

ATM2301PSC

P-Channel Enhancement Mode Field Effect Transistor

Drain-Source Voltage: -20V

Drain Current: -3A

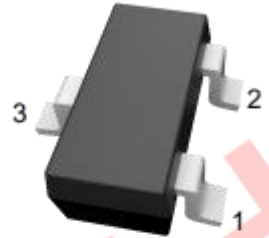
Features

- Trench FET Power MOSFET
- Excellent $R_{DS(on)}$ and Low Gate Charge
- $R_{DS(ON)} < 110m\Omega$ ($V_{GS} = -4.5V$)
- $R_{DS(ON)} < 130m\Omega$ ($V_{GS} = -2.5V$)

Application

- DC/DC Converter
- Load Switch for Portable Devices
- Battery Switch

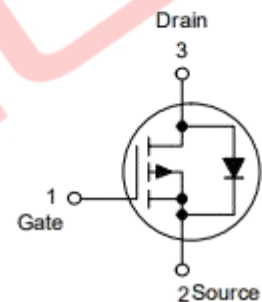
SOT-23-3



1. Gate 2. Source 3. Drain

Marking: M01

Schematic Diagram



Absolute maximum ratings (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	-3	A
Pulsed Drain Current	I_{DM}	-10	A
Power Dissipation	P_D	1	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	125	$^{\circ}C/W$
Junction Temperature	T_J	150	$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}C$

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Electrical characteristics (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -16V, V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±12V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.4	-0.75	-0.9	V
Drain-source on-resistance ¹⁾	R _{DS(on)}	V _{GS} = -4.5V, I _D = -3A		90	110	mΩ
		V _{GS} = -2.5V, I _D = -2A		110	130	
Forward transconductance ¹⁾	g _{FS}	V _{DS} = -5V, I _D = -3A	5			S
Dynamic characteristics²⁾						
Input Capacitance	C _{iss}	V _{DS} = -10V, V _{GS} = 0V, f = 1MHz		405		pF
Output Capacitance	C _{oss}			75		
Reverse Transfer Capacitance	C _{rss}			55		
Gate resistance	R _g	f = 1MHz		6		Ω
Total Gate Charge	Q _g	V _{DS} = -10V, V _{GS} = -2.5V, I _D = -3A		3.3	12	nC
Gate-Source Charge	Q _{gs}			0.7		
Gate-Drain Charge	Q _{gd}			1.3		
Turn-on delay time	t _{d(on)}	V _{DD} = -10V, V _{GEN} = -4.5V, I _D = -1A R _L = 10Ω, R _{GEN} = 1Ω		11		ns
Turn-on rise time	t _r			35		
Turn-off delay time	t _{d(off)}			30		
Turn-off fall time	t _f			10		
Source-Drain Diode characteristics						
Diode Forward voltage	V _{DS}	V _{GS} = 0V, I _S = -1A			-1	V

Notes:

- 1) Pulse Test: Pulse Width < 300μs, Duty Cycle ≤2%.
- 2) Guaranteed by design, not subject to production testing.

