



AT-PM3401B

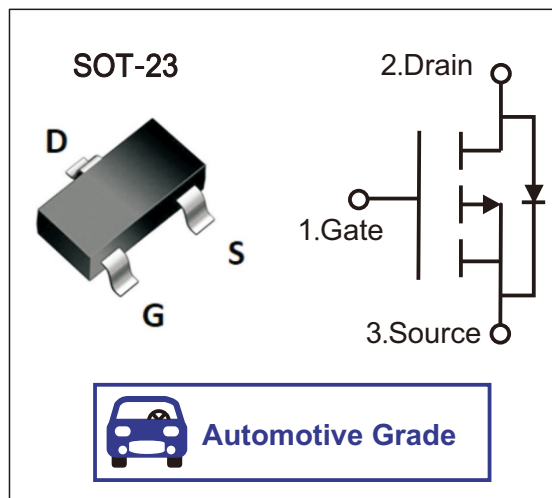
-4.2A -30V P-CHANNEL MOSFET

Features

- $V_{DS} = -30V, I_D = -4.2A$
- $R_{DS(ON)} < 100m\Omega @ V_{GS} = -2.5V$
- $R_{DS(ON)} < 74m\Omega @ V_{GS} = -4.5V$
- $R_{DS(ON)} < 59m\Omega @ V_{GS} = -10V$
- High Power and Current Handling Capability
- Surface Mount Package
- Lead Free Product is Acquired
- Qualified to AEC-Q101 Standards for High Reliability

Application

- Load Switch
- PWM Applications
- Power Management



Absolute Maximum Ratings (TA=25°C, unless otherwise specified)

Parameter	Symbols	Limit	Units
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	I_D	-4.2	A
Pulsed Drain Current (Note 1)	I_{DM}	-30	A
Power Dissipation	P_D	1.2	W
Operation Junction Temperature and Storage Temperature	T_j, T_{stg}	-55 ~ +150	°C

Electrical Characteristics (TA=25°C, unless otherwise specified)

Parameter	Symbols	Test Conditions	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = -24V, V_{GS} = 0V$			-1.0	μA
Gate- Source Leakage Current	Forward	I_{GSS}			100	nA
	Reverse				-100	



Electrical Characteristics (TA=25°C, unless otherwise specified)

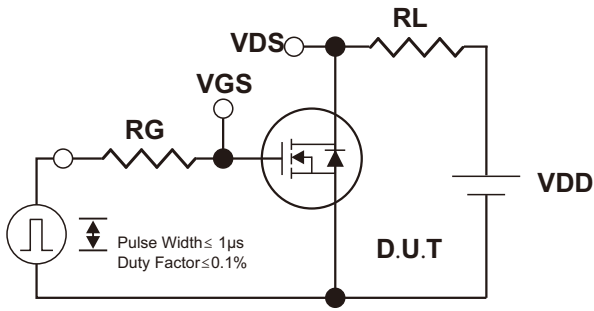
Parameter	Symbols	Test Conditions	Min	Typ	Max	Units
On Characteristics (Note 2)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.6	-0.88	-1.3	V
Static Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -4.2A$		49	59	mΩ
		$V_{GS} = -4.5V, I_D = -4A$		57	74	mΩ
		$V_{GS} = -2.5V, I_D = -2A$		79	100	mΩ
Forward Transconductance	G_{FS}	$V_{DS} = -5V, I_D = -4.2A$		10		S
Dynamic Characteristics (Note 3)						
Input Capacitance	C_{ISS}	$V_{DS} = -15V,$		880		pF
Output Capacitance	C_{OSS}	$V_{GS} = 0V,$		105		pF
Reverse Transfer Capacitance	C_{RSS}	$F = 1.0MHz$		65		pF
Switching Characteristics (Note 3)						
Total Gate Charge	Q_G	$V_{DS} = -15V, V_{GS} = -4.5V,$ $I_D = -4.2A$		8.5		nC
Gate-Source Charge	Q_{GS}			1.8		nC
Gate-Drain Charge	Q_{GD}			2.7		nC
Turn-On Delay Time	$T_{D(on)}$	$V_{DS} = -15V, V_{GS} = -10V,$ $I_D = -4.2A, R_{GEN} = 6\Omega$		7		ns
Turn-On Rise Time	T_R			3		ns
Turn-Off Delay Time	$T_{D(off)}$			30		ns
Turn-Off Fall Time	T_F			12		ns
Drain-Source Diode Characteristics And Maximum Ratings						
Drain-Source Diode Forward Voltage (Note 2)	V_{SD}	$I_S = -1A, V_{GS} = 0V$			-1.4	V

