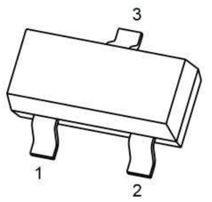
AP2333LVA0

-12V P-Channel Trench Power MOSFET

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-12V	32mΩ@-4.5V	-4.1A
	46mΩ@-2.5V	

SOT-23

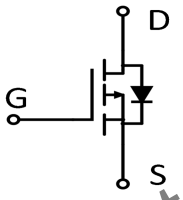


PIN1:GATE

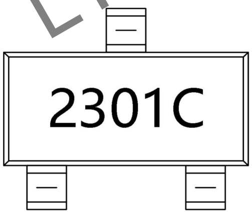
PIN2:SOURCE

PIN3:DRAIN

Schematic diagram



Marking



Features

- Very Low On-resistance $R_{DS(ON)}$
- LowCrss
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability

Applications

- Battery protection
- Load switch
- Power management

Absolute Maximum rating（T_A = 25℃ unless otherwise noted）

Parameter		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	-12	V
Gate-Source Voltage		V_{GS}	±10	V
Drain Current		I_D	-4.1	A
Drain Current - Pulsed		I_{DM}	-15	A
Power Dissipation	T_A = 25℃	P_D	0.35	W
Thermal Resistance, Junction-to-Ambient		$R_{\theta JA}$	357	℃/W
Operating and Storage Temperature Range		T_J, T_{STG}	-55 to +150	℃

Electrical Characteristics（T_A = 25℃ unless otherwise noted）

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain - Source Breakdown Voltage	BV_{DSS}	V_{GS}= 0V, I_D= -250μA	-12			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}= -12V, V_{GS}= 0V			-1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS}= ±10V, V_{DS}= 0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}= V_{GS}, I_D= -250μA	-0.4	-0.65	-1	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS}= -4.5V, I_D= -3A		32	45	mΩ
		V_{GS}= -2.5V, I_D= -3A		46	60	
		V_{GS}= -1.8V, I_D= -1A		70	90	
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}= -6V, V_{GS}=0V, F= 1.0MHz		500		pF
Output Capacitance	C_{oss}			117		
Reverse Transfer Capacitance	C_{rss}			100		
Switching Characteristics						
Total Gate Charge	Q_g	V_{GS}= -4.5V, V_{DS}= -6V, I_D= -3.8A		8.5		nC
Gate-source Charge	Q_{gs}			1.5		
Gate-drain Charge	Q_{gd}			2.6		
Turn-on Delay Time	$t_{d(on)}$	V_{GS}= -4.5V, V_{DS}= -6V, I_D= -3.8A R_{GEN}= 3Ω		6		ns
Turn-on Rise Time	t_r			35		
Turn-off Delay Time	$t_{d(off)}$			50		
Turn-off Fall Time	t_f			51		
Source - Drain Diode Characteristics						
Drain to Source Diode Forward Voltage	V_{SD}	V_{GS}= 0V, I_{SD}= -3.8A,T_J= 25℃			-1.2	V

