



DESCRIPTION

P-channel Enhancement Mode Power MOSFET

FEATURES

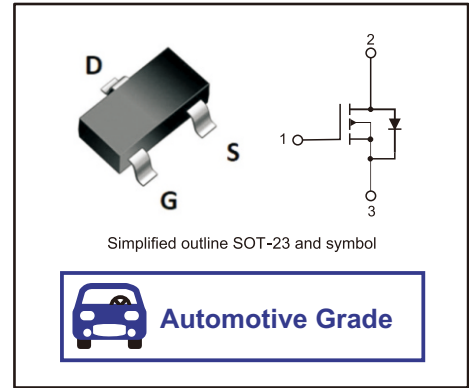
- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired
- Qualified to AEC-Q101 Standards for High Reliability

APPLICATION

- PWM Applications
- Load Switch
- Power Management

PINNING

PIN	DESCRIPTION
1	GATE
2	DRAIN
3	SOURCE



MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	-20	V
Gate-Source Voltage	V_{GSS}	±12	V
Continuous Drain Current	I_D	TA=25°C	-3
		TA=75°C	-1.7
Pulsed Drain Current	I_{DM}	-9	A
Power Dissipation	P_D	TA=25°C	1.4
		TA=75°C	0.84
Thermal Resistance-Junction to Ambient	$R_{\theta JA}$	90	°C/W
Junction Temperature	T_j	150	°C
Storage Temperature	T_{stg}	-55 to +150	°C



ELECTRICAL CHARACTERISTICS(Ta=25°C unless otherwise noted.)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.4	-0.7	-1	V
Static Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -3A$		58	75	m Ω
		$V_{GS} = -2.5V, I_D = -2A$		80	90	
Forward Transconductance	g_{FS}	$V_{DS} = -5V, I_D = -2.3A$		6.5		S
Dynamic Characteristics						
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	
Switching Characteristics						
Total Gate Charge	Q_g	$V_{DS} = -10V$ $V_{GS} = -2.5V$ $I_D = -2.3A$		3.3	6	nC
Gate-Source Charge	Q_{gs}			0.7		
Gate-Drain Charge	Q_{gd}			1.3		
Switching Characteristics						
Turn-On Delay Time	$t_{d(on)}$	$V_{DS} = -10V,$ $R_{GEN}=1\Omega,$ $V_{GS}=-4.5V,$ $I_D=-1A,$ $R_L=10\Omega$		11	20	ns
Turn-On Rise Time	t_{rr}			35	60	
Turn-Off Delay Time	$t_{d(off)}$			30	50	
Turn-Off Fall Time	t_f			10	20	
Body Diode Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S = -1A, V_{GS} = 0V$		-0.8	-1.2	V



