



N-Channel Enhancement Mode Power MOSFET **MX0215A**



DESCRIPTION

The MX0215A 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

- $V_{DS}=150V$, $I_D=1.1A$
 $R_{DS(ON)}(Typ.)=295m\Omega$ @ $V_{GS}=10V$
 $R_{DS(ON)}(Typ.)=335m\Omega$ @ $V_{GS}=4.5V$
- Surface-mounted package
- Extremely low threshold voltage
- Advanced trench cell design

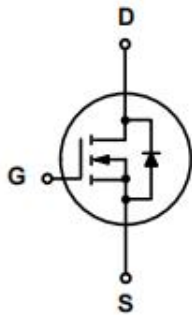


APPLICATION

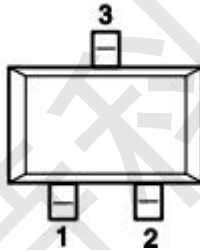
- Portable appliances
- Battery management
- High speed switch



PINOUT



Schematic diagram



SOT23-3L top view

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



ORDERING INFORMATION

Part Number	Storage Temperature	Package	Devices Per Reel
MX0215A	-55°C to 150°C	SOT23-3L	3000



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 25	V
Drain Current($V_{GS}=10V$)(Note1)	I_D	1.1	A
Drain Current($V_{GS}=10V, T_A=100^\circ C$)(Note1)	I_D	0.7	A
Pulsed Drain Current($V_{GS}=10V$)(Note1)(Note2)	I_{DM}	4	A
Continuous-Source Current	I_S	1.1	A
Total Power Dissipation	P_{tot}	0.96	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ C$
Thermal Resistance, Junction-to-Ambient(Note1)	$R_{\theta JA}$	130	$^\circ C/W$

Note 1. Surface Mounted on 1 in² pad area, $t \leq 10$ sec

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



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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	150	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =120V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _{DS} =250μA	1	-	3	V
On-State Resistance ^(Note1)	R _{DS(ON)}	V _{GS} =10V, I _{DS} =1A	-	295	330	mΩ
		V _{GS} =4.5V, I _{DS} =0.5A	-	335	400	mΩ
Dynamic Characteristics ^(Note2)						
Input Capacitance	C _{iss}	V _{DS} =75V, V _{GS} =0V, F=1.0MHz	-	164	-	pF
Output Capacitance	C _{oss}		-	17	-	pF
Reverse Transfer Capacitance	C _{rss}		-	5.3	-	pF
Switching Characteristics ^(Note2)						
Turn-on Delay Time	t _{d(on)}	V _{DS} =75V, I _{DS} =1A, V _{GEN} =10V, R _G =3.9Ω, R _L =75Ω,	-	3.3	-	nS
Turn-on Rise Time	t _r		-	2.8	-	nS
Turn-Off Delay Time	t _{d(off)}		-	7.7	-	nS
Turn-Off Fall Time	t _f		-	27	-	nS
Total Gate Charge	Q _g	V _{DS} =75V, I _{DS} =1A, V _{GS} =10V	-	3.8	-	nC
Gate-Source Charge	Q _{gs}		-	1.4	-	nC
Gate-Drain Charge	Q _{gd}		-	0.2	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage ^(Note1)	V _{SD}	V _{GS} =0V, I _{SD} =1A	-	-	1.3	V
Reverse Recovery Time	t _{rr}	I _{SD} =1A	-	29	-	nS
Reverse Recovery Charge	Q _{rr}	dl _{SD} /dt=100A/μs	-	35	-	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