Typical Characteristics Curves

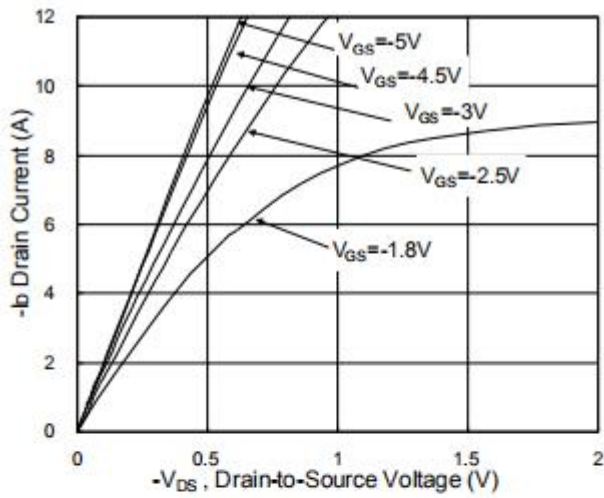


Fig.1 Typical Output Characteristics

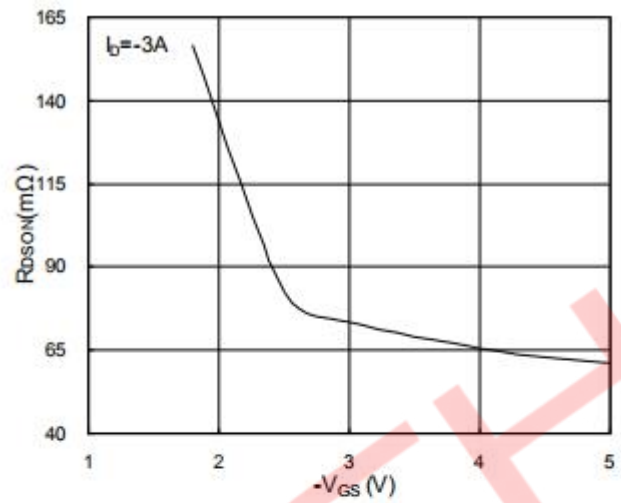


Fig.2 On-Resistance vs. Gate-Source Voltage

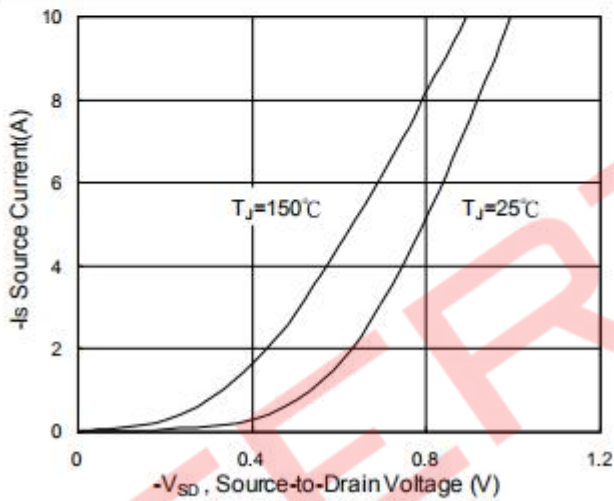


Fig.3 Forward Characteristics of Reverse

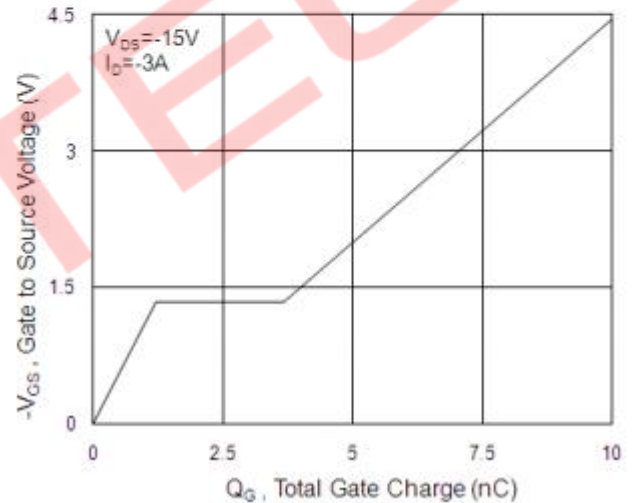


