P-Channel Enhancement Mode Power MOSFET **MX2305A**

DESCRIPTION

These miniature surface mount MOSFETs reduce power loss conserve energy, making this device ideal for use in small power management circuitry.

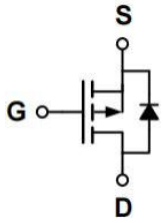
GENERAL FEATURES

- V_{DS}=-20V, I_D=-4.1A
  $R_{DS(ON)}$(Typ.)=30mΩ @ V_{GS}=-4.5V
  $R_{DS(ON)}$(Typ.)=38mΩ @ V_{GS}=-2.5V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

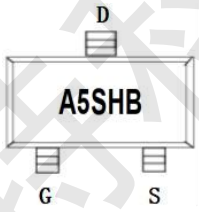
APPLICATION

- PWM applications
- Load switch
- Power management
- Video monitor

PINOUT



Schematic diagram



Marking and pin assignment


SOT-23 top view

ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MX2305A	-55°C to 150°C	SOT-23	-

ABSOLUTE MAXIMUM RATINGS(T_A=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous(T_C=25°C)	I_D	-4.1	A
Drain Current-Continuous(T_C=70°C)	I_D	-2.6	A
Drain Current-Pulsed(Note1)	I_{DM}	-16	A
Power Dissipation(T_C=25°C)	P_D	1.0	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	300	°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	125	°C/W

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

ELECTRICAL CHARACTERISTICS(T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=-250μA	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-20V, V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-0.4	-0.7	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-4.1A	-	30	38	mΩ
		V_{GS}=-2.5V, I_D=-3A	-	38	53	mΩ
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, F=1.0MHz	-	830	-	pF
Output Capacitance	C_{oss}		-	132	-	pF
Reverse Transfer Capacitance	C_{rss}		-	85	-	pF
Gate Resistance	R_g	F=1.0MHz	-	1	-	Ω
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V, I_D=-3.3A, V_{GEN}=-4.5V, R_G=1Ω,	-	10	-	nS
Turn-on Rise Time	t_r		-	32	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	50	-	nS
Turn-Off Fall Time	t_f		-	51	-	nS
Total Gate Charge	Q_g	V_{DS}=-10V, I_D=-2A, V_{GS}=-4.5V	-	8.8	-	nC
Gate-Source Charge	Q_{gs}		-	1.4	-	nC
Gate-Drain Charge	Q_{gd}		-	1.9	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=-4.1A	-	-0.8	-1.2	V