Notes:

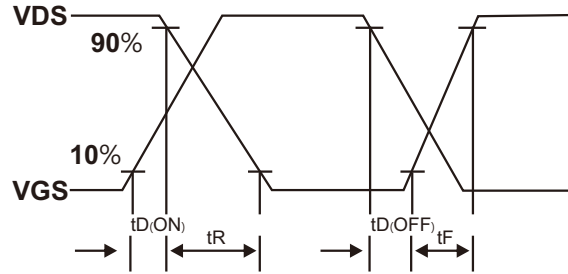
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty cycle $\leq 2\%$.
3. Guaranteed by design, not subject to production



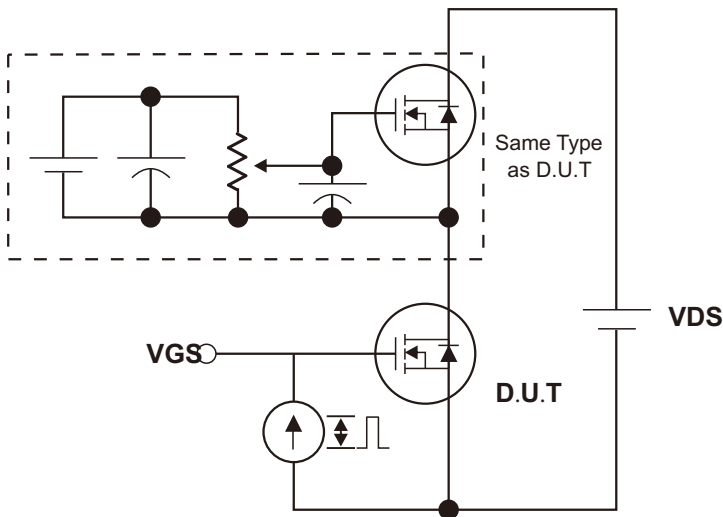
Test Circuits and waveforms



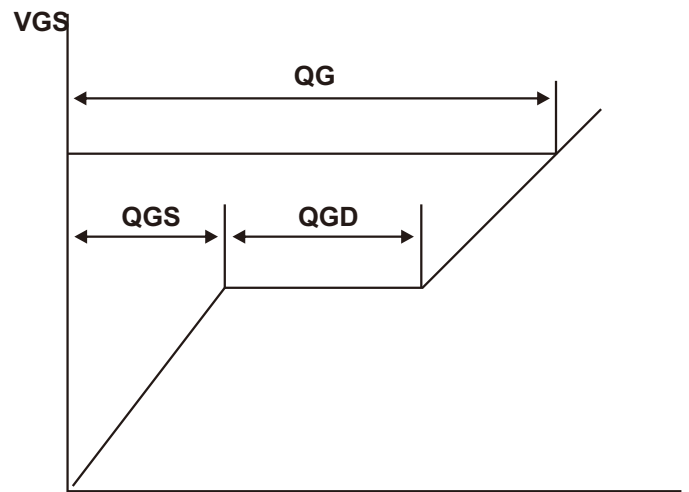
