

N-Channel Enhancement Mode MOSFET

1 Features

- $V_{DS} = 20V$, $I_D = 3A$
- $R_{DS(ON)} < 75m\Omega$ @ $V_{GS}=4.5V$
- $R_{DS(ON)} < 115m\Omega$ @ $V_{GS}=2.5V$
- High density cell design for extremely low $R_{DS(ON)}$
- Lead free product is acquired
- Conventional SOT-23 Package

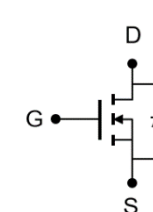
2 Applications

- Cellular Handsets and Accessories
- PWM applications
- Load switch
- Power management

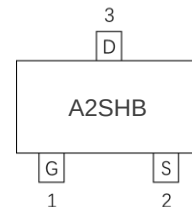
3 Description

The SI2302 provide the best combination of fastswitching, low on-resistance and cost-effectiveness. The MOSFET is the N-Channel enhancement mode power field effect transistors with high cell density, trench technology. This high density process and design have been optimized switching performance and especially tailored to minimize on-state resistance.

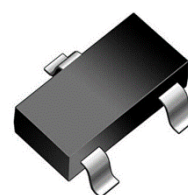
4 Pin Configuration and Marking



Schematic Diagram



Marking (Top View)



SOT-23

5 Device Information

PART NUMBER	PACKAGE	BODY SIZE (NOM)
SI2302	SOT-23	2.90 mm x 2.40mm

6 Absolute maximum Ratings @25°C

RATING	SYMBOL	VALUE	UNITS
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	3	A
Pulsed Drain Current	I_{DP}	12	A
Total power dissipation	P_D	0.8	W
Channel temperature	T_J	-55 to +150	°C
Range of storage temperature	T_{STG}	-55 to +150	°C
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	156	°C/W

7 Electrical characteristics (@25°C unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 250μA, V _{GS} = 0V	20			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	0.45	0.75	1.2	V
Drain Cut Off Current	I _{DSS}	V _{DS} = 20V, V _{GS} = 0V			1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±10V, V _{DS} = 0V			±1	μA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} = 4.5V, I _D = 3A		50	75	mΩ
		V _{GS} = 2.5V, I _D = 2A		70	115	mΩ
Forward Transconductance	g _{FS}	V _{DS} = 10V, I _D = 2A		5		S
Dynamic Characteristics						
Total Gate Charge	Q _G	V _{DS} =10V, I _D =2.8A, V _{GS} = 4.5V		4.5		nC
Gate-Source Charge	Q _{GS}			0.8		nC
Gate-Drain Charge	Q _{GD}			1.2		nC
Input Capacitance	C _{ISS}	V _{DS} = 10V, V _{GS} = 0V, f = 1MHz		456.4		pF
Reverse Transfer Capacitance	C _{RSS}			58.9		pF
Output Capacitance	C _{OSS}			86.8		pF
Turn-On Delay Time	t _{d(on)}	V _{GS} =4.5V, V _{DS} =10V, I _D =1A, R _G =6.0Ω		11.2		ns
Turn-Off Delay Time	t _{d(off)}			19.6		ns
Rise Time	t _r			3.5		ns
Fall Time	t _f			4.4		ns
Drain-Source Body Diode Characteristics						
Source-Drain Diode Forward Voltage	V _{SD}	I _{SD} =3V, V _{GS} =0V		0.8	1.2	V