Fig.4 Gate-Charge Characteristics

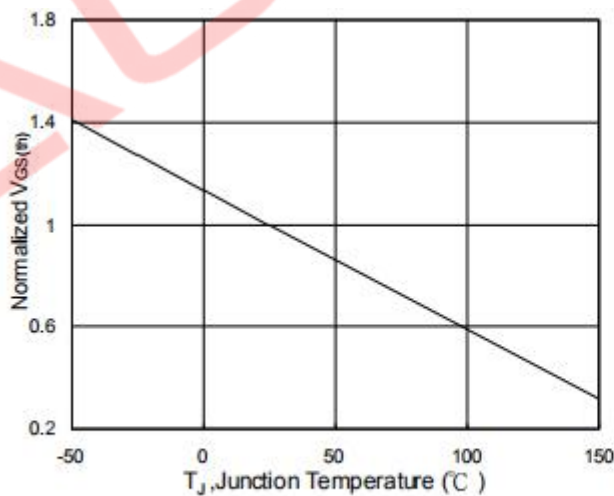


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

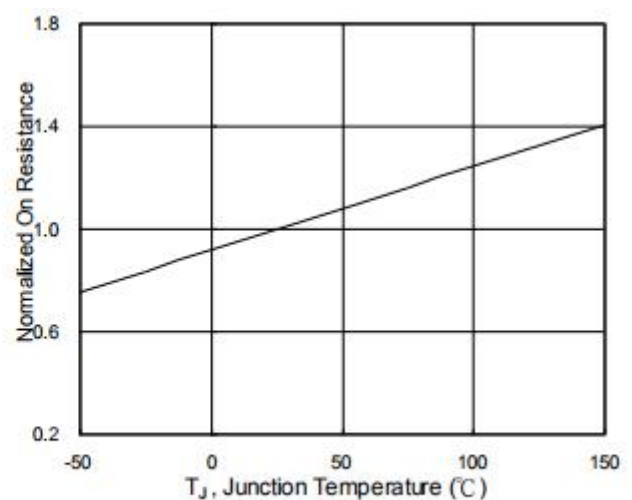


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

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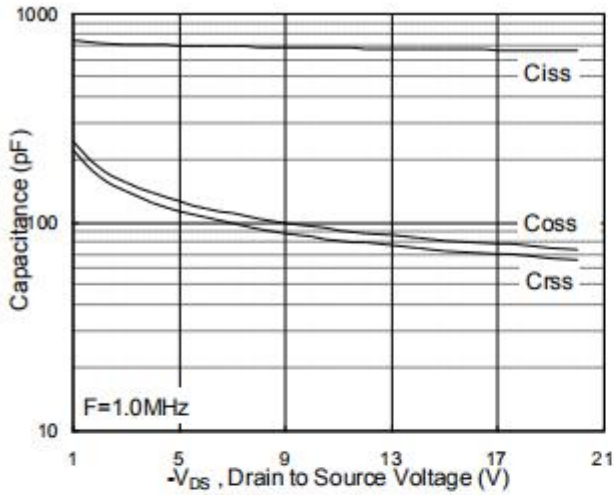