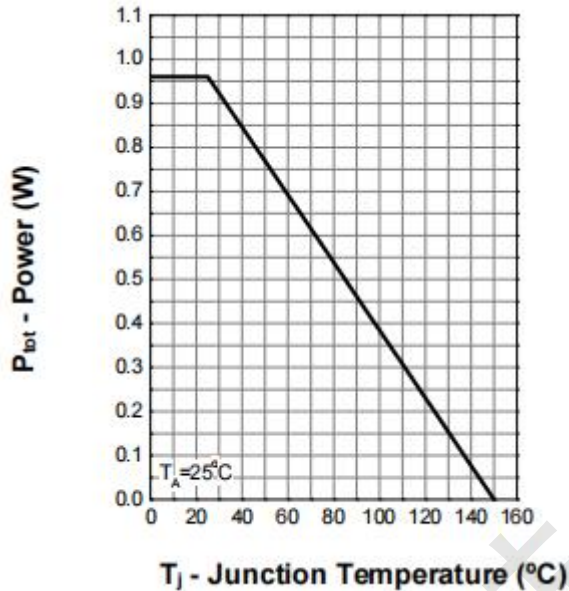


Figure 2. Current Capability

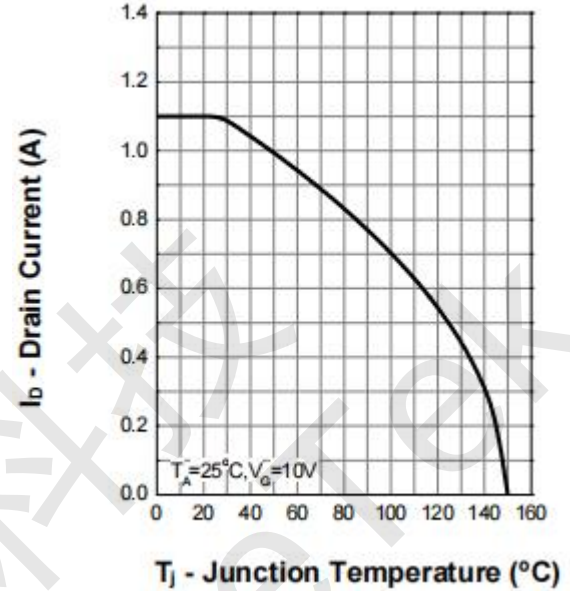


Figure 3. Safe Operating Area

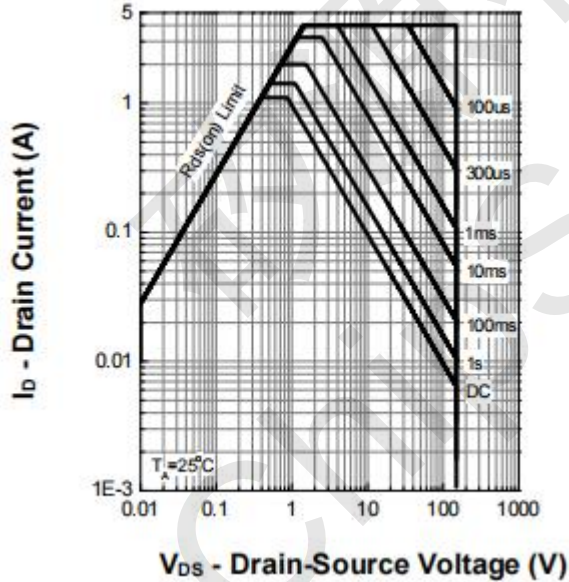
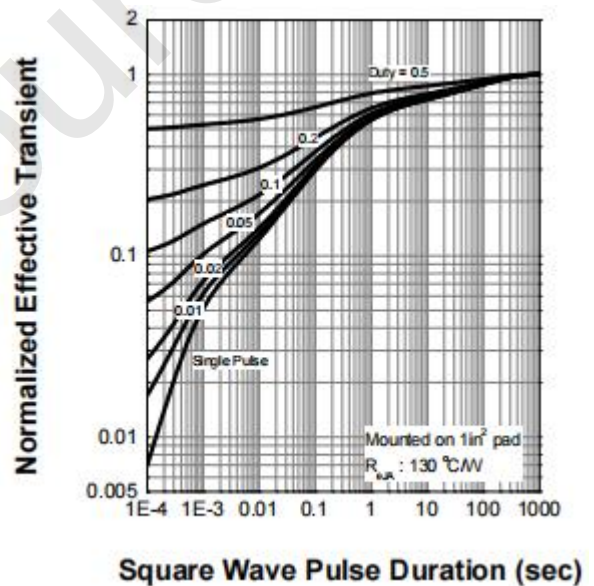


