

ATM1205PSI

P-Channel Enhancement Mode Field Effect Transistor

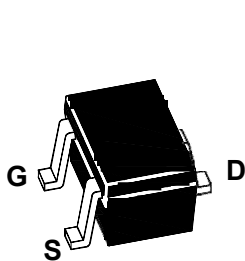
Description

The ATM1205PSI uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications. Standard Product ATM1205PSI is Pb-free.

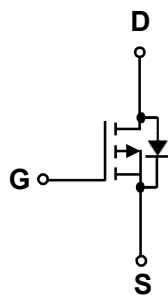
Feature

- ◆ V_{DS} (V) = -12V
- ◆ I_D = -1.7 A (V_{GS} = -4.5V)
- ◆ $R_{DS(ON)}$ < 100m Ω (V_{GS} = -4.5V)
- ◆ $R_{DS(ON)}$ < 130m Ω (V_{GS} = -3.6V)
- ◆ $R_{DS(ON)}$ < 150m Ω (V_{GS} = -2.5V)
- ◆ $R_{DS(ON)}$ < 250m Ω (V_{GS} = -1.8V)

SOT-323

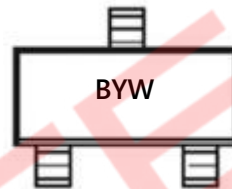


Top View



Schematic

Marking



B : Device code
YW : Date code

Order Information

Device	Package	Shipping
ATM1205PSI	SOT-323	3000/Tape&Reel

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

Parameter	Symbol	Maximum	Units
Drain-Source Voltage	V_{DS}	-12	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ^{NOET 1}	I_D	$T_A=25^\circ\text{C}$	-1.7
		$T_A=70^\circ\text{C}$	-1.4
Pulsed Drain Current ^{NOET 2}	I_{DM}	-20	A
Power Dissipation ^{NOET 1}	P_D	$T_A=25^\circ\text{C}$	0.47
		$T_A=70^\circ\text{C}$	0.30
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Typ	Max	Units
Maximum Junction-to-Ambient ^{NOET 1}	$R_{\theta JA}$	215	265	$^\circ\text{C/W}$
Maximum Junction-to-Ambient ^{NOET 1}		Steady-State	240	300
Maximum Junction-to-Lead ^{NOET 3}	$R_{\theta JL}$	105	130	$^\circ\text{C/W}$

ATM1205PSI

Electrical Characteristics (T _A =25°C unless otherwise noted)						
Parameter	Symbol	Conditions	Min	Typ	Max	Units
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =-250μA, V _{GS} =0V	-12			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-9.6V, V _{GS} =0V			-1	μA
Gate-Body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V			±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-0.45	-0.75	-1.0	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =-4.5V, I _D =-1.7A		75	100	mΩ
		V _{GS} =-3.6V, I _D =-1.0A		80	130	mΩ
		V _{GS} =-2.5V, I _D =-1.0A		103	150	mΩ
		V _{GS} =-1.8V, I _D =-0.6A		150	250	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-1.8V, I _D =-1.0A		4.8		S
Diode Forward Voltage	V _{SD}	I _S =-1.0A, V _{GS} =0V		-0.85	-1.2	V
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =-10V, f=100KHz		618		pF
Output Capacitance	C _{oss}			172		pF
Reverse Transfer Capacitance	C _{rss}			134		pF
Switching Characteristics						
Total Gate Charge	Q _{gtot}	V _{GS} =-4.5V, V _{DS} =-10V, I _D =-1.7A		8.7		nC
Gate Source Charge	Q _{gs}			1.5		nC
Gate Drain Charge	Q _{gd}			2.9		nC
Turn-On Delay Time	t _{d(on)}	V _{GS} =-4.5V, V _{DD} =-10V, I _d =-1.7A, R _{GEN} =6Ω		15.8		ns
Turn-On Rise Time	t _r			19.8		ns
Turn-Off Delay Time	t _{d(off)}			92.4		ns
Turn-Off Fall Time	t _f			139.6		ns

Note:

1. The value of R_{θJA} is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.
2. Repetitive rating, pulse width limited by junction temperature.
3. The R_{θJA} is the sum of the thermal impedance from junction to lead R_{θJL} and lead to ambient.
4. The static characteristics in Figures 1 to 6 are obtained using 80 μs pulses, duty cycle 0.5% max.
5. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulserating.