Fig.7 Capacitance

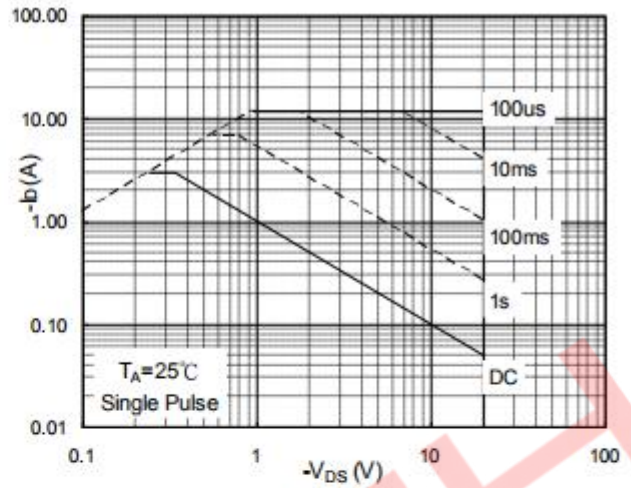


Fig.8 Safe Operating Area

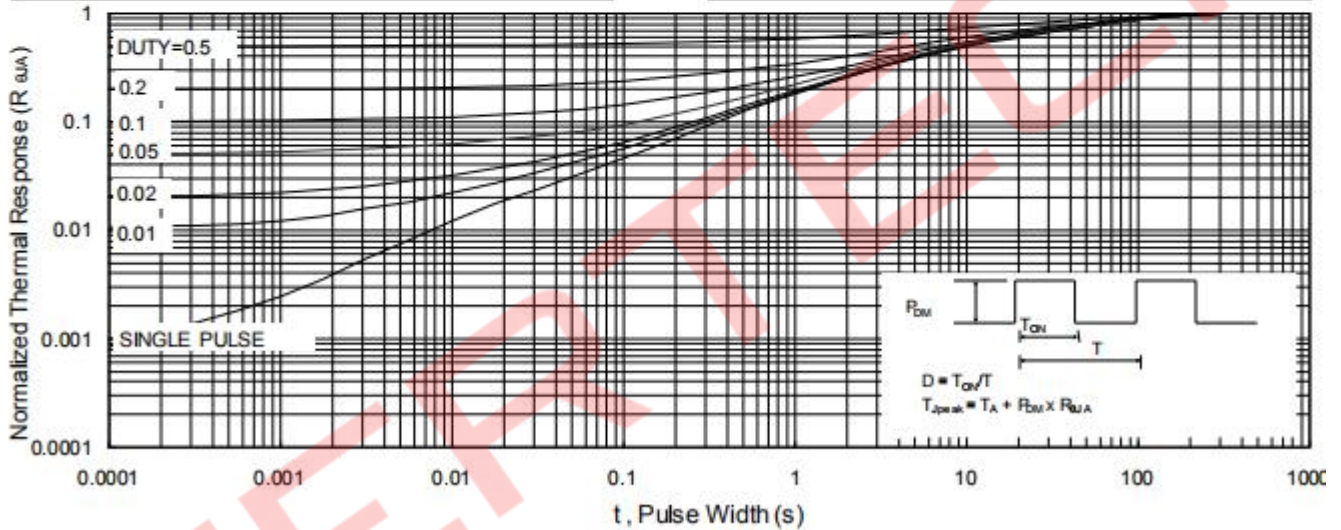


Fig.9 Normalized Maximum Transient Thermal Impedance

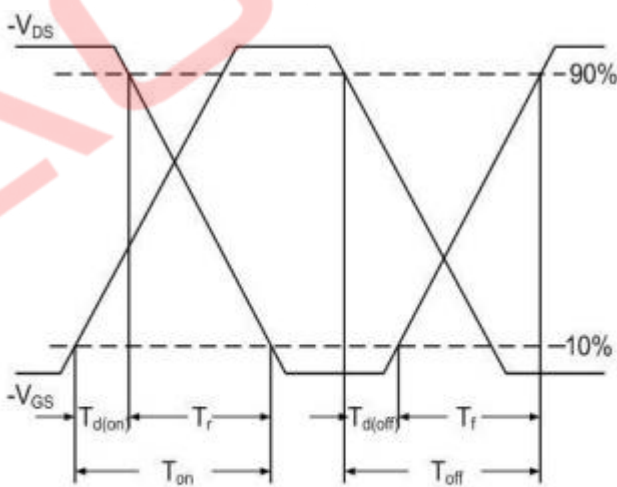


Fig.10 Switching Time Waveform

