

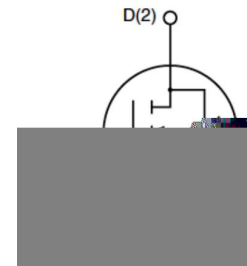
MX3N10G

N-Channel Enhancement Mode Power MOSFET

General Features

$V_{DS} = 100V$ $I_D = 2.2A$
 $V_{GS} = 4.5V$ $R_{DS(ON)}(Typ.) = 260m$
 $V_{GS} = 10V$ $R_{DS(ON)}(Typ.) = 250m$

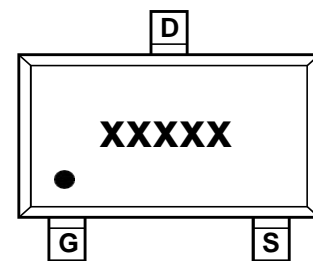
1. High power and current handling capability
2. Lead free product is acquired
3. Surface mount package



Schematic diagram

Application

1. Uninterruptible Power Supply(UPS)
2. Hard Switched and High Frequency Circuits
3. Power Switching application



Marking and pin assignment

Package

Absolute Maximum Ratings (TA=25 unless otherwise noted)

Symbol	Parameter	Max.			Units		
		SOT-23	SOT89-3	SOT-223			
V_{DSS}	Drain-Source Voltage	100			V		
V_{GSS}	Gate-Source Voltage	±20			V		
I_D	Continuous Drain Current	$T_C = 25$		2.2	A		
		$T_C = 100$		1.5	A		
I_{DM}	Pulsed Drain Current ^{note1}	12			A		
P_D	Power Dissipation	$T_A = 25$		2.5	3.9	5	W
R_{JA}	Thermal Resistance, Junction to Ambient	50	32	25	°C/W		
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150					



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Electrical Characteristics (TA=25 unless otherwise noted)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=100V, V_{GS}=0V,$	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.8	3.0	V
$R_{DS(on)}$	Static Drain-Source on-Resistance <small>note2</small>	$V_{GS}=10V, I_D=2A$	-	250	280	m
		$V_{GS}=4.5V, I_D=1A$	-	260	310	
g_{FS}	Forward Transconductance	$V_{DS}=10V, I_D=3A$	-	1.1	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=50V, V_{GS}=0V,$ $f=1.0MHz$	-	330	-	pF
C_{oss}	Output Capacitance		-	88	-	pF
C_{rss}	Reverse Transfer Capacitance		-	15	-	pF
Q_g	Total Gate Charge	$V_{DS}=50V, I_D=1A,$ $V_{GS}=10V$	-	5.2	-	nC
Q_{gs}	Gate-Source Charge		-	1.0	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	1.4	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	$V_{DD}=50V, R_L=39\Omega,$ $R_G=1\Omega, V_{GS}=10V$	-	14	-	ns
t_r	Turn-on Rise Time		-	54	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	18	-	ns
t_f	Turn-off Fall Time		-	11	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	3	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	12	A
V_{SD}	Drain to Source Diode Forward Voltage	$V_{GS}=0V, I_S=1A$	-	-	1.2	V

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. Pulse Test: Pulse Width 300 μs , Duty Cycle 2%

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t₁₀ sec.
3. Pulse Test: Pulse Width 300 μs , Duty Cycle 2%.
4. Guaranteed by design, not subject to production



