

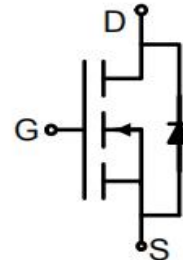


N-Channel Enhancement Mode Power MOSFET

Description

The MX3400A uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 2.5V.

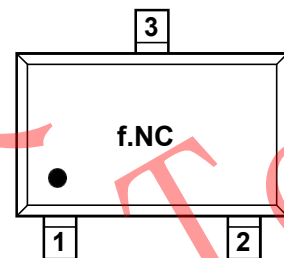
This device is suitable for use as a load switch or in PWM applications.



General Features

- ◆ $V_{DS} = 30V$, $I_D = 5.8A$
- ◆ $R_{DS(ON)}$ (Typ.) $22m\Omega$ @ $V_{GS} = 10V$
- ◆ $R_{DS(ON)}$ (Typ.) $25m\Omega$ @ $V_{GS} = 4.5V$
- ◆ $R_{DS(ON)}$ (Typ.) $30m\Omega$ @ $V_{GS} = 2.5V$
- ◆ High power and current handling capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

Schematic diagram



Application

- ◆ PWM applications
- ◆ Load switch

Marking and pin assignment



SOT-23 (TOP VIEW)

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	V_{DS}	30	V
Gate-source voltage	V_{GS}	± 12	V
Drain current-continuous ^a @ $T_j = 125^\circ C$ -pulse ^b	I_D	5.8	A
	I_{DM}	25	A
Maximum power dissipation	P_D	1.4	W
Operating junction Temperature range	T_j	-55—150	$^\circ C$



Electrical Characteristics (TA=25°C unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	33		V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =30V, V _{GS} =0V			1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±12V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	0.7	0.9	1.4	V
g _{FS}	Forward Transconductance	V _{DS} =5V, I _D =2.9A	10			S
R _{DS(ON)}	Drain-Source On-State Resistance	V _{GS} =10V, I _D =5.5A		22	35	mΩ
		V _{GS} =4.5V, I _D =4.5A		25	40	mΩ
		V _{GS} =2.5V, I _D =4A		30	55	mΩ
Dynamic Characteristics						
C _{iss}	Input Capacitance			623		pF
C _{oss}	Output Capacitance	V _{DS} =15V, V _{GS} =0V, f=1.0MHz		99		pF
C _{rss}	Reverse Transfer Capacitance			77		pF
Switching Times						
t _{d(on)}	Turn-on Delay Time			3.3		nS
t _r	Turn-on Rise Time			4.8		nS
t _{d(off)}	Turn-Off Delay Time	V _{DD} =15V, I _D =2.9A, V _{GS} =10V, R _G =3Ω		26		nS
t _f	Turn-Off Fall Time			4		nS
Q _g	Total Gate Charge			9.5		nC
Q _{gs}	Gate-Source Charge	V _{DS} =15V, I _D =5.8A, V _{GS} =4.5V		1.5		nC
Q _{gd}	Gate-Drain Charge			3		nC
Source-Drain Diode Characteristics						
I _{SD}	Source-Drain Current(Body Diode)				2.9	A
V _{SD}	Forward on Voltag (Note 1)	V _{GS} =0V, I _S =2.9A		0.75	1.2	V

Notes:

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2.surface mounted on FR4 board,t≤10sec
- 3.pulse test: pulse width≤300μs,duty≤2%
- 4.guaranteed by design, not subject to production testing