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Output Characteristics

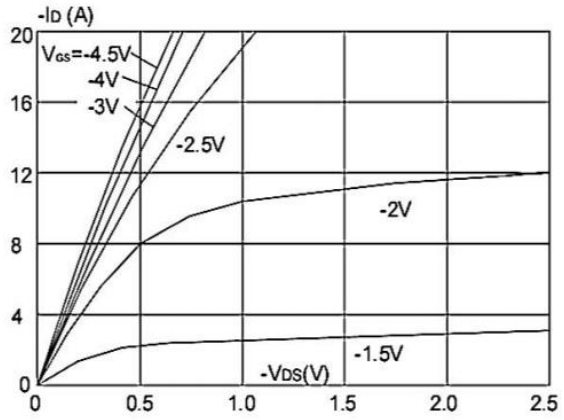


Figure 2. Typical Transfer Characteristics

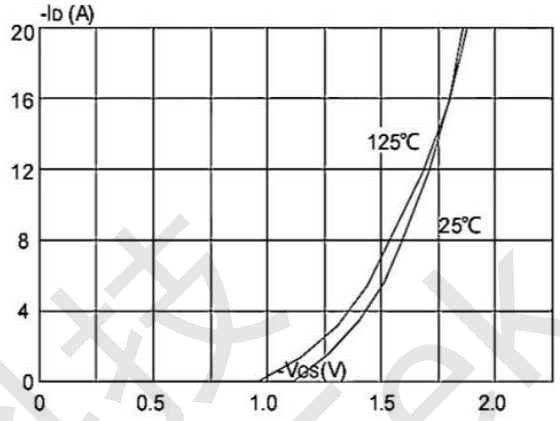


Figure 3. On-resistance vs. Drain Current

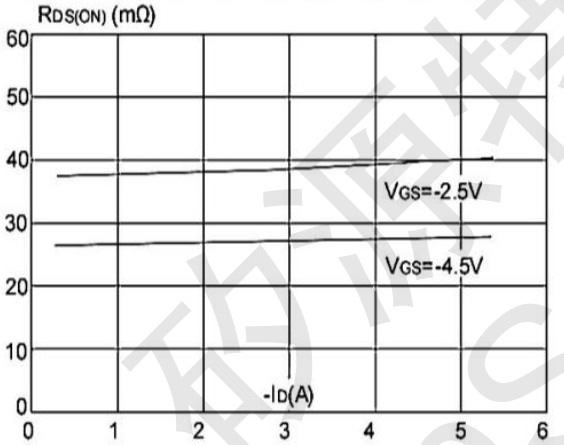


Figure 4. Body Diode Characteristics

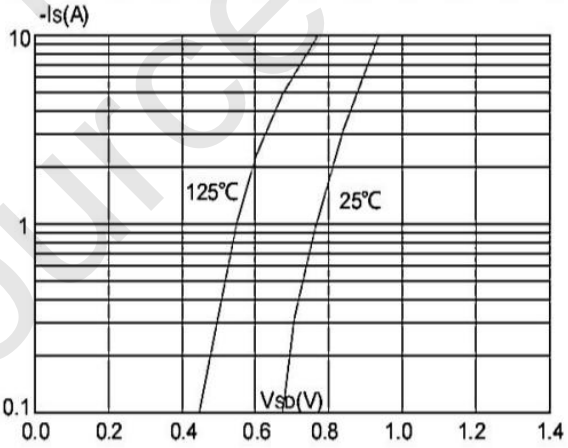


Figure 5: Gate Charge Characteristics

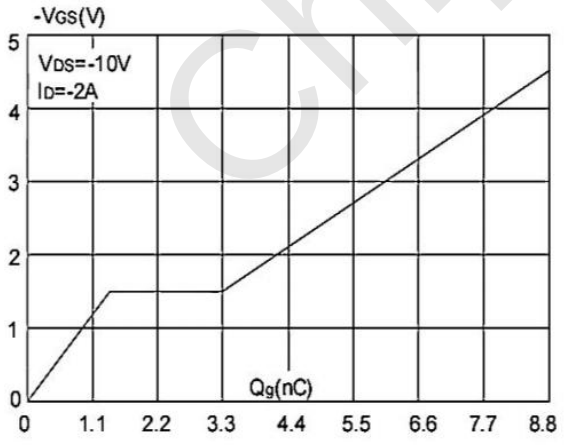
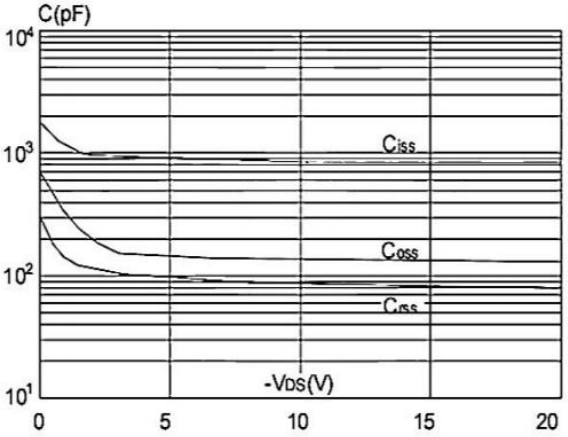


Figure 6: Capacitance Characteristics



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7: Normalized Breakdown Voltage vs Junction Temperature

