

Descriptions

The CT1Z2N15MA is N-Channel Enhancement Mode MOSFET, SOT-23 plastic package.

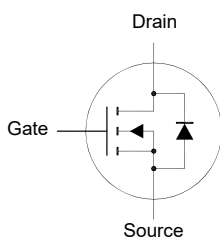
Features

- Extremely low threshold voltage
- Surface-mounted package
- Halogen and Antimony Free(HAF), RoHS compliant

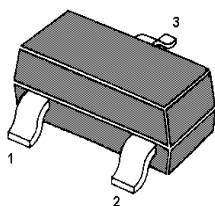
Applications

- Portable appliances
- Battery management

Equivalent Circuit



Pinning



1. Gate 2. Source 3. Drain

SOT-23 Plastic Package

Marking

Model	CT1Z2N15MA
Marking	NX1

Absolute Maximum Ratings(at Ta = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	1	A
Peak Drain Current, Pulsed ¹⁾	I_{DM}	4	A
Total Power Dissipation ²⁾	P_{tot}	960	mW
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to + 150	°C

Thermal Characteristics

Parameter	Symbol	Max.	Unit
Thermal Resistance from Junction to Ambient ²⁾	$R_{\theta JA}$	130	°C/W

¹⁾ Pulse Test: Pulse Width $\leq 100 \mu s$, Duty Cycle $\leq 2\%$, Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ C$.

²⁾ Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air, $t \leq 10 s$.

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
STATIC PARAMETERS					
Drain-Source Breakdown Voltage at $I_D = 250 \mu A$	$V_{(BR)DSS}$	150	-	-	V
Drain-Source On-State Current at $V_{DS} = 120 V$	I_{DSS}	-	-	1	μA
Gate-Source Leakage Current at $V_{GS} = \pm 20 V$	I_{GSS}	-	-	± 100	nA
Gate-Source Threshold Voltage at $V_{DS} = V_{GS}$, $I_D = 250 \mu A$	$V_{GS(th)}$	1	-	3	V
Drain-Source On-State Resistance at $V_{GS} = 10 V$, $I_D = 1 A$ at $V_{GS} = 4.5 V$, $I_D = 1 A$	$R_{DS(on)}$	- -	- -	1.2 1.5	Ω
DYNAMIC PARAMETERS					
Input Capacitance at $V_{GS} = 0 V$, $V_{DS} = 75 V$, $f = 1 MHz$	C_{iss}	-	164	-	pF
Output Capacitance at $V_{GS} = 0 V$, $V_{DS} = 75 V$, $f = 1 MHz$	C_{oss}	-	17	-	pF
Reverse Transfer Capacitance at $V_{GS} = 0 V$, $V_{DS} = 75 V$, $f = 1 MHz$	C_{rss}	-	5.3	-	pF
Gate charge total at $V_{DS} = 75 V$, $V_{GS} = 10 V$, $I_D = 1 A$ at $V_{DS} = 75 V$, $V_{GS} = 4.5 V$, $I_D = 1 A$	Q_g	- -	3.8 1.7	- -	nC
Gate Source Charge at $V_{DS} = 75 V$, $V_{GS} = 10 V$, $I_D = 1 A$	Q_{gs}	-	1.4	-	nC
Gate Drain Charge at $V_{DS} = 75 V$, $V_{GS} = 10 V$, $I_D = 1 A$	Q_{gd}	-	0.2	-	nC
Turn-On Delay Time at $V_{DS} = 75 V$, $V_{GS} = 10 V$, $I_D = 1 A$, $R_g = 3.9 \Omega$	$t_{d(on)}$	-	3.3	-	nS
Turn-On Rise Time at $V_{DS} = 75 V$, $V_{GS} = 10 V$, $I_D = 1 A$, $R_g = 3.9 \Omega$	t_r	-	2.8	-	nS
Turn-Off Delay Time at $V_{DS} = 75 V$, $V_{GS} = 10 V$, $I_D = 1 A$, $R_g = 3.9 \Omega$	$t_{d(off)}$	-	7.7	-	nS
Turn-Off Fall Time at $V_{DS} = 75 V$, $V_{GS} = 10 V$, $I_D = 1 A$, $R_g = 3.9 \Omega$	t_f	-	27	-	nS

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Body-Diode PARAMETERS					
Drain-Source Diode Forward Voltage at $I_S = 1\text{ A}$, $V_{GS} = 0\text{ V}$	V_{SD}	-	-	1.3	V
Body-Diode Continuous Current	I_S	-	-	1	A
Body Diode Reverse Recovery Time at $I_S = 1\text{ A}$, $di/dt = 100\text{ A} / \mu\text{s}$	t_{rr}	-	29	-	nS
Body Diode Reverse Recovery Charge at $I_S = 1\text{ A}$, $di/dt = 100\text{ A} / \mu\text{s}$	Q_{rr}	-	35	-	nC