Typical Performance Characteristics

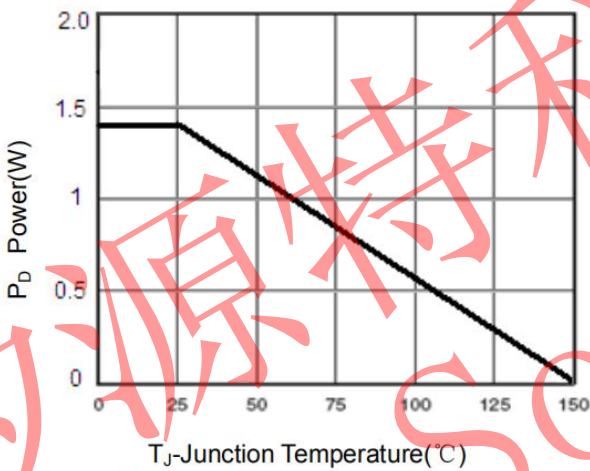
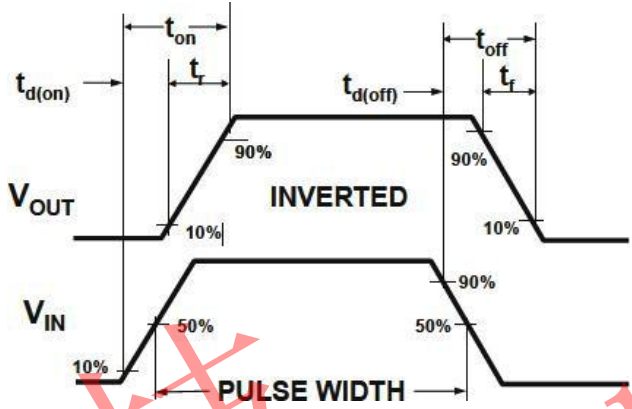
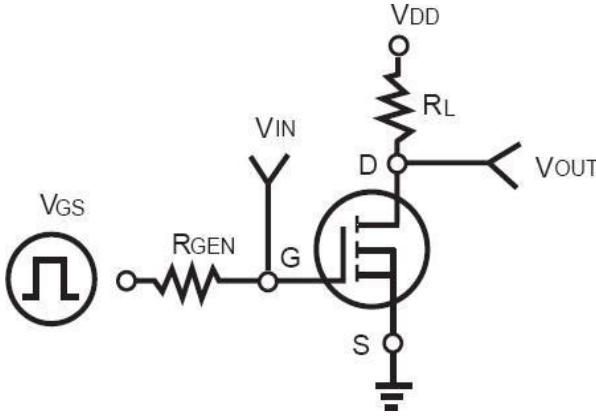