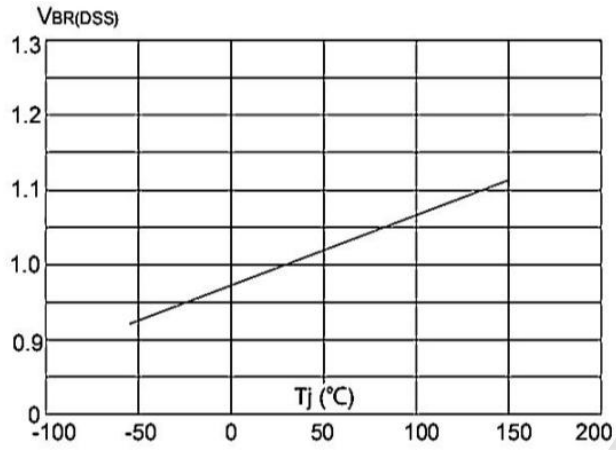


Figure 8: Normalized on Resistance vs Junction Temperature

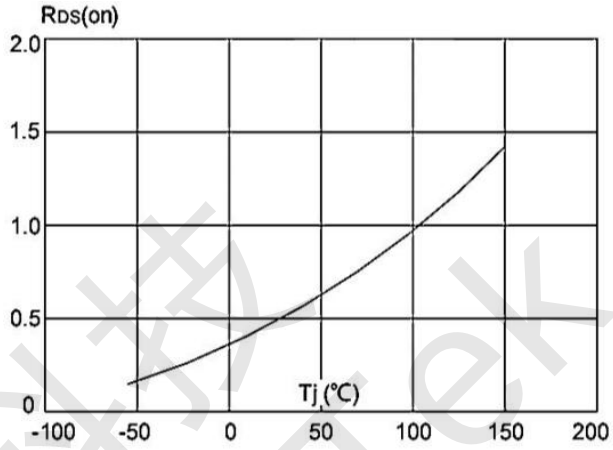


Figure 9: Maximum Safe Operating Area

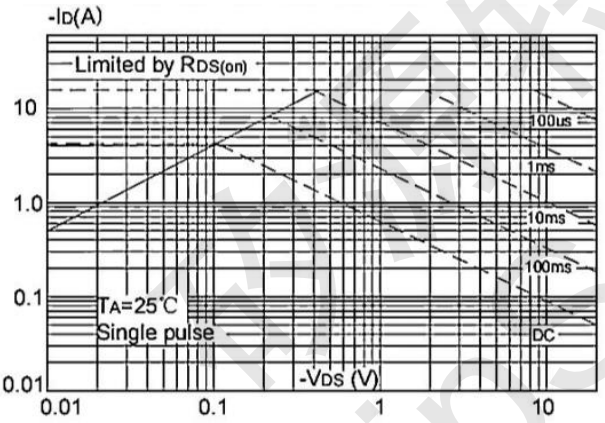


Figure 10: Maximum Continuous Drain Current vs Ambient Temperature

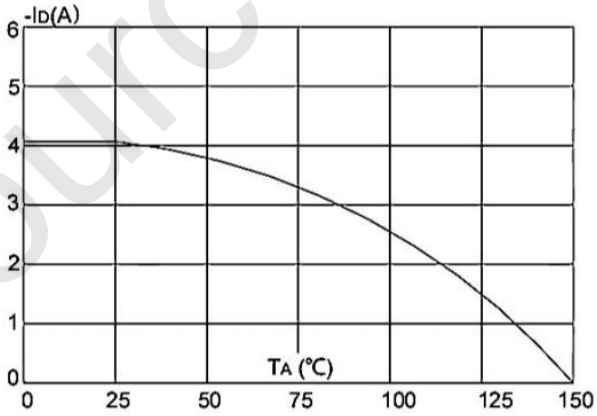
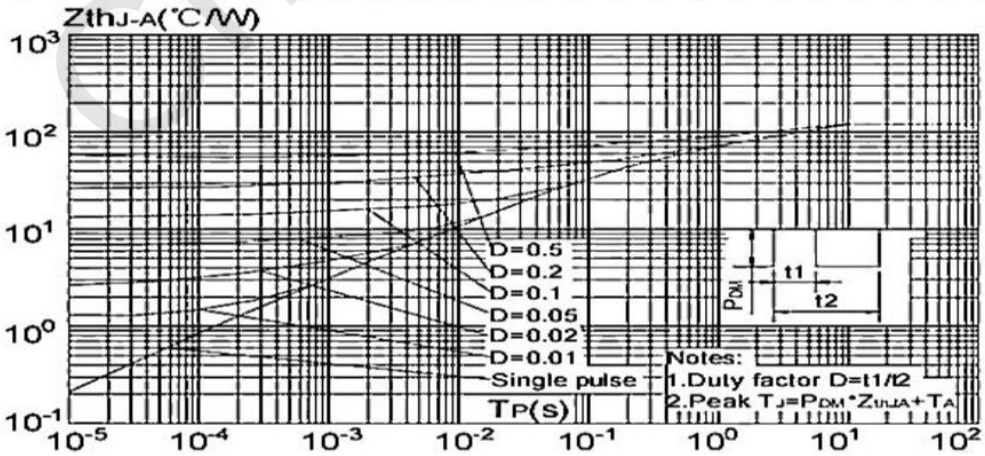