8 Typical Characteristics

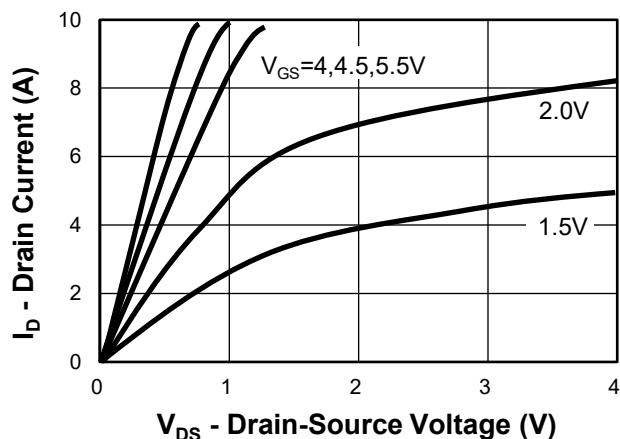


Fig 1. Output Characteristics

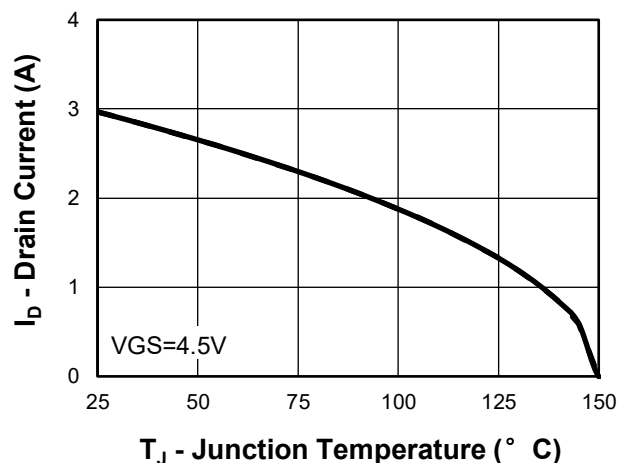


Fig 2. Drain Current

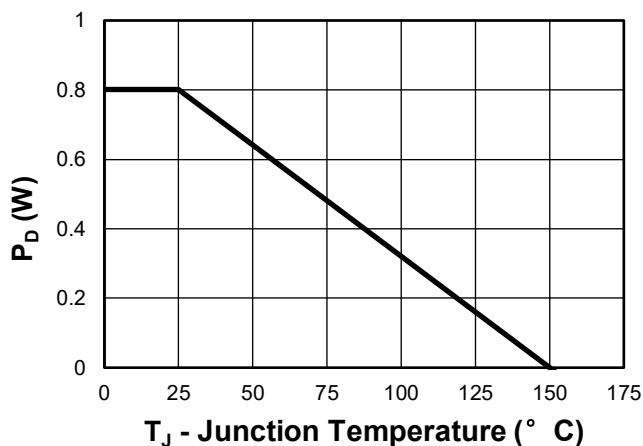


Fig 3. Power Dissipation

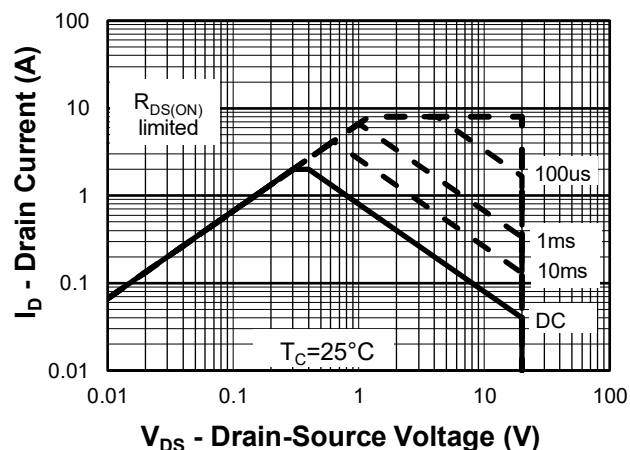


Fig 4. Safe Operation Area(SOA)