Figure 3 Power Dissipation

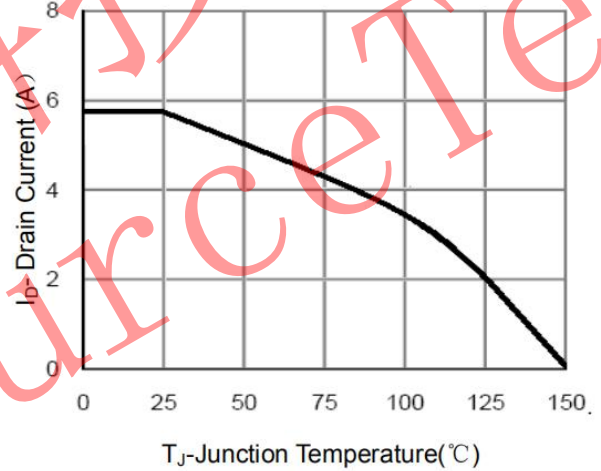


Figure 4 Drain Current

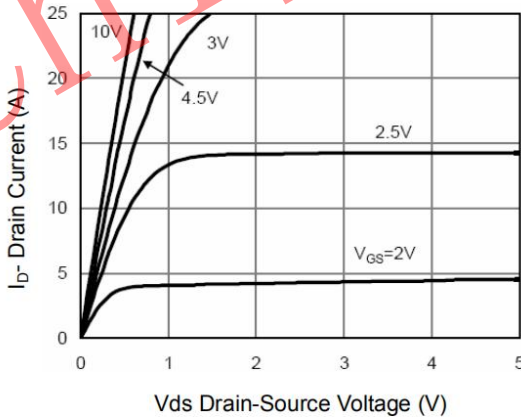


Figure 5 Output Characteristics

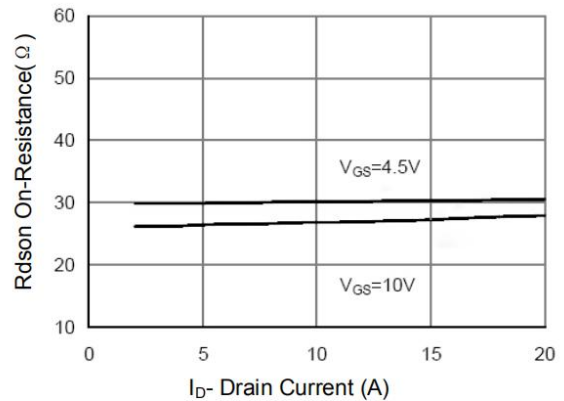


Figure 6 Drain-Source On-Resistance

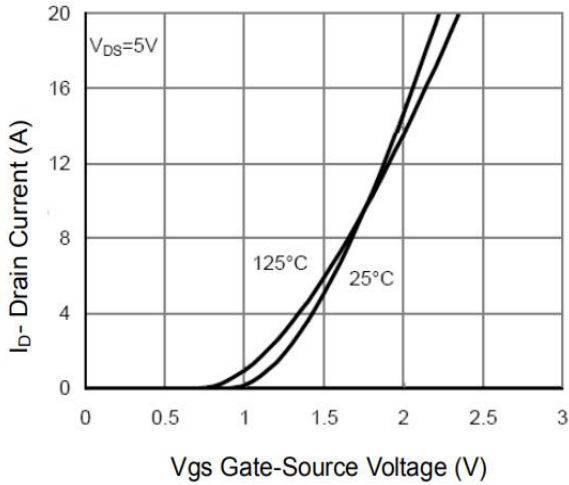


Figure 7 Transfer Characteristics

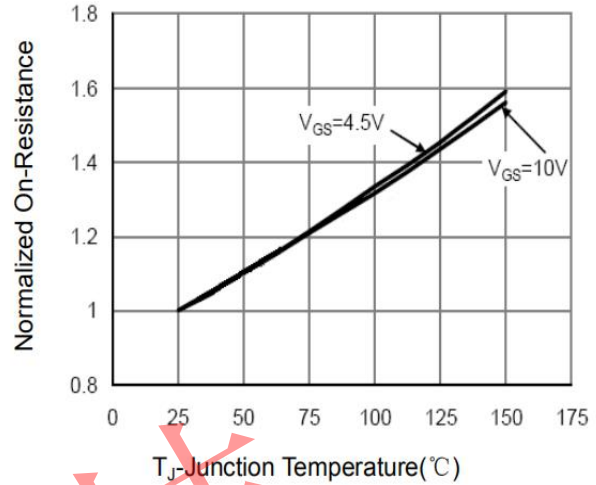