Switching Test Circuit



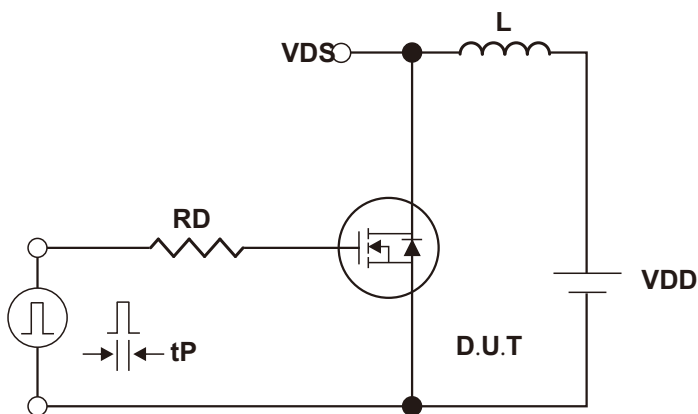
Switching Waveforms



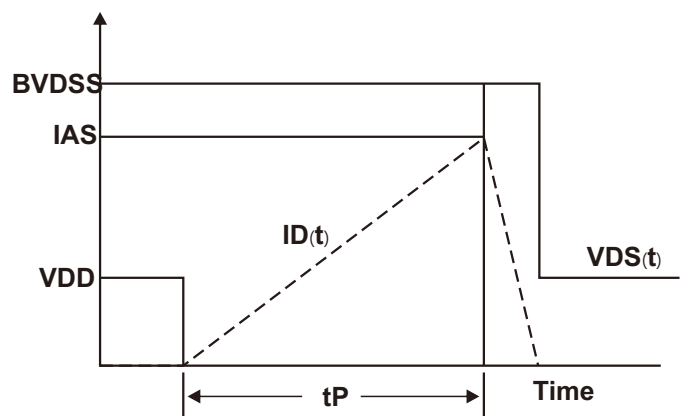
Gate Charge Test Circuit



Charge
Gate Charge Waveform



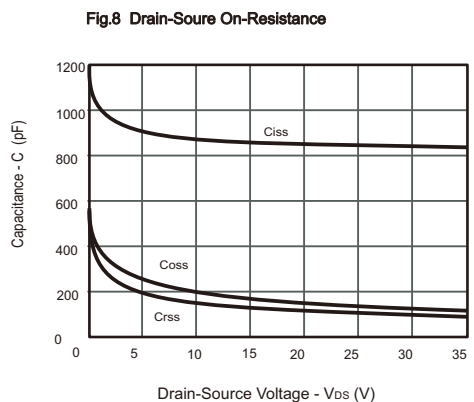
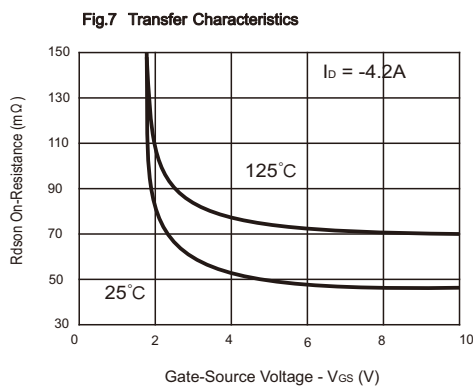