Figure 4. Transient Thermal Impedance





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 5. Output Characteristics

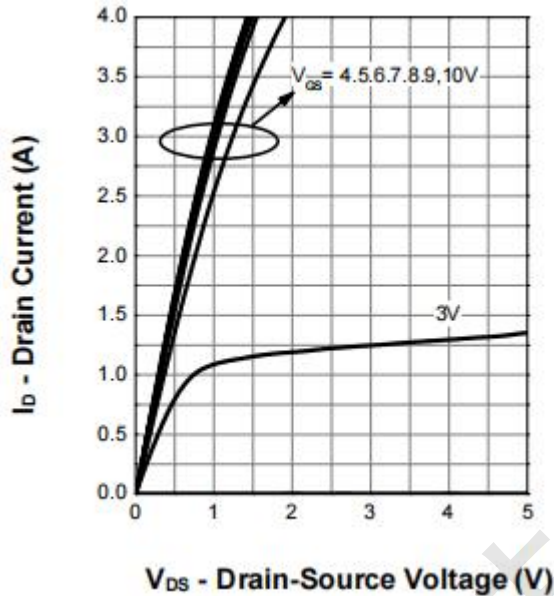


Figure 6. On Resistance

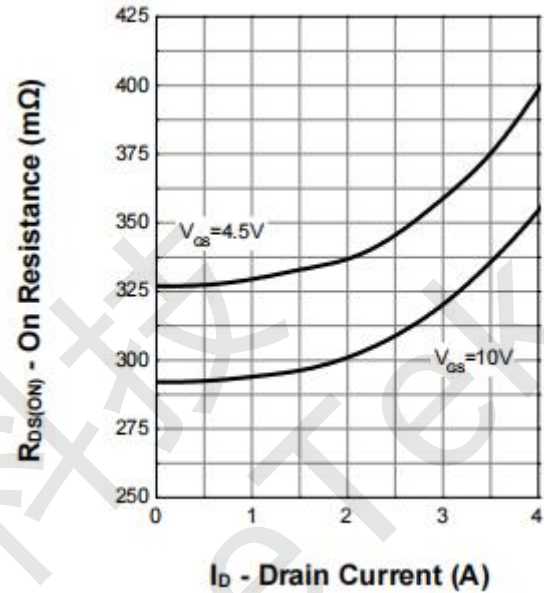


Figure 7. Transfer Characteristics

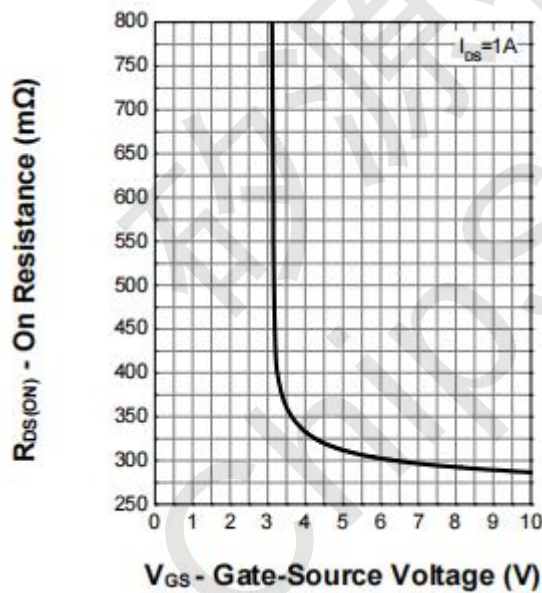
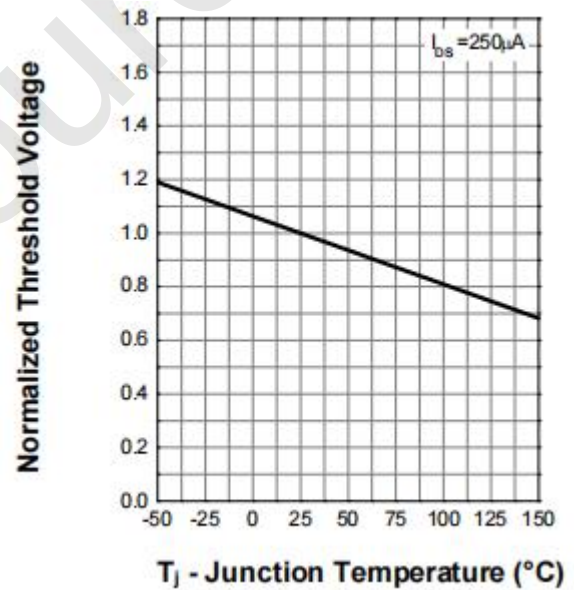