Figure 8 Drain-Source On-Resistance

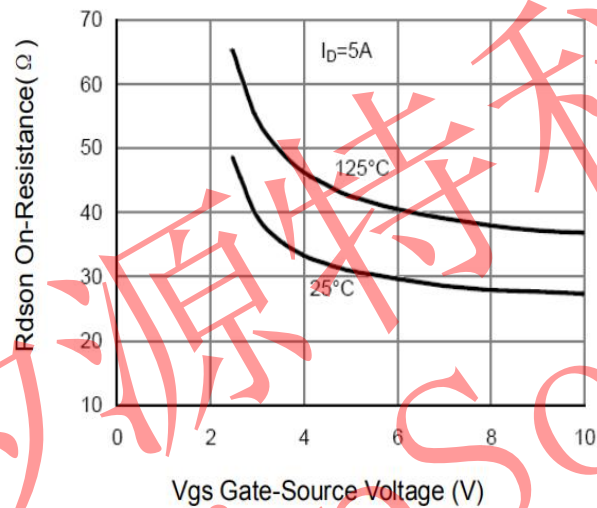


Figure 9 Rdson vs Vgs

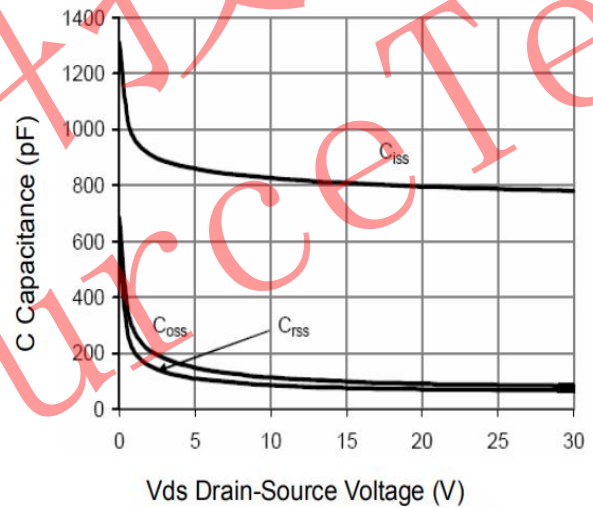


Figure 10 Capacitance vs Vds

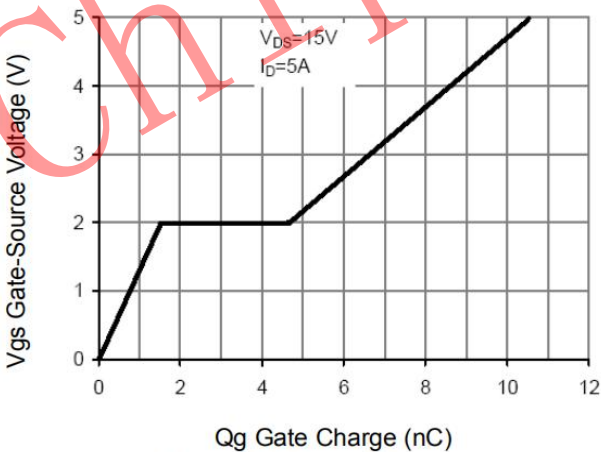


Figure 11 Gate Charge

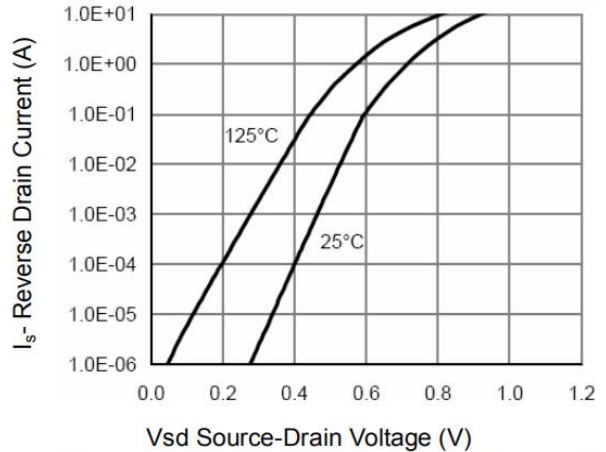


Figure 12 Source- Drain Diode Forward

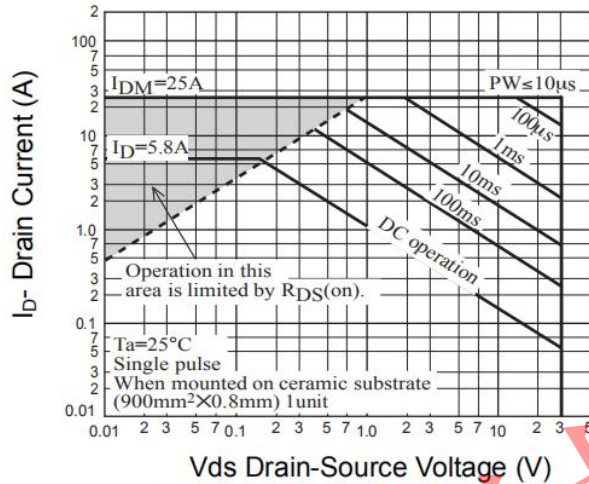