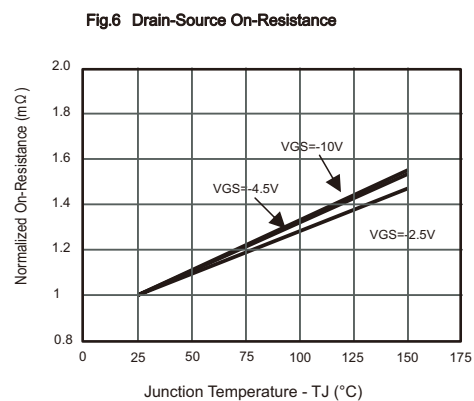
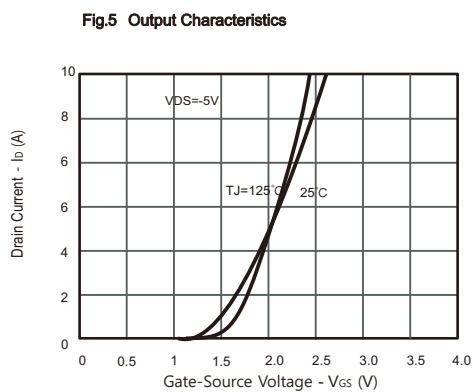
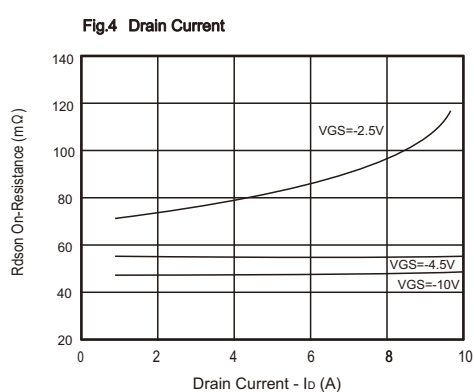
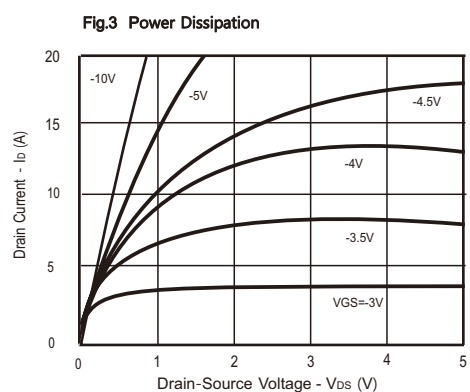
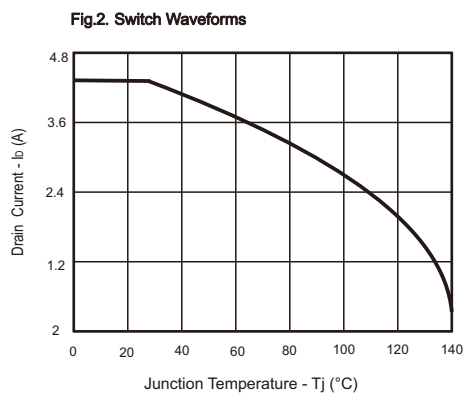
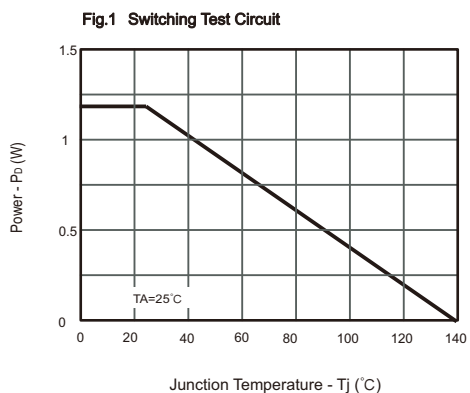
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