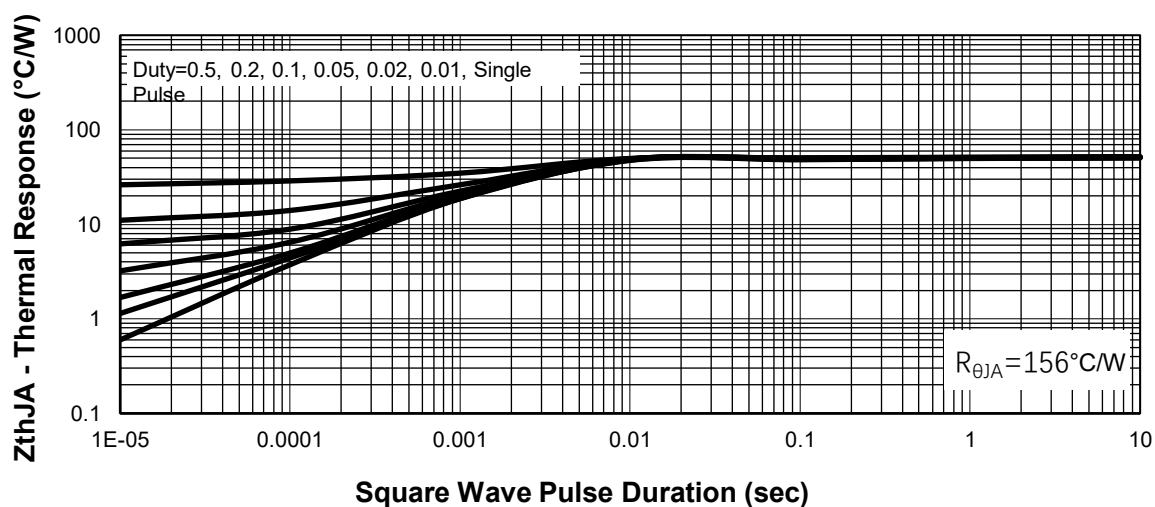


Fig 5. Thermal Transient Impedance

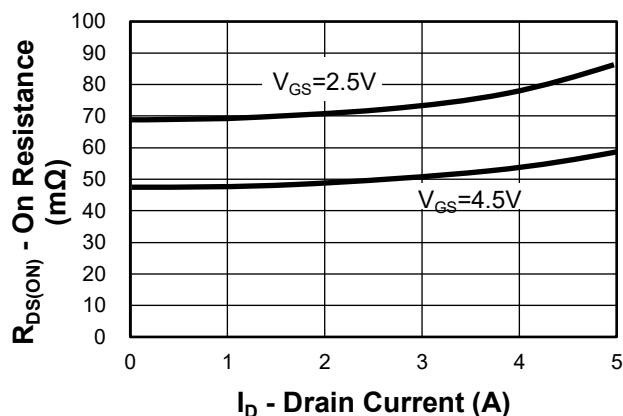


Fig 6. Rdson vs. Drain Current Characteristics

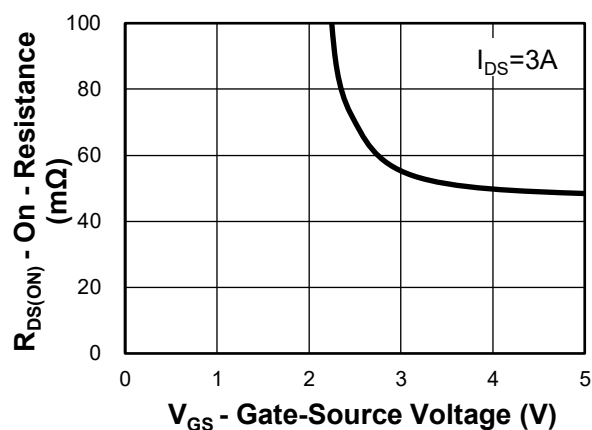


Fig 7. Gate-Source on Resistance

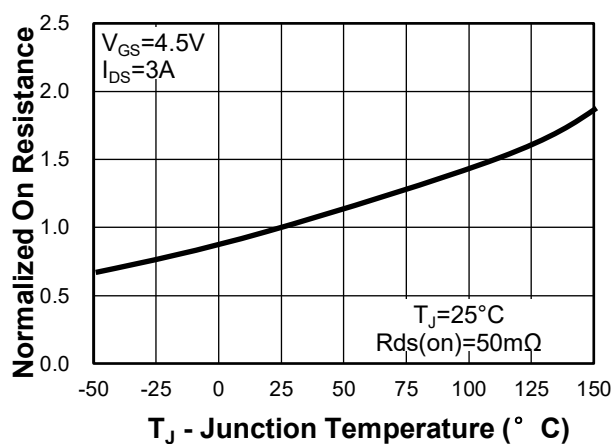


Fig 8. Rdson vs. Junction Tem Characteristics

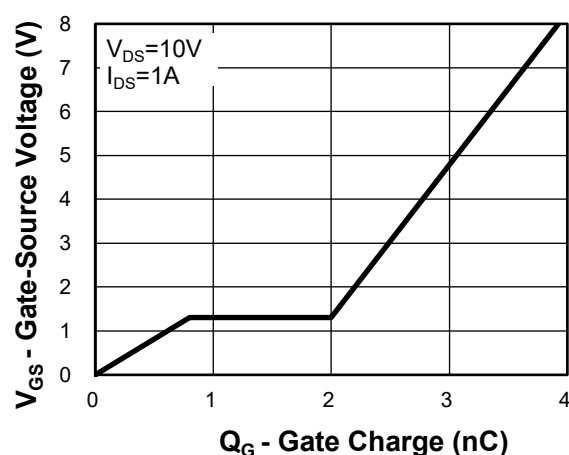


Fig 9. Gate Charge Characteristics