Electrical Characteristic Curve

Fig. 1 Typical Output Characteristics

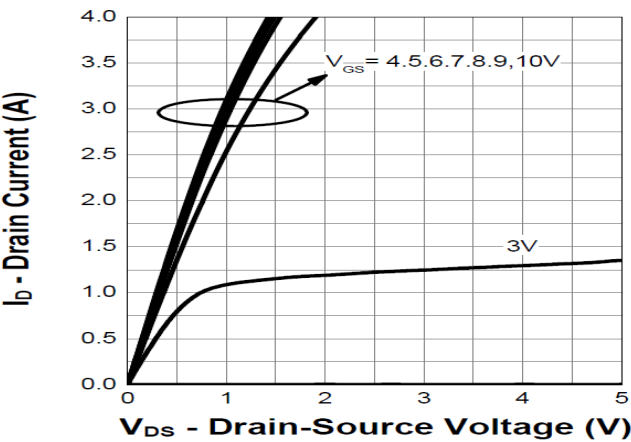


Fig. 2 Gate Threshold Variation vs. T_j

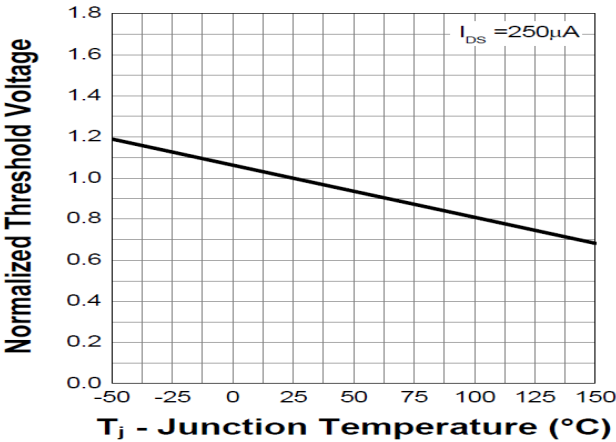


Fig. 3 On-Resistance vs. Gate to Source Voltage

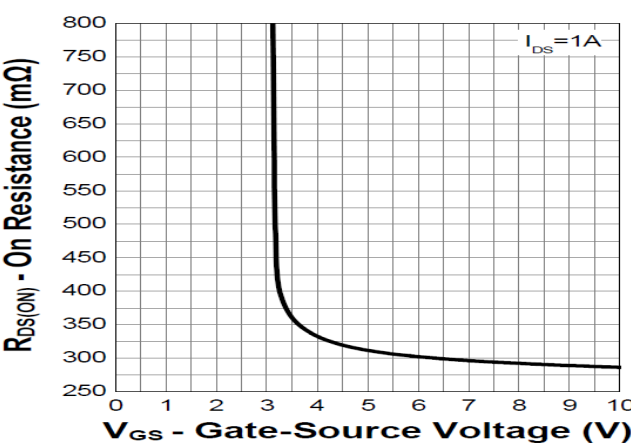


Fig. 4 On-Resistance vs. T_j

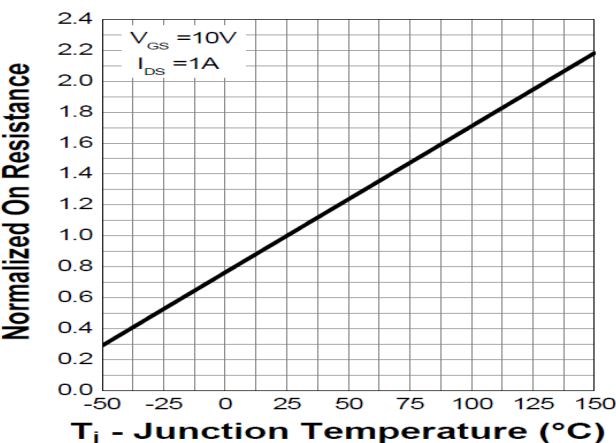


Fig. 5 On-Resistance vs. Drain Current

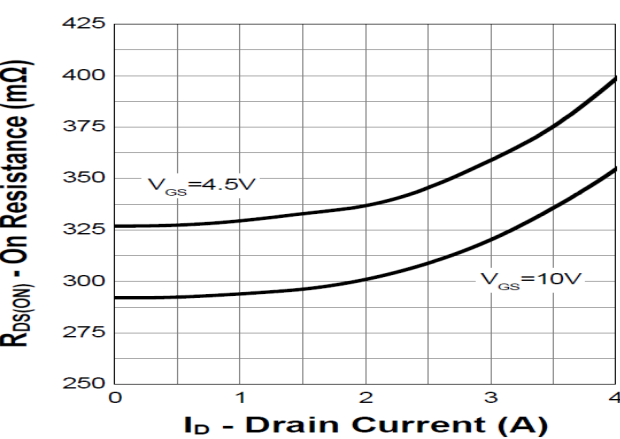
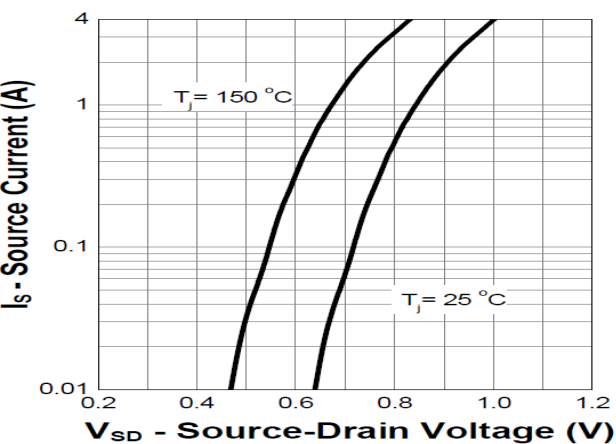