Typical Performance Characteristics

Figure 1: Output Characteristics

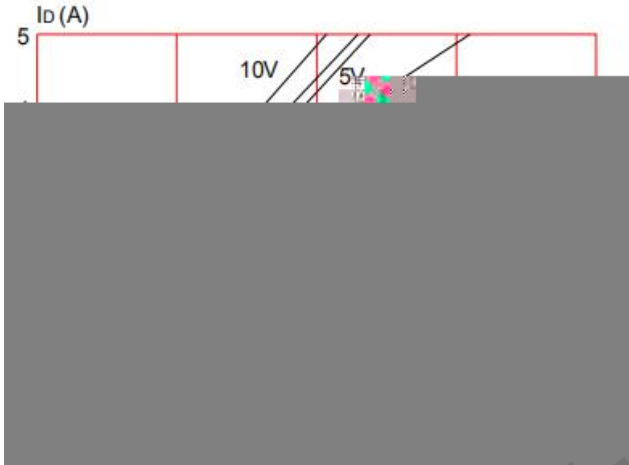


Figure 2: Typical Transfer Characteristics



Figure 3: On-resistance vs. Drain Current

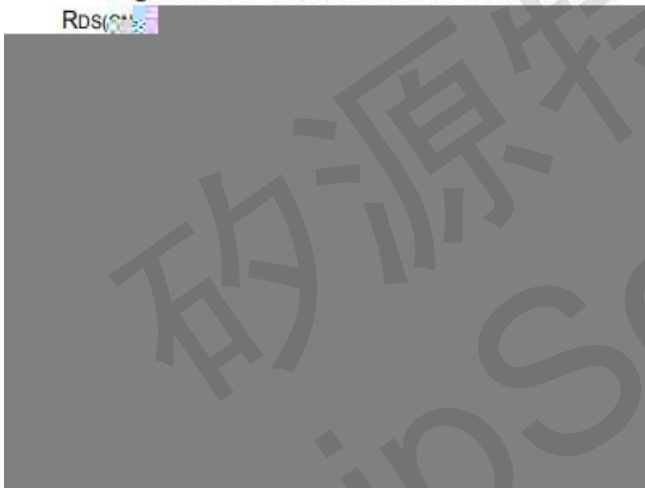


Figure 4: Body Diode Characteristics



Figure 5: Gate Charge Characteristics

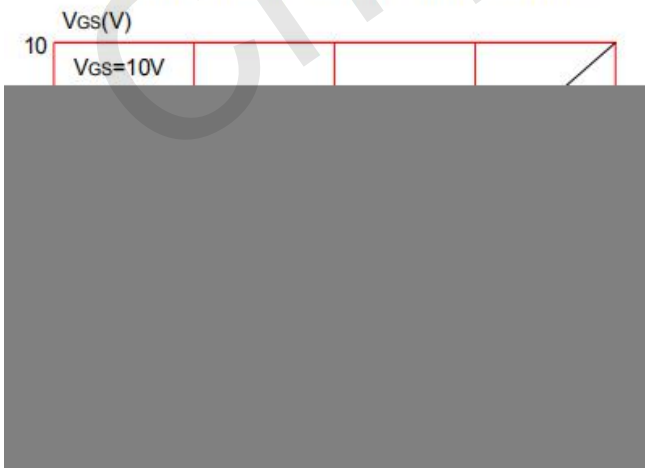
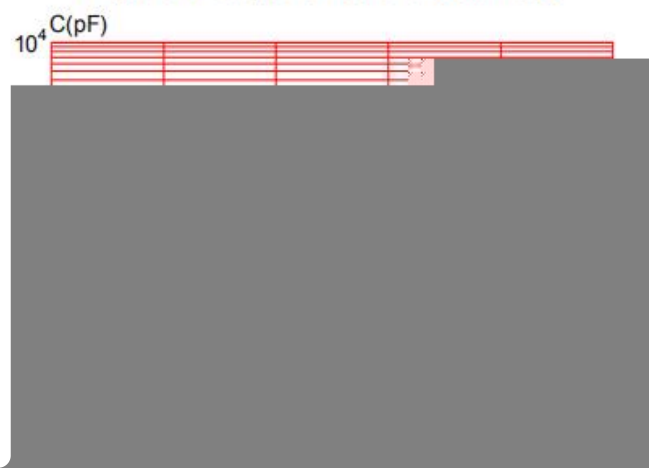