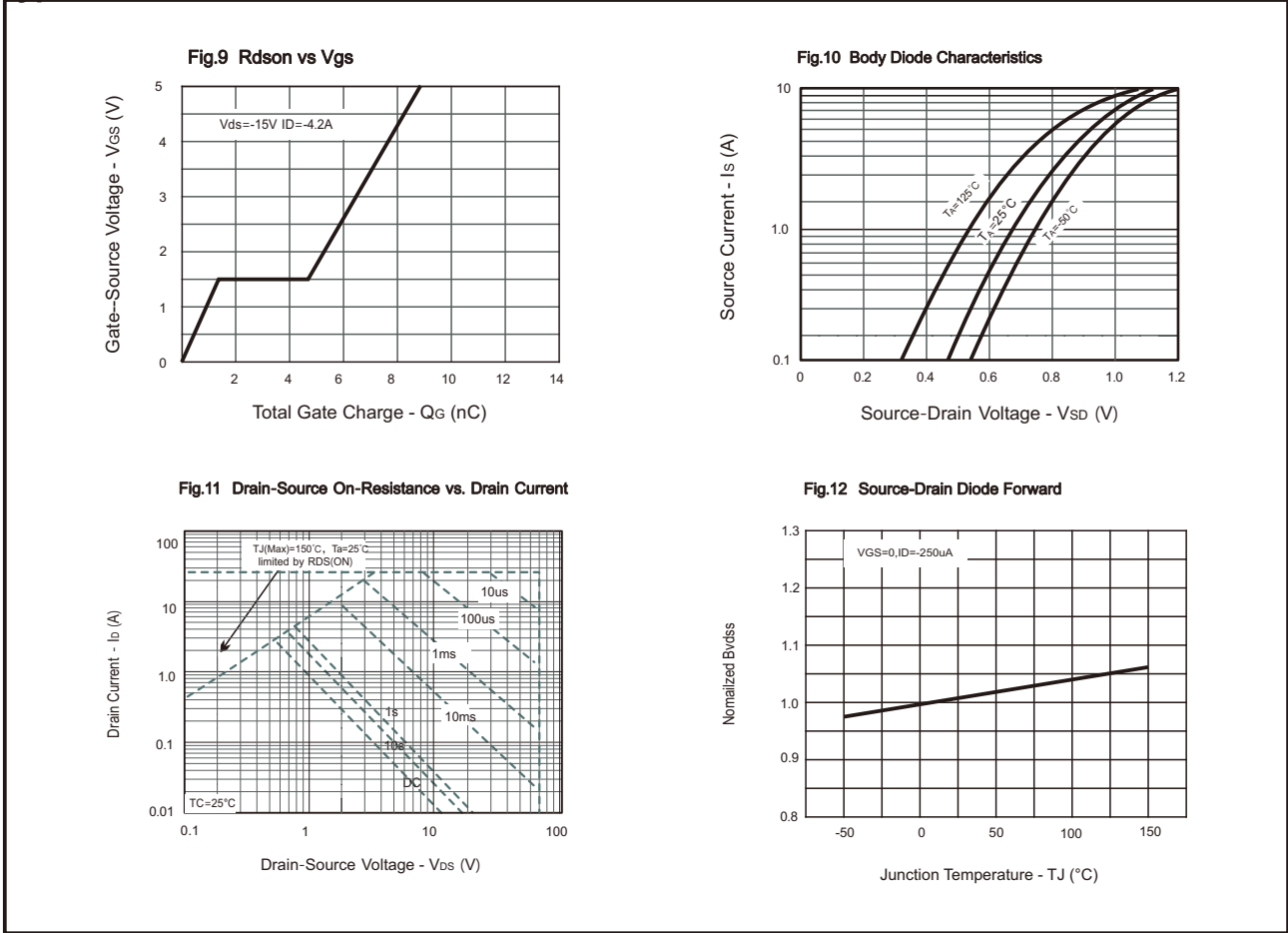


Typical Characteristics



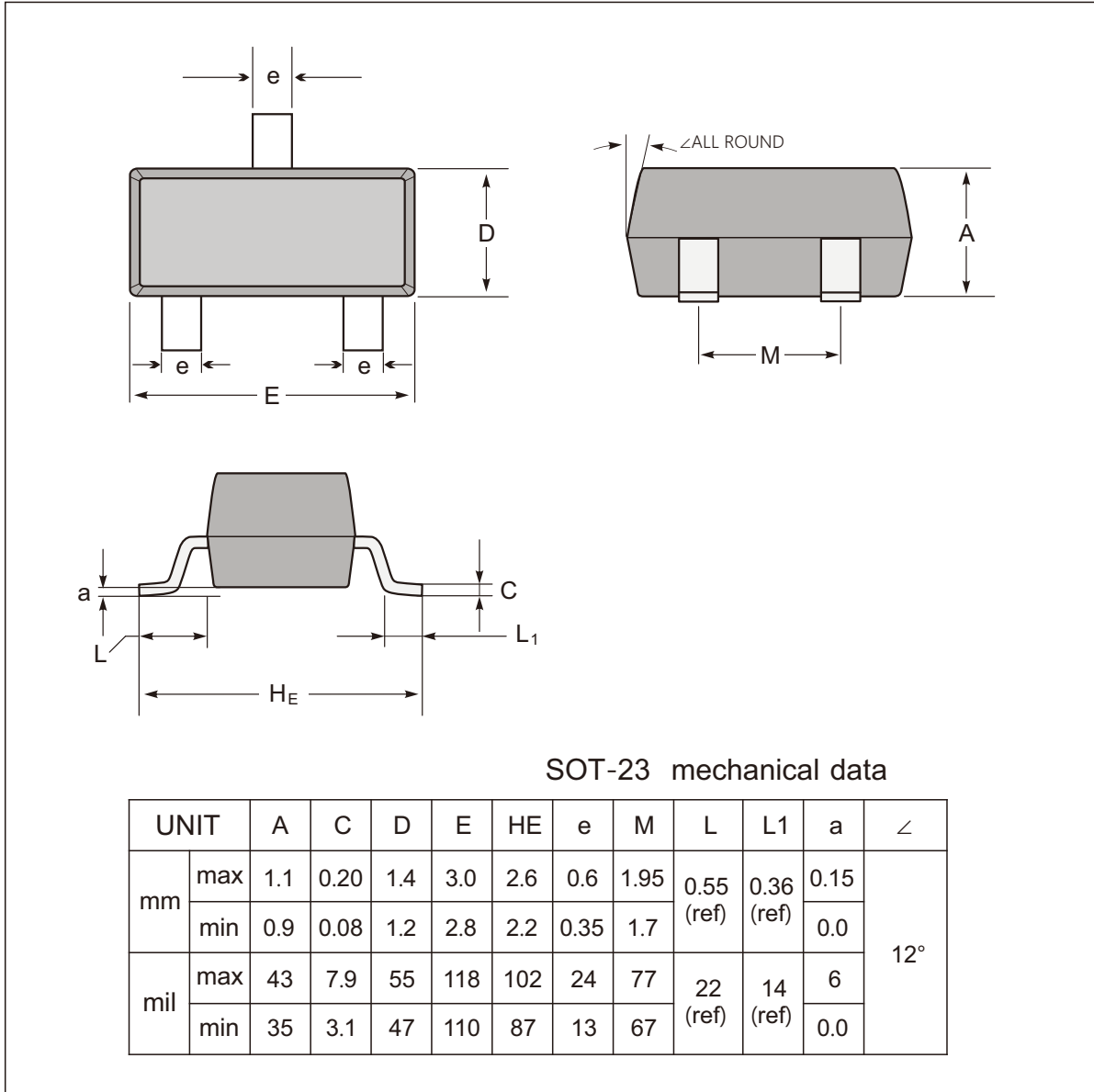


Typical Characteristics

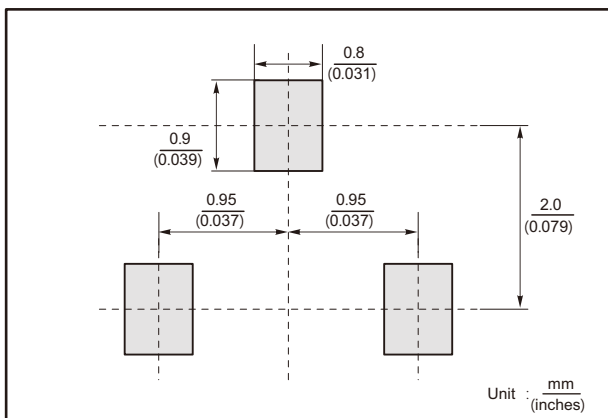




SOT-23 Package Outline Dimensions



The recommended mounting pad size



Marking

Type number	Marking code
AT-PM3401B	3401B



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