



## DESCRIPTION

P-channel Enhancement Mode Power MOSFET

## FEATURES

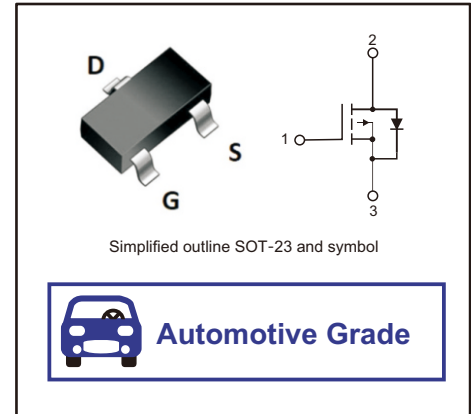
- $V_{DS}=-20V, I_D=-2.5A$   
 $R_{DS(ON)}<120m\Omega@V_{GS}=-4.5V$   
 $R_{DS(ON)}<160m\Omega@V_{GS}=-2.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead free product is acquired
- Qualified to ACE-Q101 Standards for High Reliability

## APPLICATION

- PWM Applications
- Load Switch
- Power Management

## PINNING

PIN	DESCRIPTION
1	GATE
2	DRAIN
3	SOURCE



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

Parameter	Symbols	Ratings	Units
Drain-Source Voltage	$V_{DSS}$	-20	V
Gate-Source Voltage	$V_{GSS}$	$\pm 12$	V
Continuous Drain Current	$I_D$	-2.5	A
Pulsed Drain Current	$I_{DM}$	-10	A
Power Dissipation	$P_D$	1.2	W
Thermal Resistance - Junction to Case ( Note3 )	$R_{\theta JA}$	104	°C/W
Operation Junction Temperature and Storage Temperature	$T_j, T_{stg}$	-55 ~ +150	°C



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

Parameter	Symbols	Text conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$B_{VDSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$			-1	$\mu A$
Gate- Source Leakage Current	Forward	$I_{GSS}$			100	nA
	Reverse				-100	
<b>On Characteristics</b>						
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	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-2.5A$		90	120	$m\Omega$
		$V_{GS}=-2.5V, I_D=-1.5A$		110	160	$m\Omega$
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S=-2.5A, V_{GS}=0V$			-1.2	V
<b>Dynamic Characteristics ( Note5 )</b>						
Input Capacitance	$C_{iss}$	$V_{DS}=-10V,$		285		pF
Output Capacitance	$C_{oss}$	$V_{GS}=0V,$		58		pF
Reverse Transfer Capacitance	$C_{rss}$	$f=1.0MHz$		32		pF
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS}=-10V, V_{GS}=-4.5V,$ $I_D=-2.5A$ ( Note1,2 )		2.9		nC
Gate-Source Charge	$Q_{gs}$			0.45		nC
Gate-Drain Charge	$Q_{gd}$			0.75		nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=-10V, R_{GEN}=3\Omega,$ $V_{GS}=-4.5V, R_L=5\Omega$ ( Note1,2 )		9.8		ns
Turn-On Rise Time	$t_r$			4.9		ns
Turn-Off Delay Time	$t_{d(off)}$			20.5		ns
Turn-Off Fall Time	$t_f$			7		ns
Turn-Off Delay Time						
Continuous Current	$I_S$				-2.5	A
Pulsed Current	$I_{SM}$				-10	A

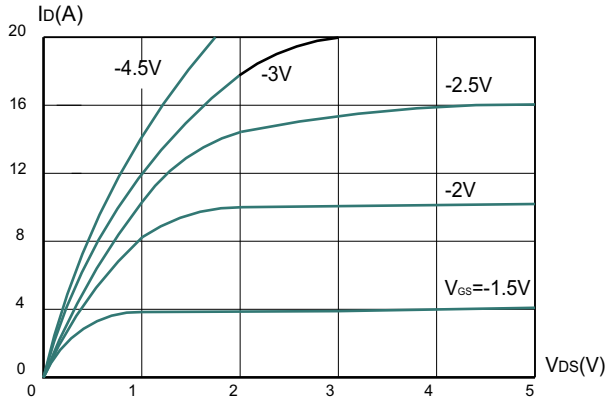
Notes:

1. Pulse Test: Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$ .
2. Essentially independent of operating temperature typical characteristics.
3. RJA is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins mounted on a 1 inch FR-4 with 2oz. square pad of copper
4. The maximum current rating is package limited
5. Guaranteed by design, not subject to production testing