Figure 8. Normalized Threshold Voltage





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 9. Normalized On Resistance

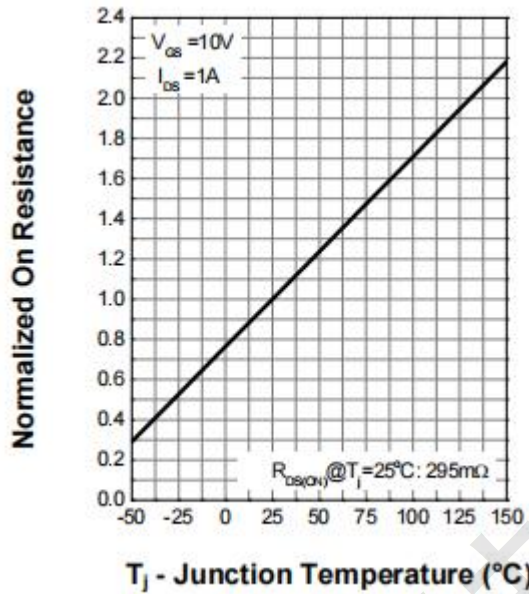


Figure 10. Diode Forward Current

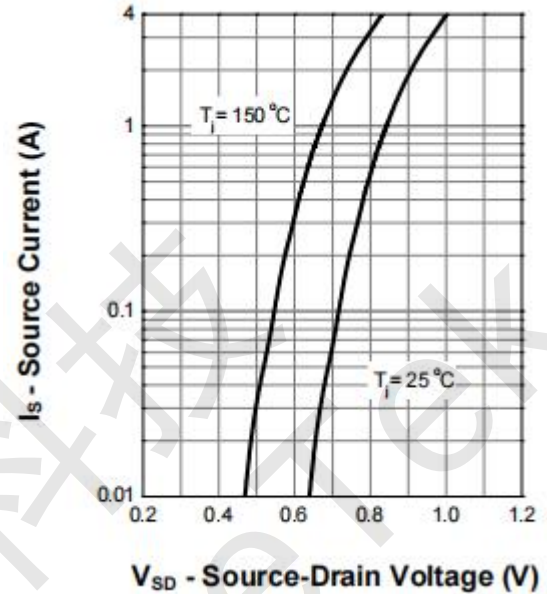


Figure 11. Capacitance

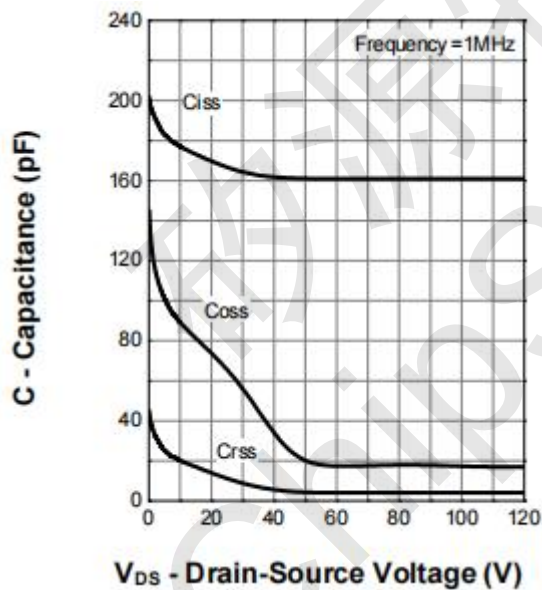
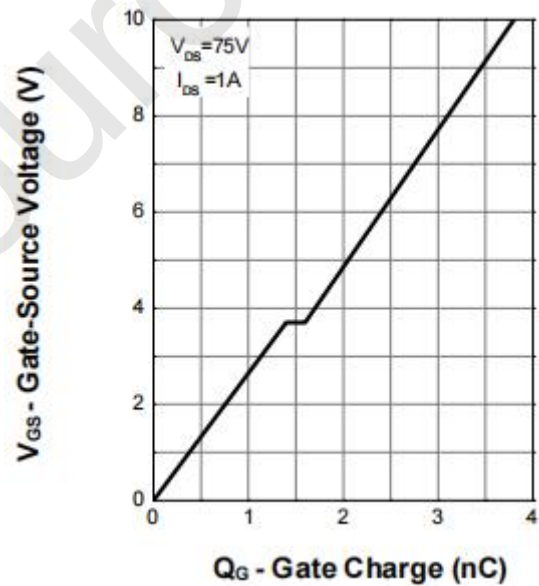