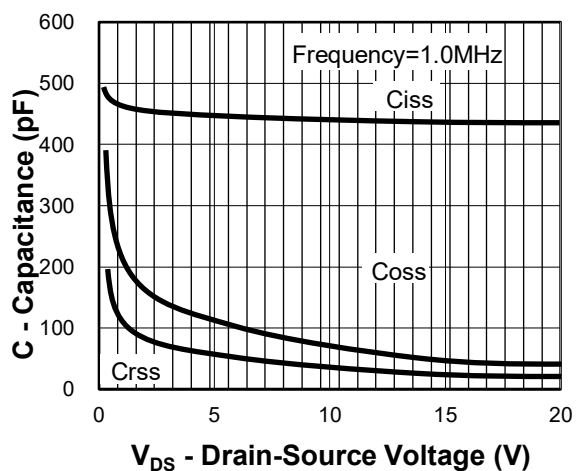


Fig 10. Capacitance Characteristics

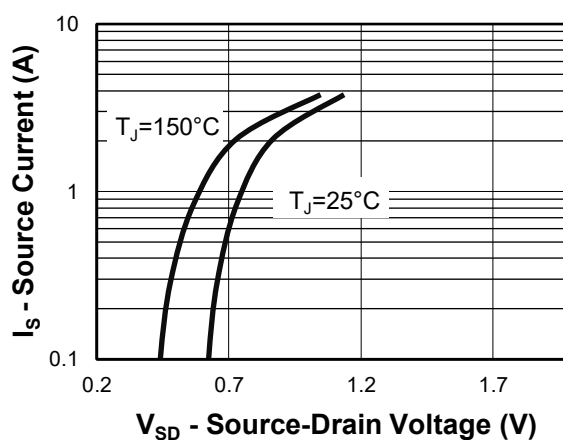
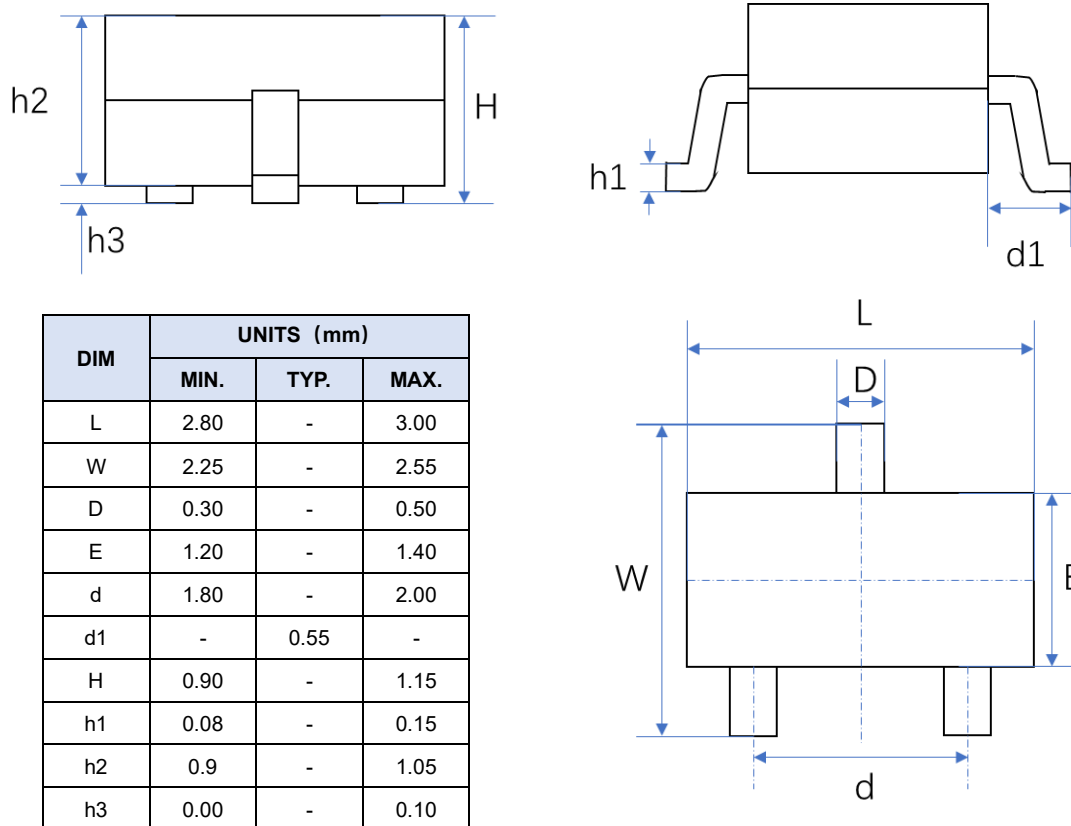


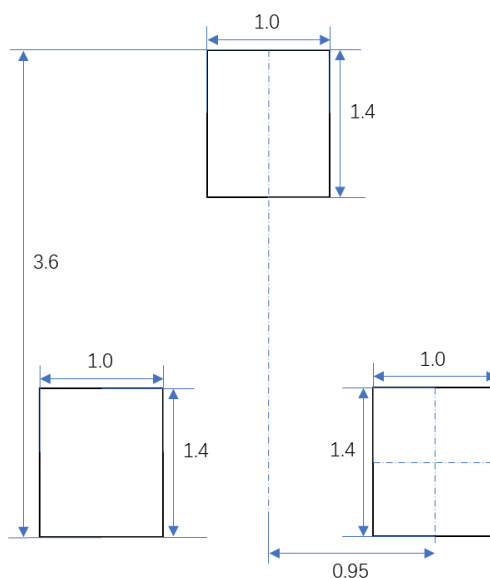
Fig 11. Source-Drain Diode Forward

9 Product dimension

SOT-23



10 PCB Layout Footprints (Units: mm)



11 Ordering Information

Part Number	Packaging	Reel Size
SI2302	3000/Tape & Reel	7 inch