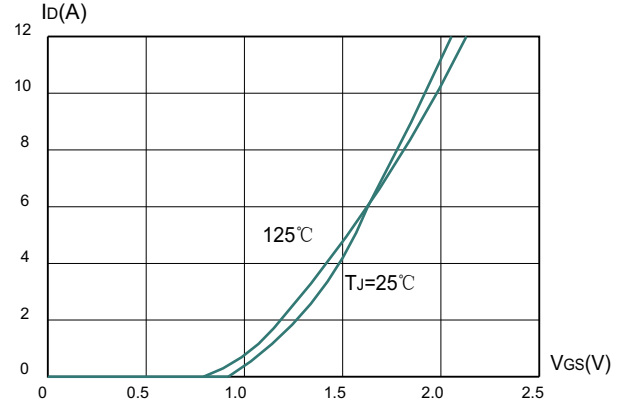


## Typical Performance Characteristics

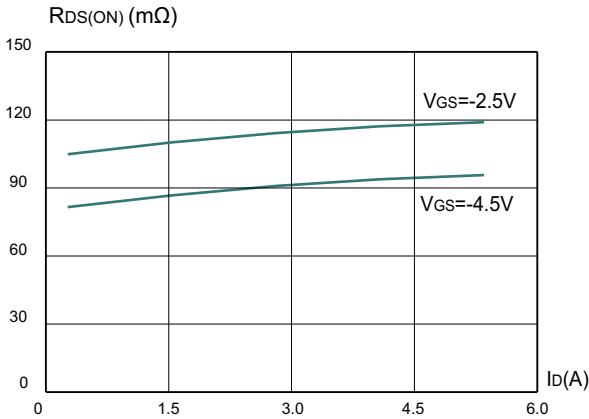
**Figure1:** Output Characteristics



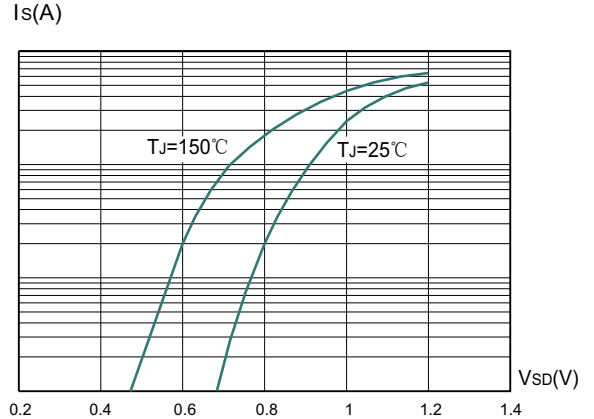
**Figure2:** Typical Transfer Characteristics



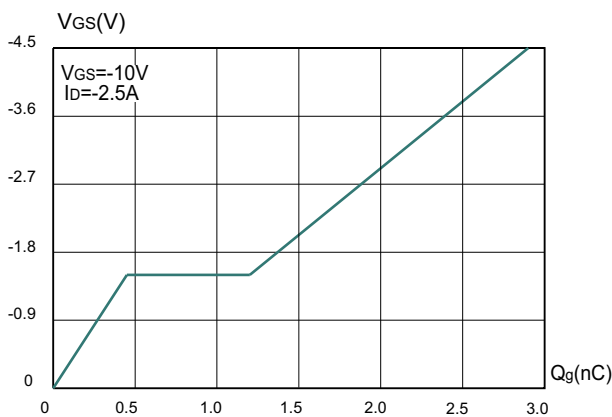
**Figure 3:** On-resistance vs. Drain Current



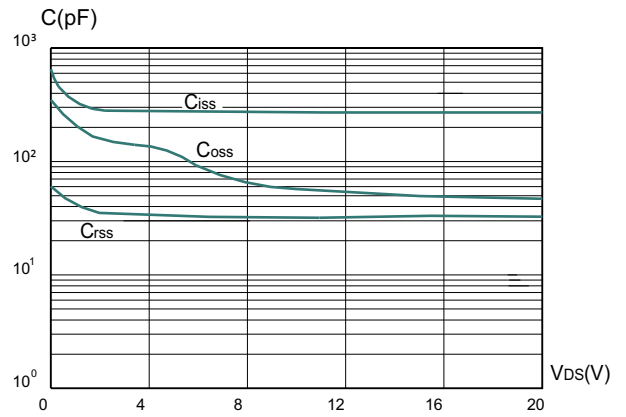
**Figure4 :** Body Diode Characteristics