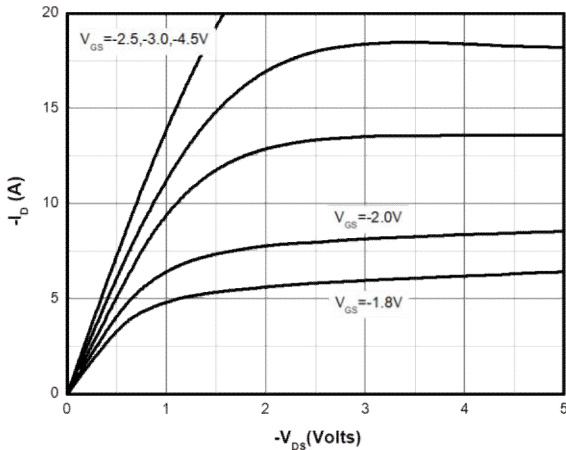


Fig 1: On-Region Characteristics

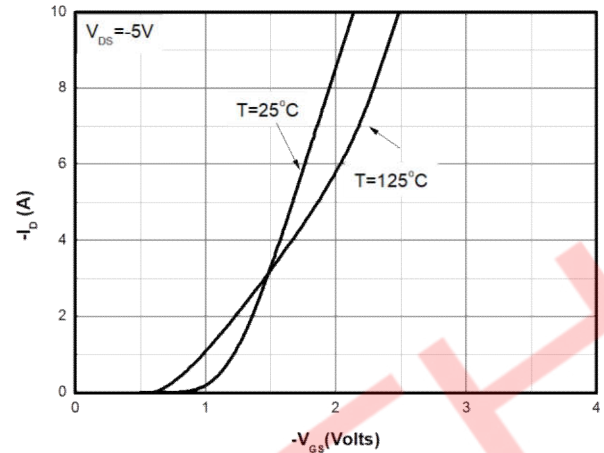


Figure 2: Transfer Characteristics

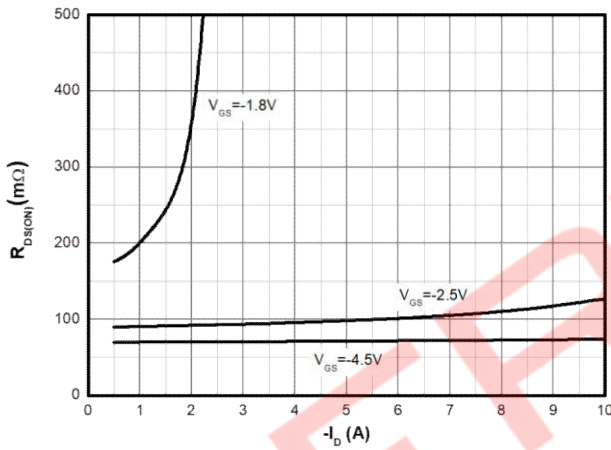


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

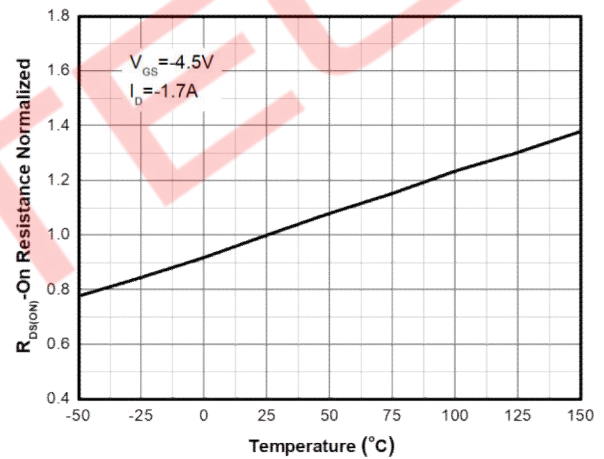


Figure 4: On-Resistance vs. Junction Temperature

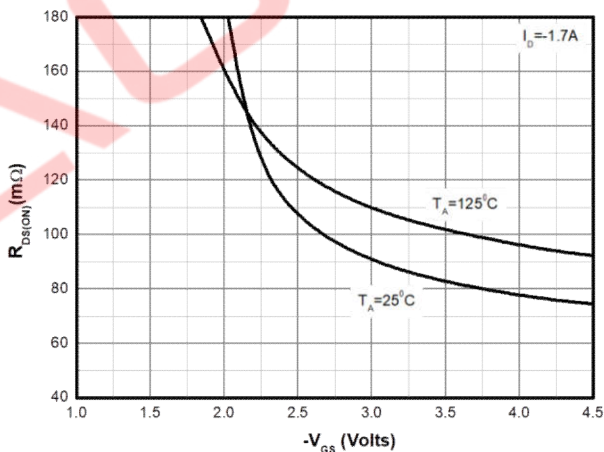


Figure 5: On-Resistance vs Gate-Source