Figure 13 Safe Operation Area

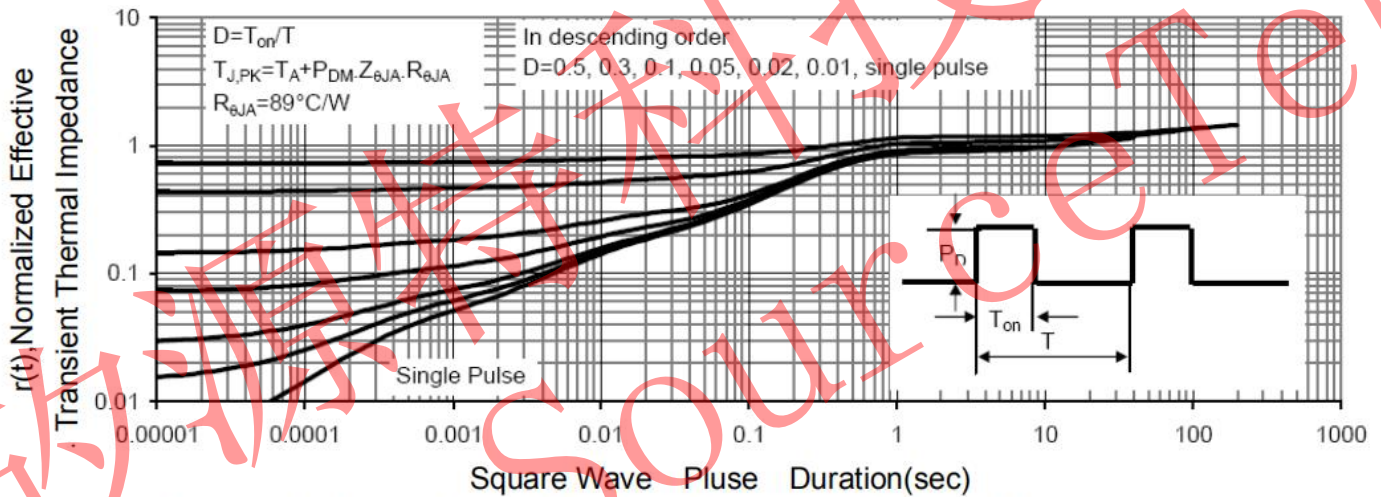
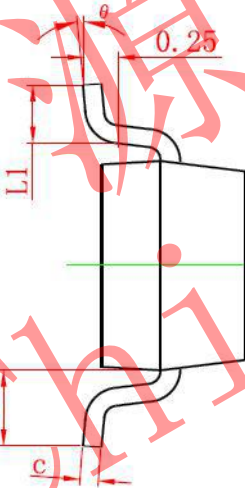
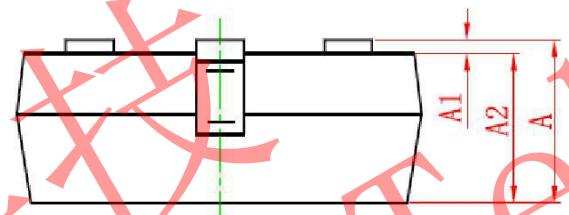
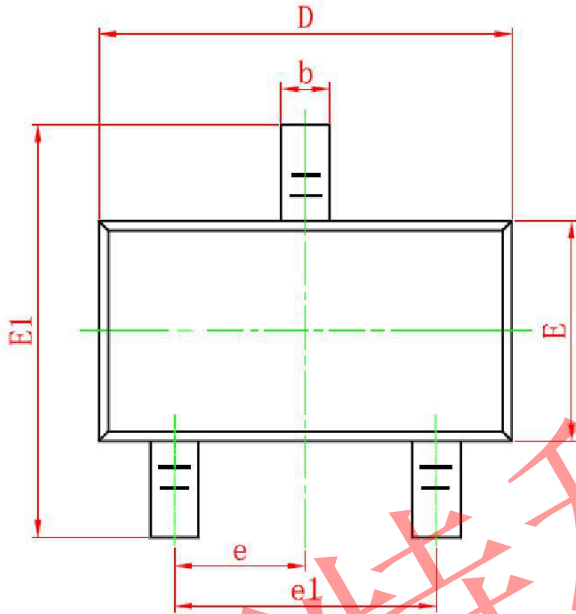


Figure 14 Normalized Maximum Transient Thermal Impedance



SOT-23 PACKAGE INFORMATION

Dimensions in Millimeters (UNIT:mm)



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°