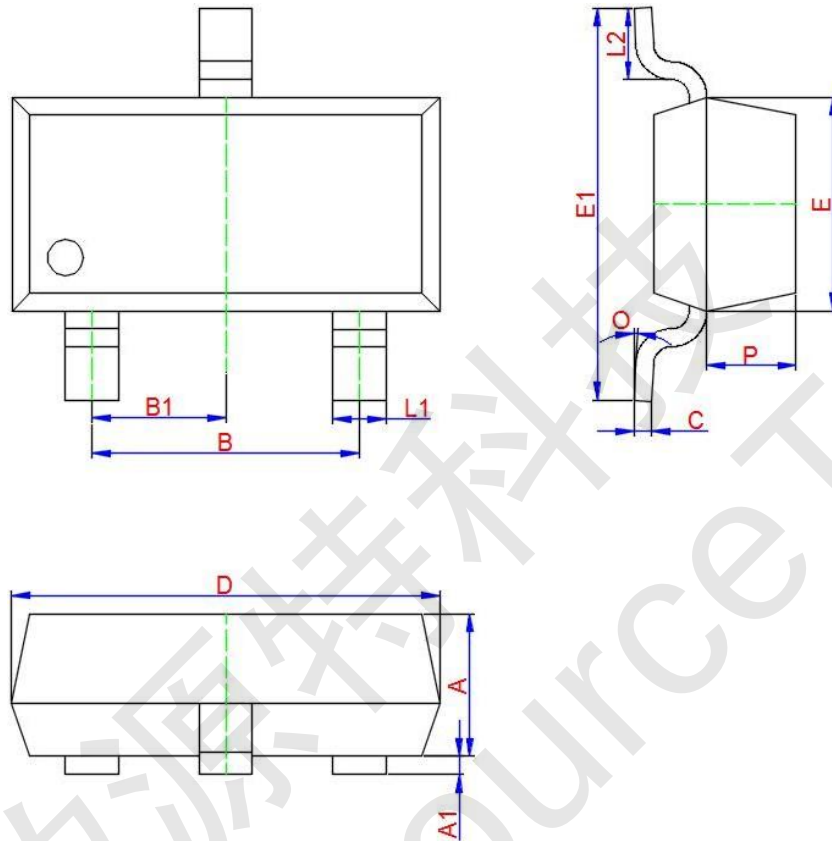
Figure 12. Gate Charge





PACKAGE INFORMATION

SOT23-3L



Symbol	Dimensions in Millimeters		
	Min	Typ.	Max
A	0.900	1.000	1.100
A1	0.000	0.050	0.100
L1	0.300	0.400	0.500
C	0.100	0.110	0.120
D	2.800	2.900	3.000
E	1.250	1.300	1.350
E1	2.250	2.400	2.550
B	1.800	1.900	2.000
B1	0.950 TYP.		
L2	0.200	0.350	0.450
P	0.550	0.575	0.600
O	0°	4°	8°