{GEN}=10V, R_G=4.5\Omega, R_L=2.5\Omega,$	-	15	-	nS
Turn-on Rise Time	t_r		-	3.2	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	30	-	nS
Turn-Off Fall Time	t_f		-	7.6	-	nS
Total Gate Charge	Q_g	$V_{DS}=50V, I_{DS}=20A, V_{GS}=10V$	-	22	-	nC
Gate-Source Charge	Q_{gs}		-	6.2	-	nC
Gate-Drain Charge	Q_{gd}		-	5.3	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note1)	V_{SD}	$V_{GS}=0V, I_{SD}=20A$	-	-	1.3	V
Reverse Recovery Time	t_{rr}	$I_{DS}=20A, V_{GS}=0V, di_{SD}/dt=100A/\mu s$	-	45	-	nS
Reverse Recovery Charge	Q_{rr}		-	59	-	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

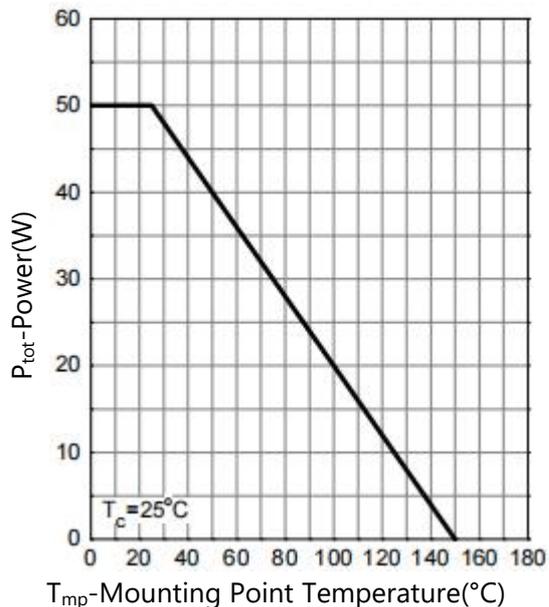


Figure 2. Current Capability

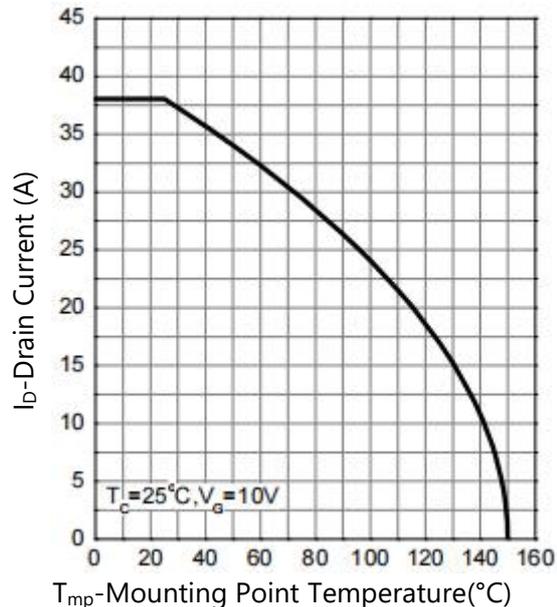


Figure 3. Safe Operation Area

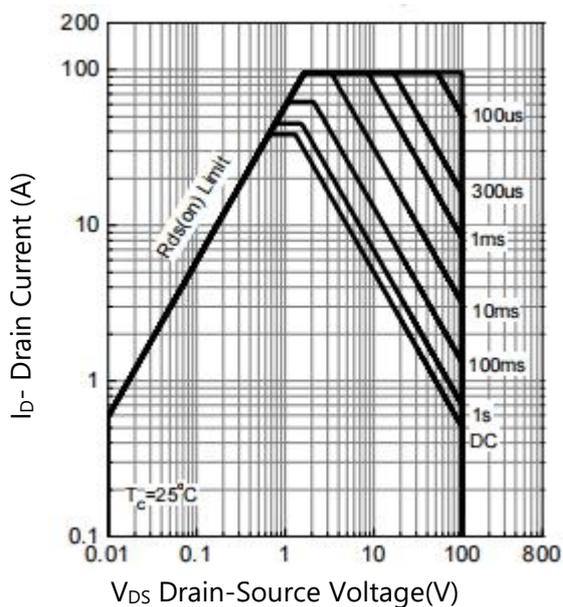
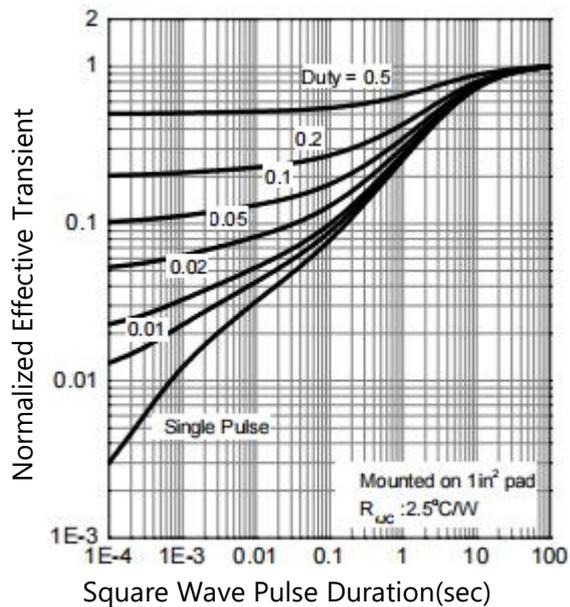