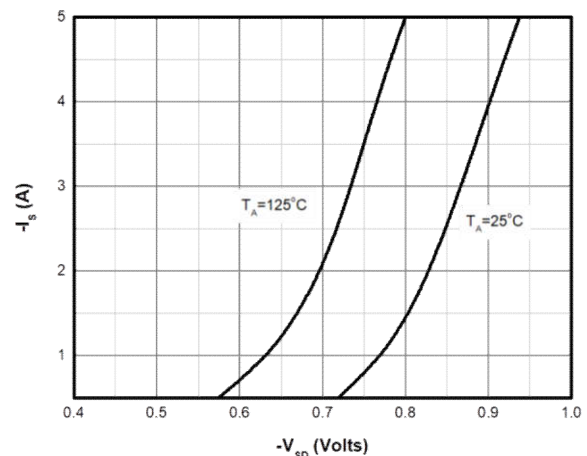


Figure 6: Body-Diode Characteristics

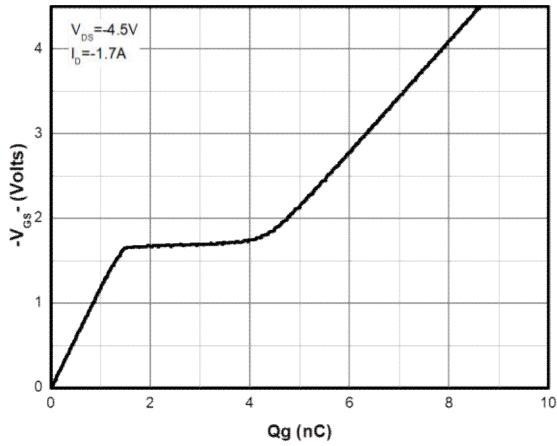


Figure 7: Gate-Charge Characteristics

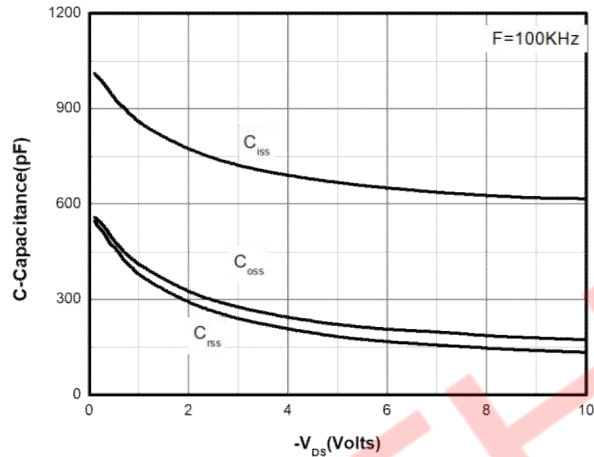


Figure 8: Capacitance Characteristics

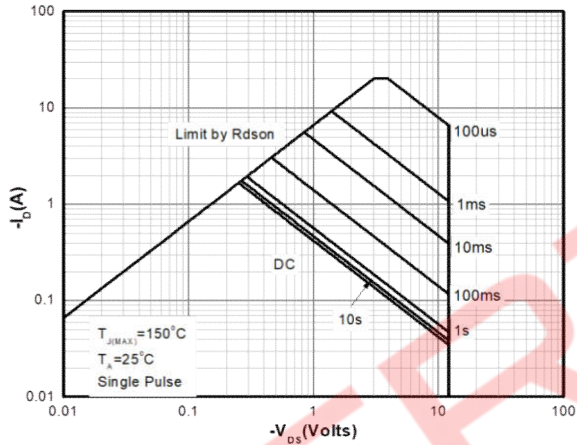


Figure 9: Maximum Forward Biased Safe Operating Area (Note 5)

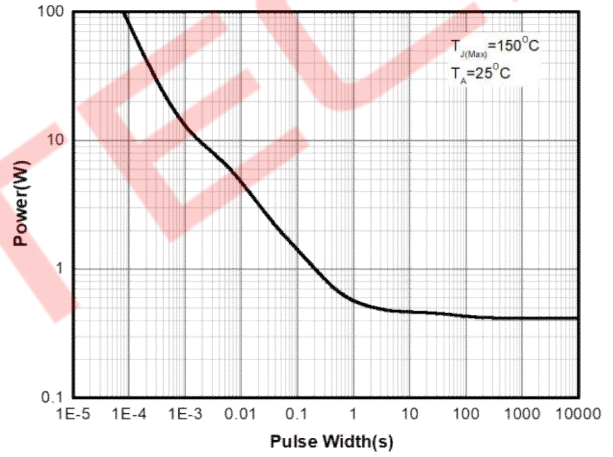


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note 5)