Figure 6: Capacitance Characteristics





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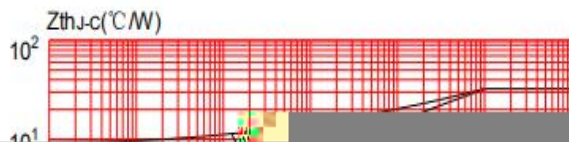
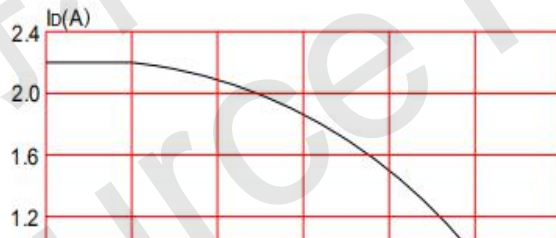
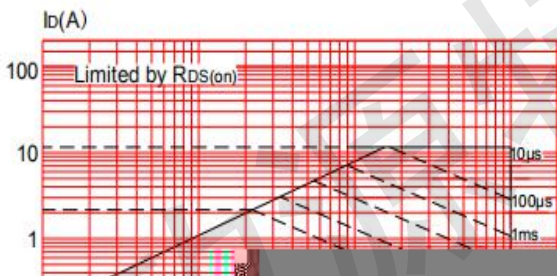
Figure 7: Normalized Breakdown Voltage vs.