Figure 4. Transient Thermal Impedance





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 5. Output Characteristics

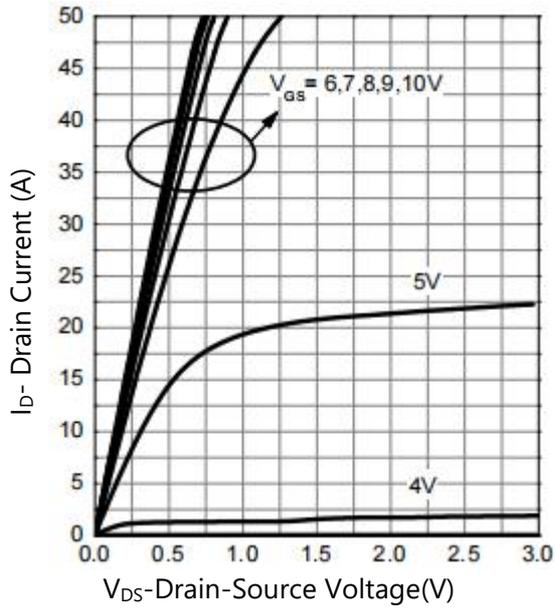


Figure 6. Drain-Source On Resistance

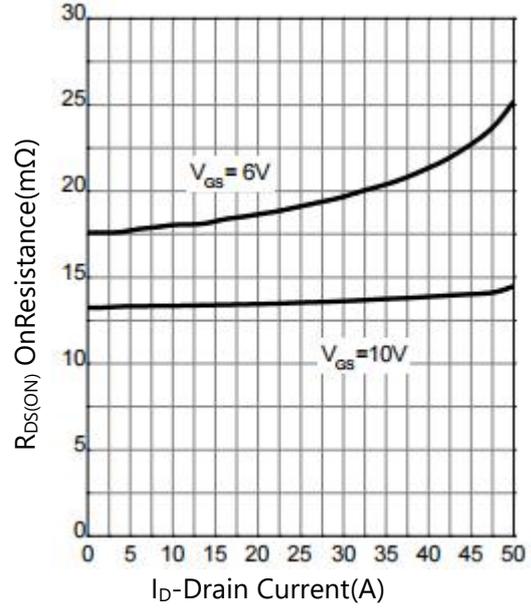


Figure 7. Transfer Characteristics

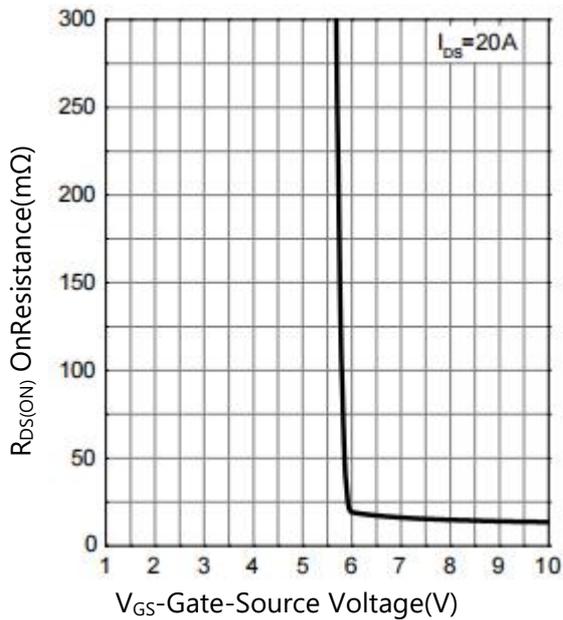
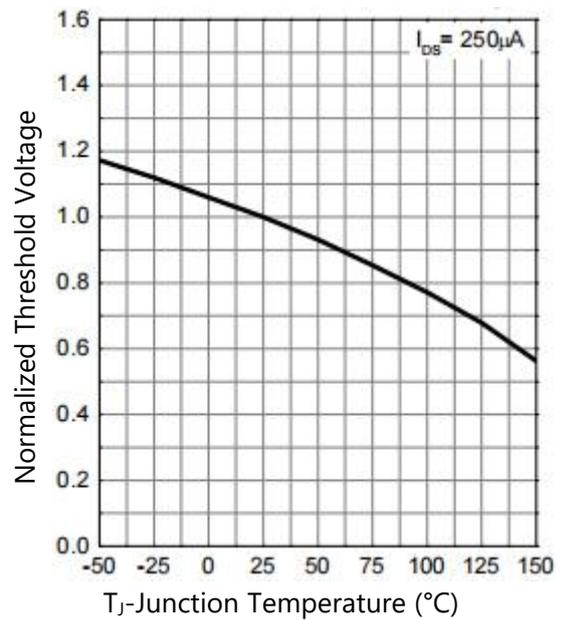


Figure 8. Normalized Threshold Voltage



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 9. Normalized On Resistance