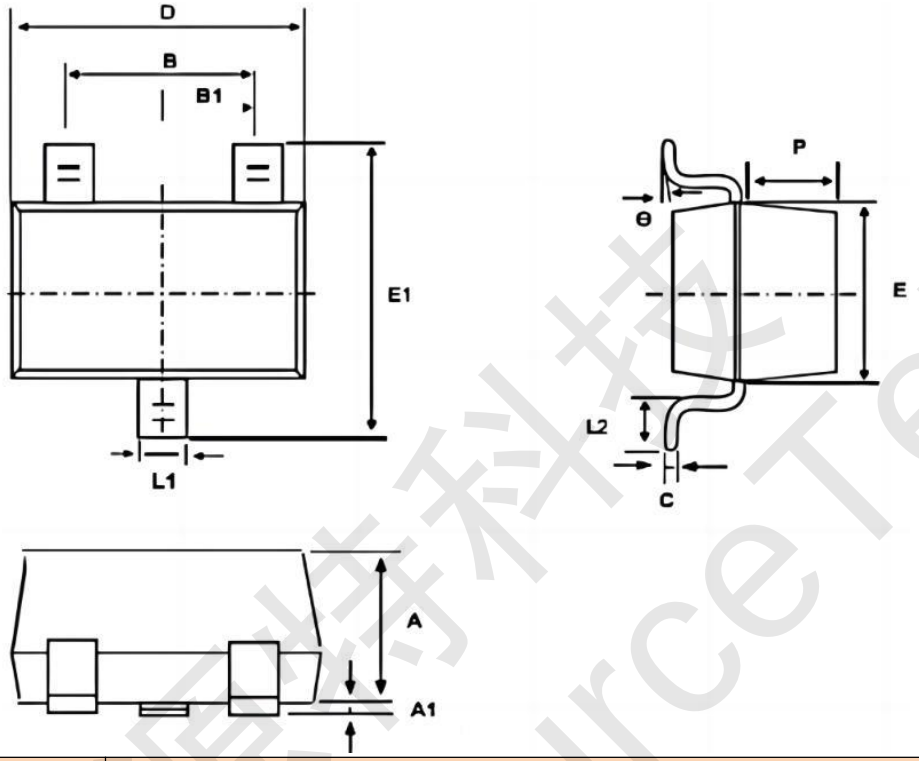


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient



PACKAGE INFORMATION

SOT-23



Symbol	Dimensions In Millimeters		
	MIN.	NOM.	MAX.
A	0.900	1.000	1.100
A1	0.000	0.050	0.100
L1	0.350	0.400	0.500
C	0.100	0.110	0.120
D	2.800	2.900	3.000
E	1.200	1.400	1.600
E1	2.250	2.400	2.550
B	1.800	1.900	2.000
B1	0.950TPY.		
L2	0.200	0.350	0.450
P	0.550	0.575	0.600