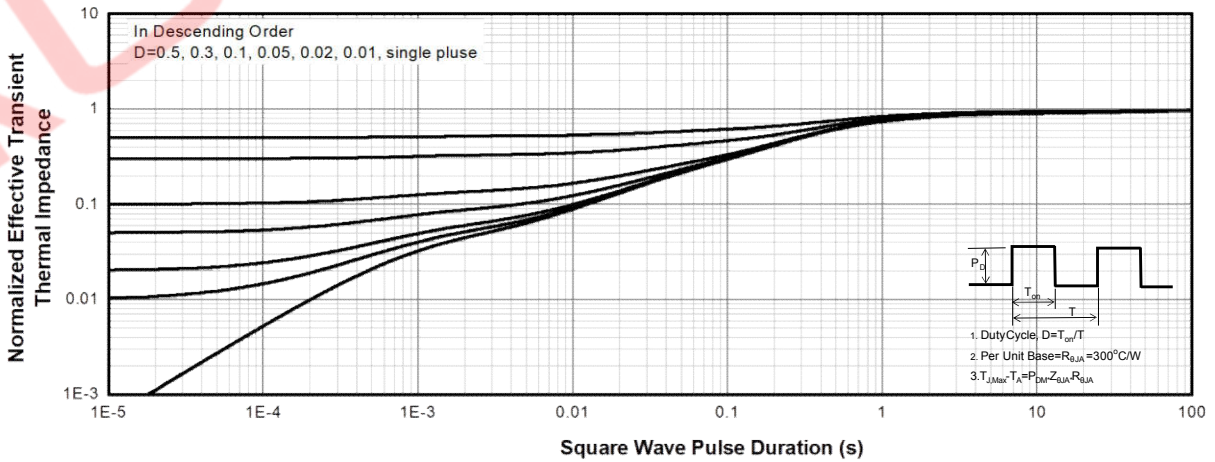
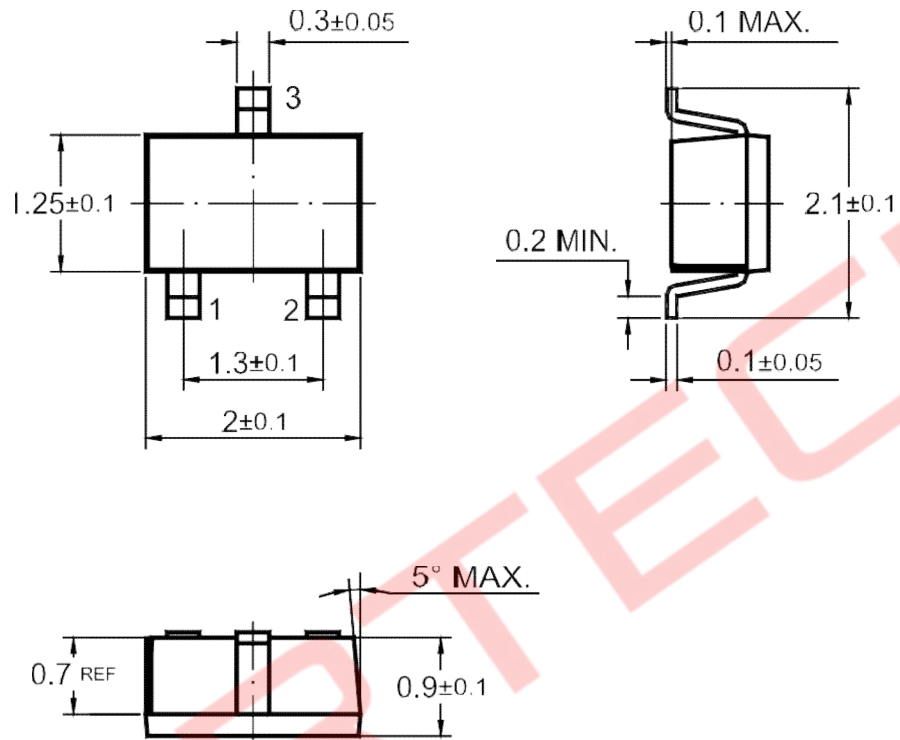


Figure 11: Normalized Maximum Transient Thermal Impedance

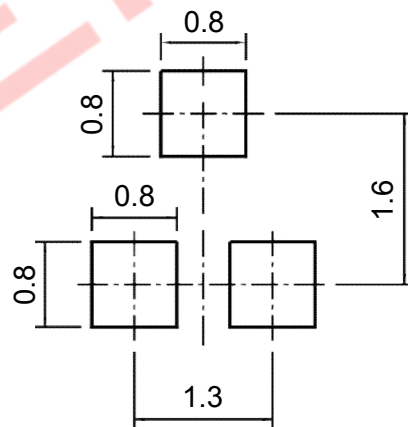
ATM1205PSI

Package Outline Dimension (Units: mm)

SOT-323



Recommended Soldering Footprint



Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
SOT-323	8	4 ± 0.1	0.157 ± 0.004	178	7	3,000

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