Figure 8: Normalized on F



Figure 9: Maximum Safe Operating Area

Figure 10: Maximum Continuous Drain Current vs. Case Temperature



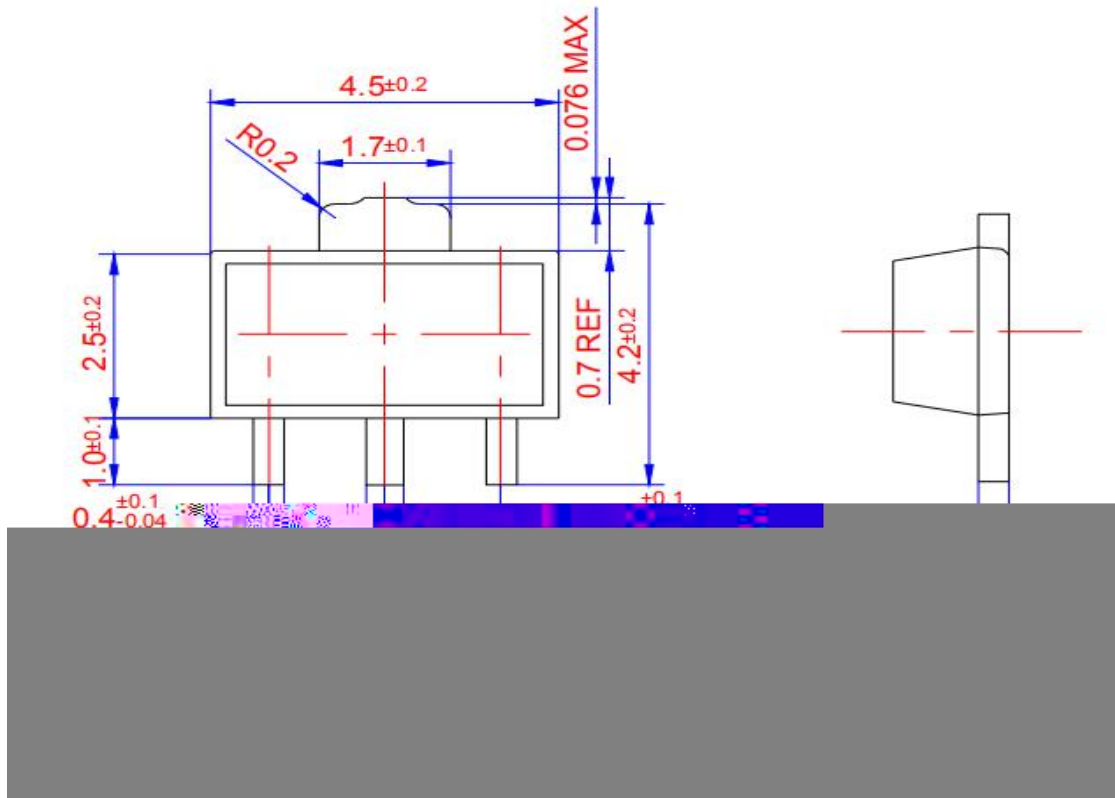


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Figure.13: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT-223)

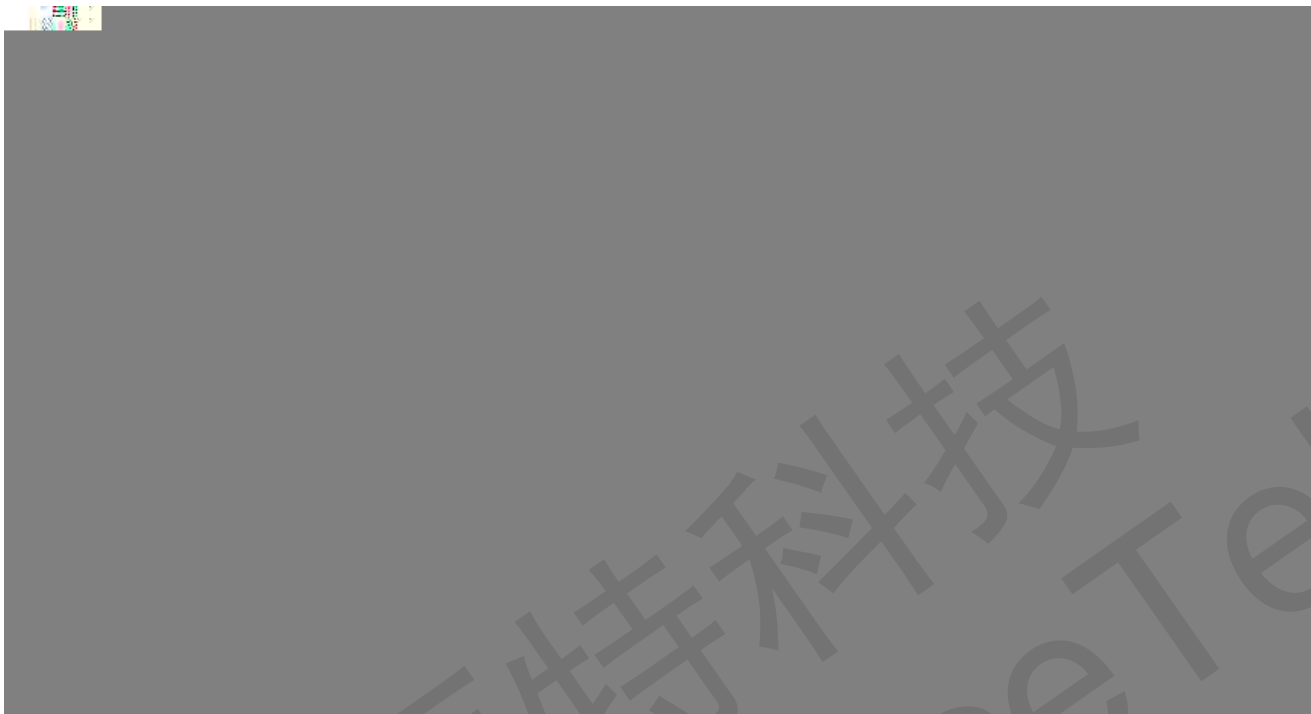


Package Mechanical Data





MX3N10G



SOT-23-3L Package Information

Dimensions



Notes

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.