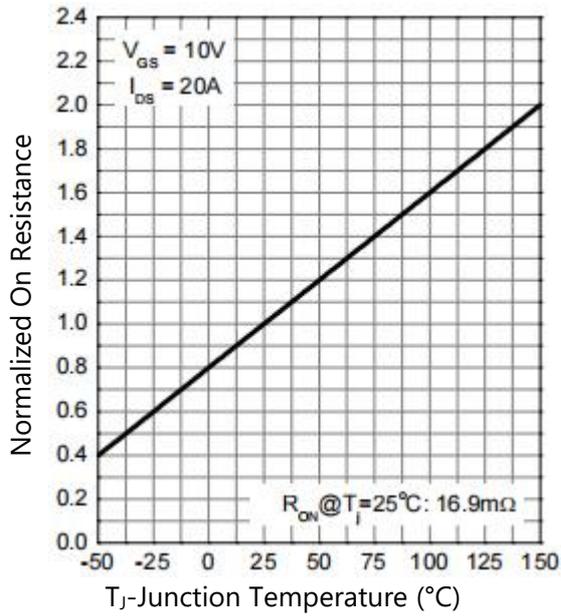


Figure 10. Diode Forward Current

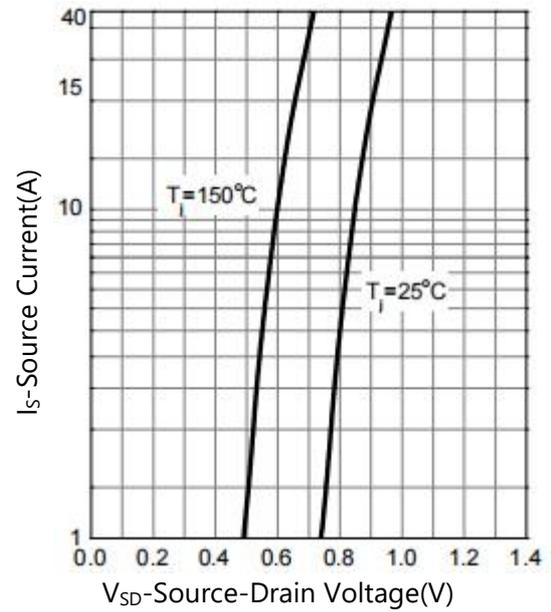


Figure 11. Capacitance

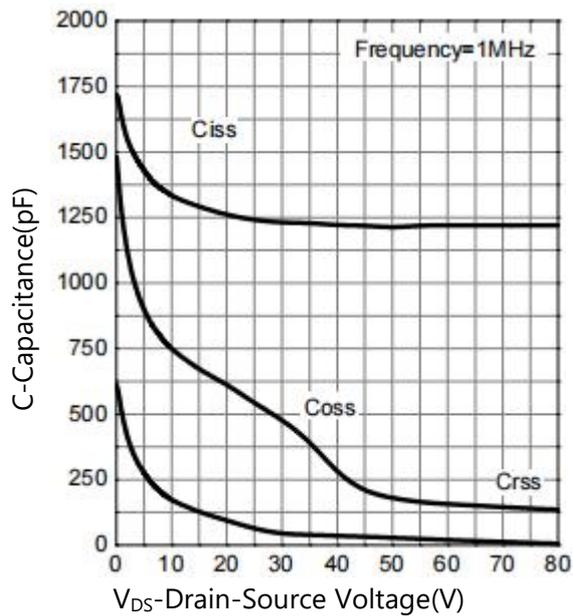
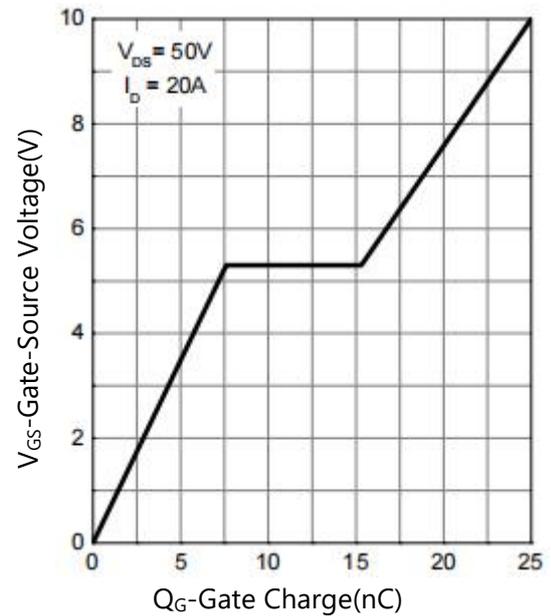
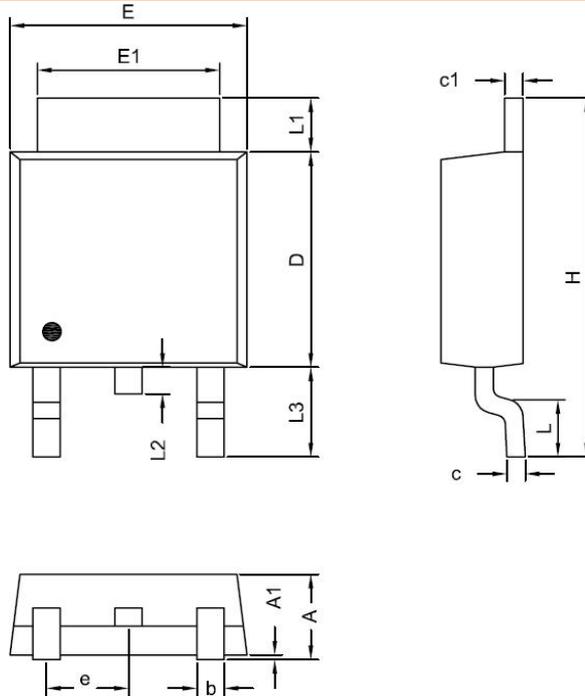


Figure 12. Gate Charge



 **PACKAGE INFORMATION**

TO252-3L



Symbol	Dimensions In Millimeters	
	MIN.	MAX.
A	2.19	2.38
A1	0.02	0.13
D	5.30	6.40
E	6.35	6.80
E1	5.20	5.50
c	0.40	0.60
c1	0.40	0.60
b	0.55	0.85
e	2.30 BCS	
L	1.00	1.80
L1	0.70	1.80
L2	0.70 BCS	
L3	2.40	2.80
H	9.20	10.40