Typical Performance Characteristics

Fig 1. Output Characteristics

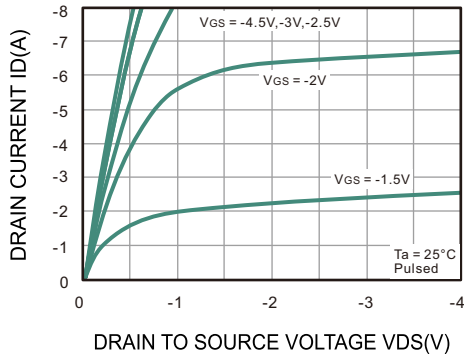


Fig 2. Transfer Characteristics

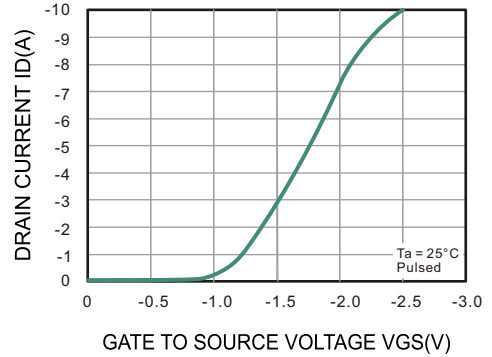


Fig 3. $R_{DS(ON)}$ — I_D

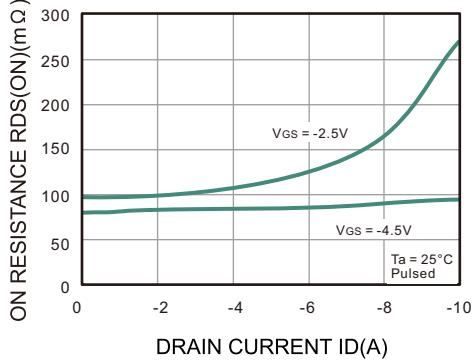


Fig 4. $R_{DS(ON)}$ — V_{GS}

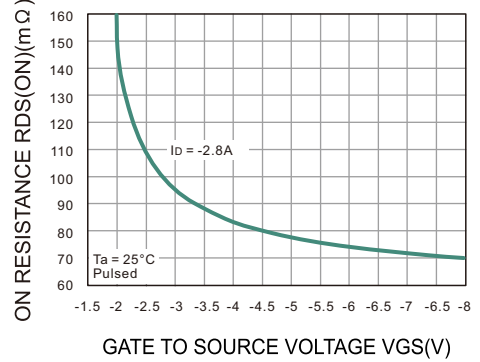
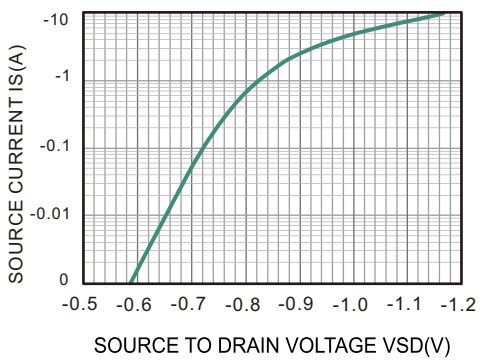
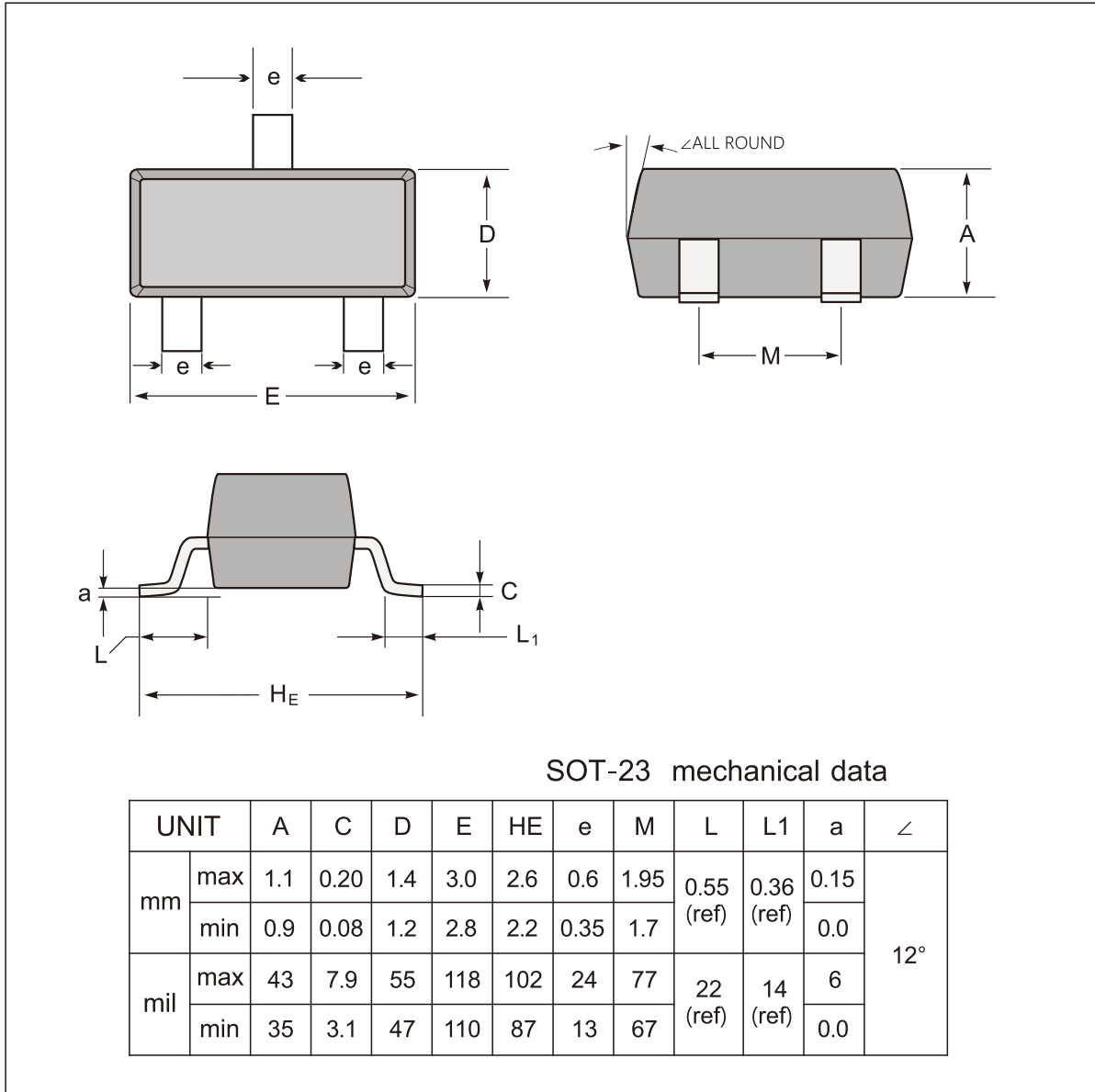


Fig 5. I_S — V_{SD}

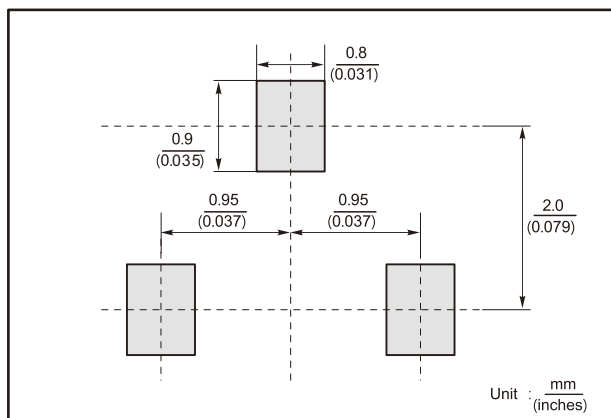




SOT-23 Package Outline Dimensions



The recommended mounting pad size



Marking

Type number	Marking code
AT-PM2301DWD	1HD



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