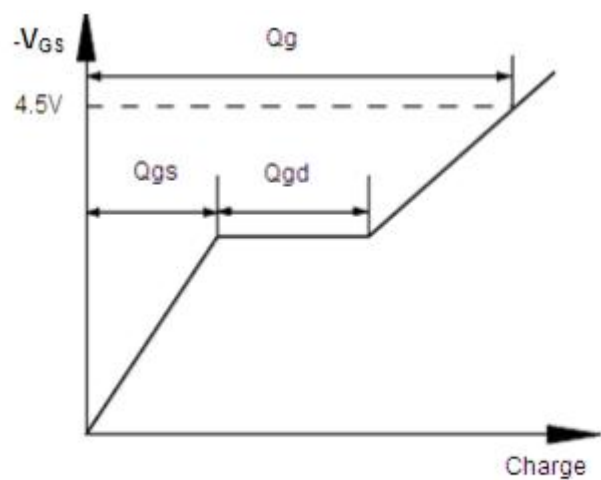
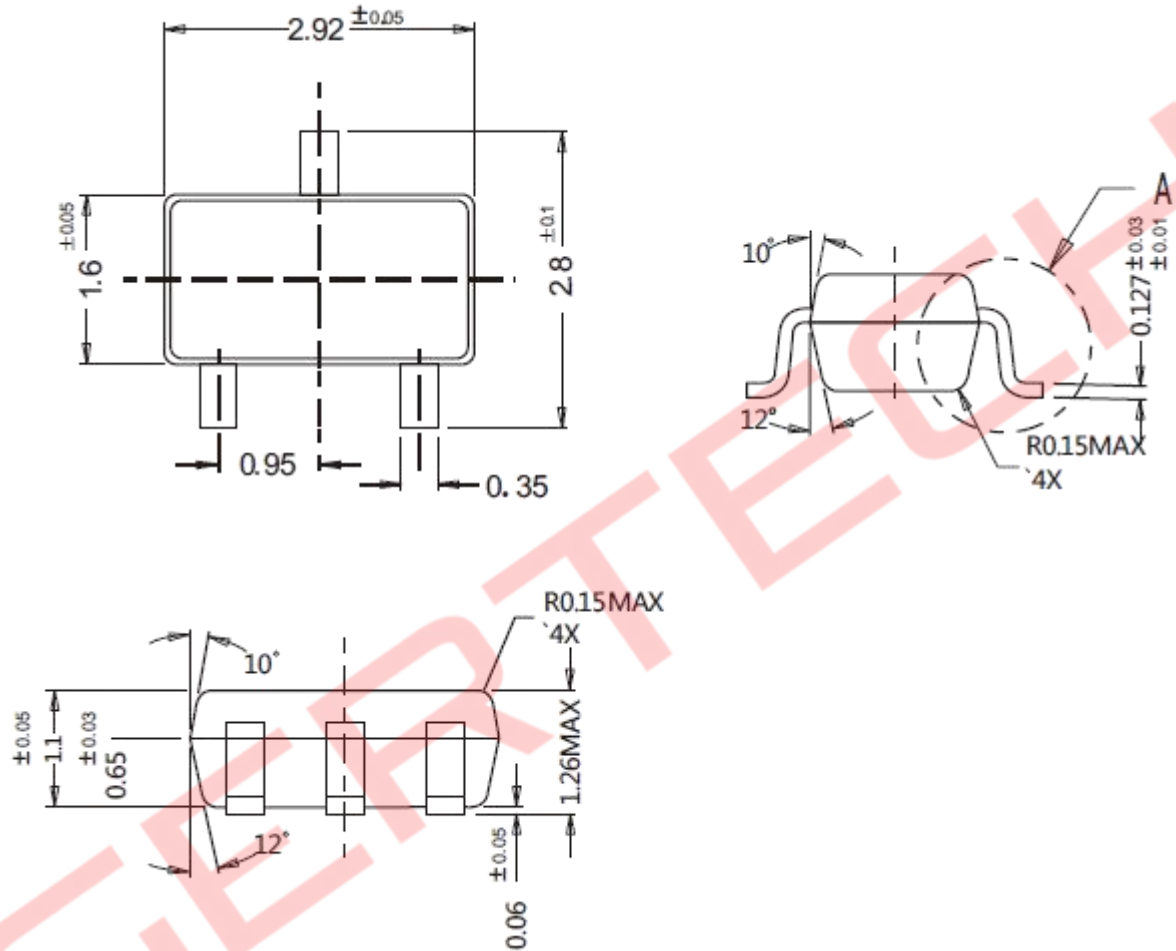


Fig.11 Gate Charge Waveform

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Package Outline

SOT23-3L



Ordering Information

Device	Package	Shipping
ATM2301PSC	SOT23-3L	3000/Reel&Tape(7inch)