**Figure 5:** Gate Charge Characteristics

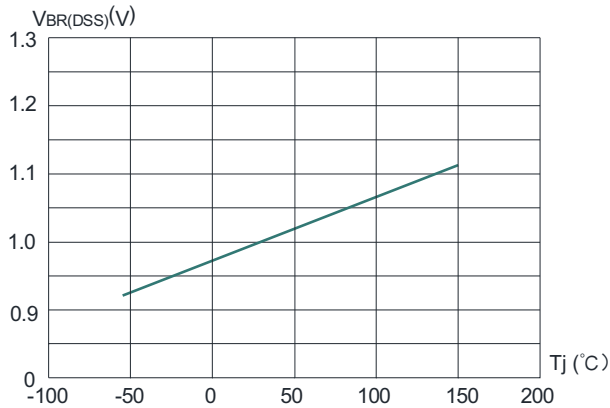


**Figure 6:** Capacitance Characteristics

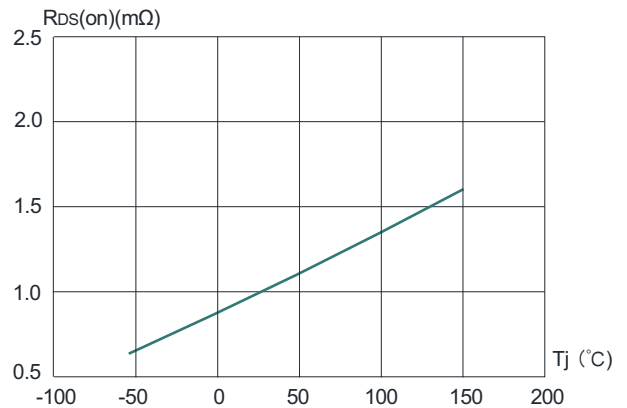




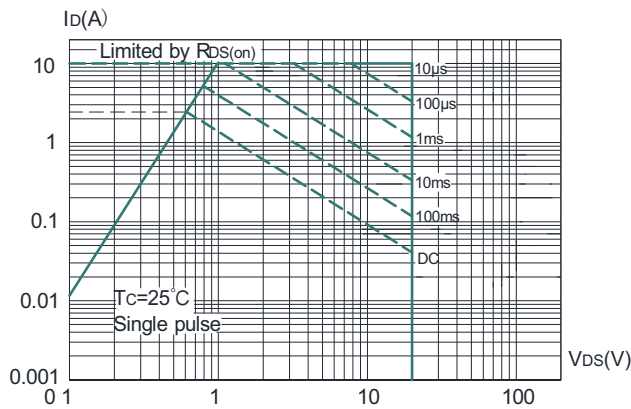
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



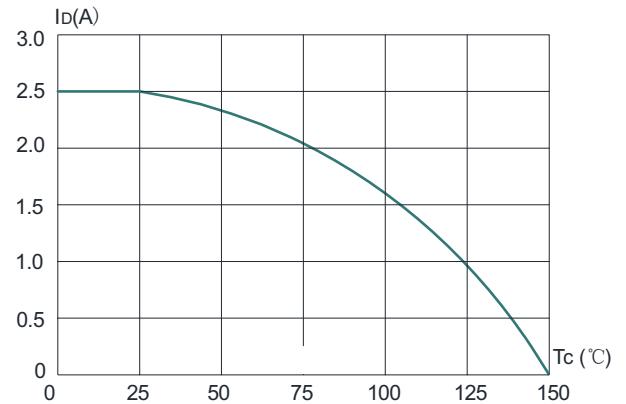
**Figure 8:** Normalized on Resistance vs. Junction Temperature



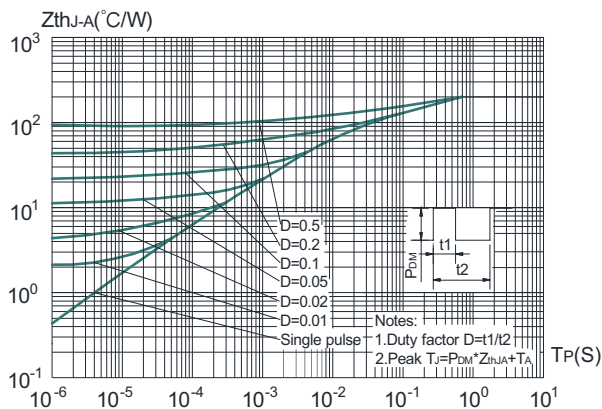
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature

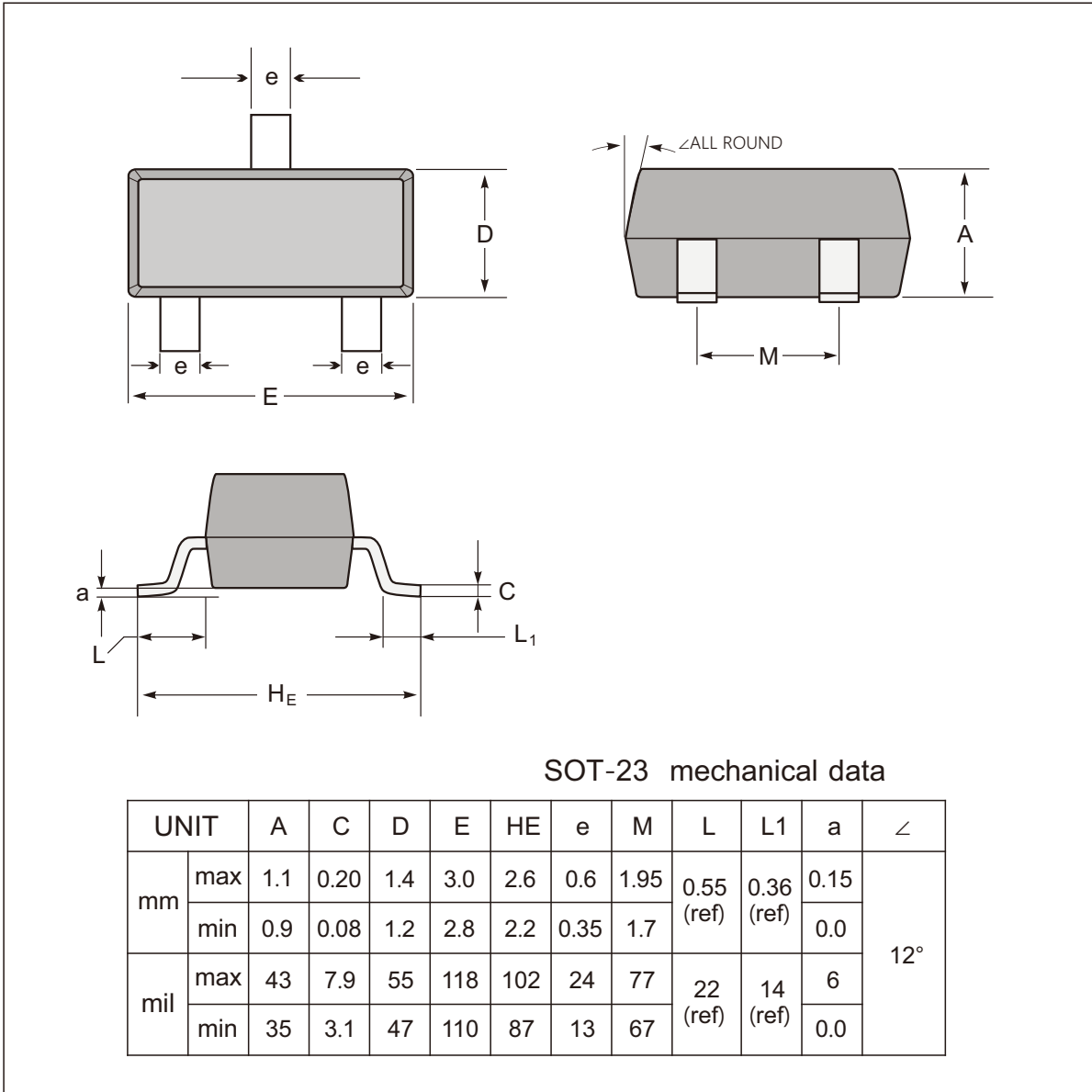


**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

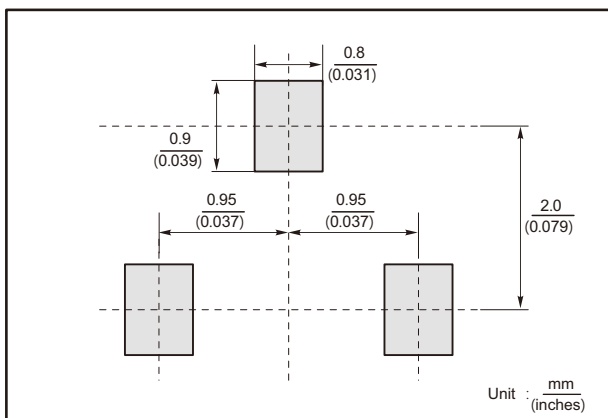




### SOT-23 Package Outline Dimensions



#### The recommended mounting pad size



#### Marking

Type number	Marking code
PM2301WD	2301



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