Fig. 6 Typical Forward Characteristics



Electrical Characteristic Curve

Fig. 7 Typical Junction Capacitance

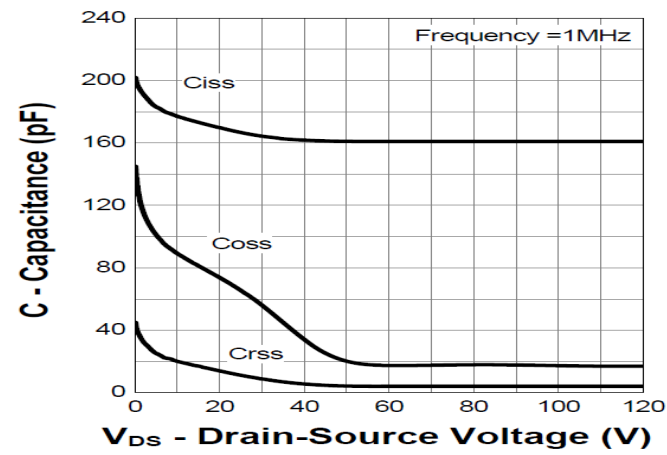
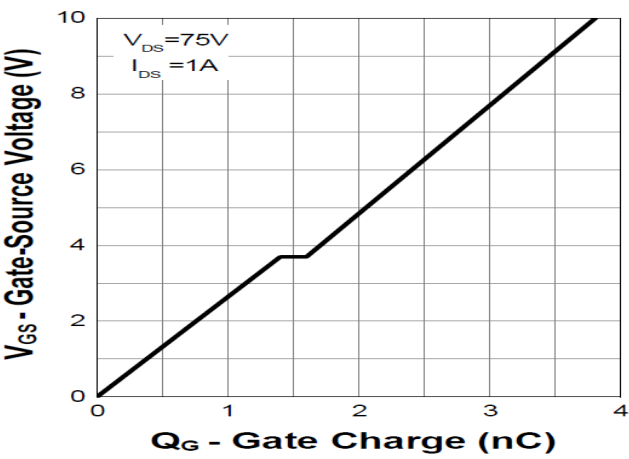
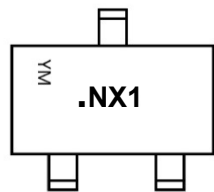


Fig. 8 Gate Charge



Marking instructions

" NX1 " = Part No.
" • " = HAF (Halogen and Antimony Free)
" YM " = Date Code Marking
" Y " = Year
" M " = Month
Font type: Arial



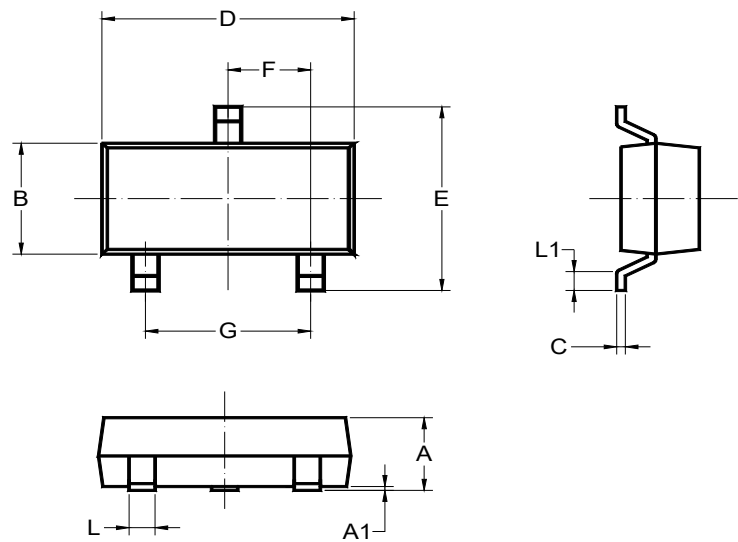
Packaging SPEC.

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-23	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

Package Outline Dimensions

Package Outline (Dimensions in mm)

SOT-23



Unit	A	A1	B	C	D	E	F	G	L	L1
mm	1.20 0.89	0.100 0.013	1.40 1.20	0.19 0.08	3.04 2.80	2.6 2.2	1.02 0.89	2.04 1.78	0.51 0.37	0.2 MIN

Recommended Soldering Footprint