Typical Characteristic

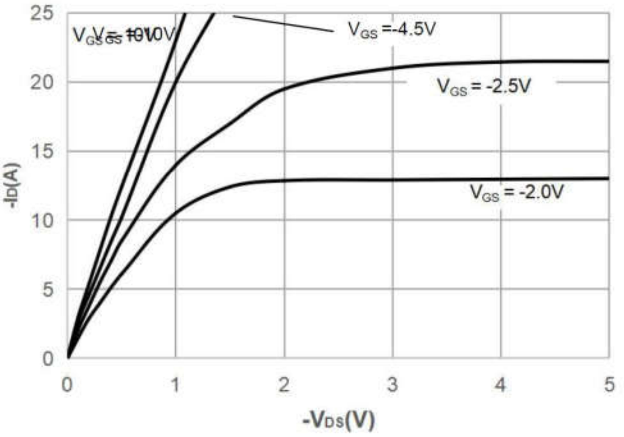


Figure 1: Output Characteristics

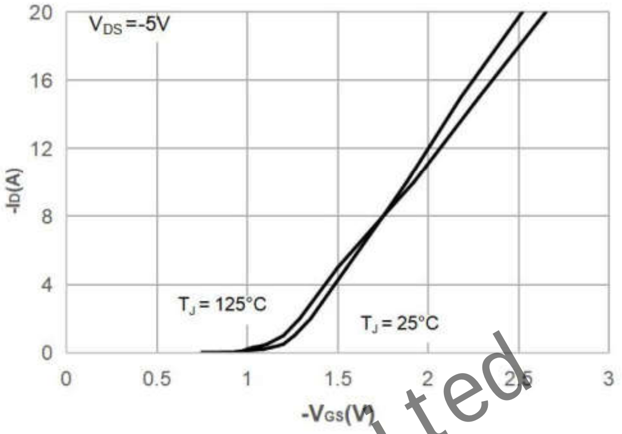


Figure 2: Typical Transfer Characteristics

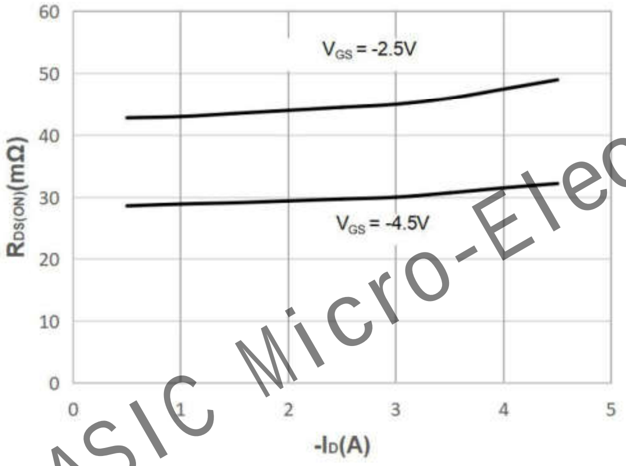


Figure 3: On-resistance vs. Drain Current

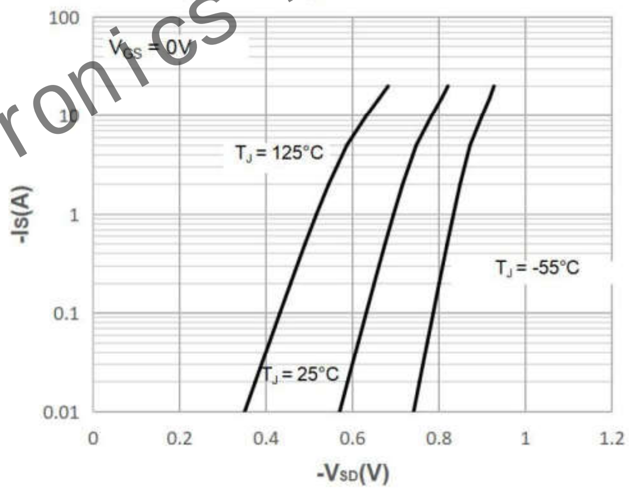


Figure 4: Body Diode Characteristics

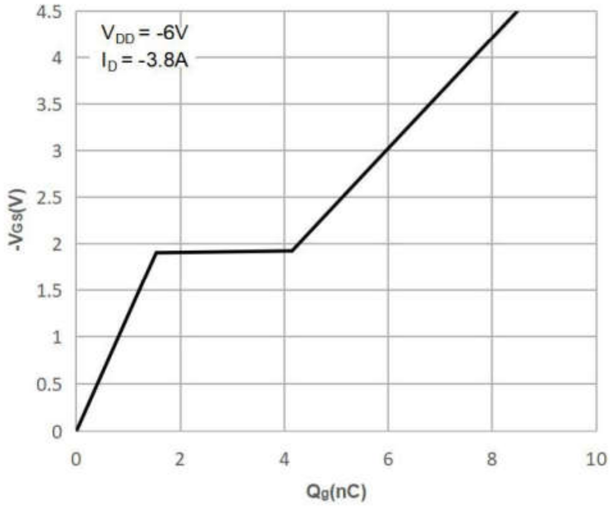


Figure 5: Gate Charge Characteristics

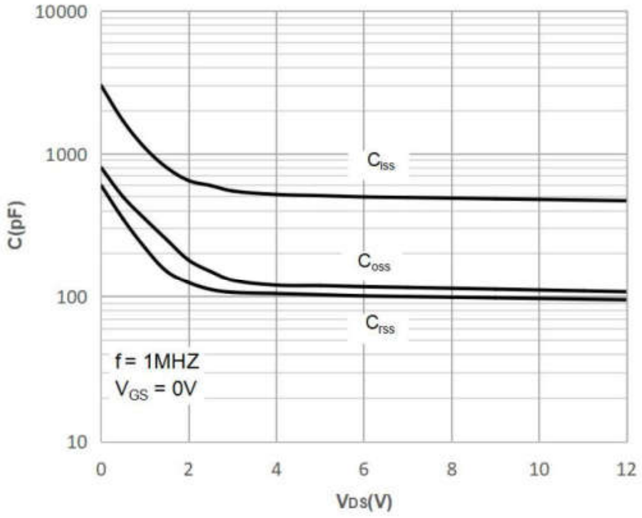


Figure 6: Capacitance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

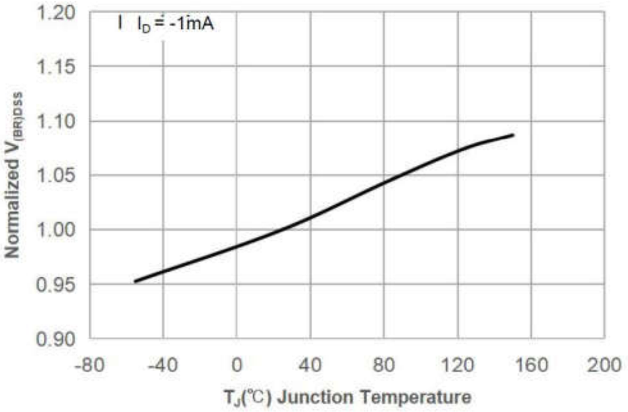


Figure 8: Normalized on Resistance vs. Junction Temperature

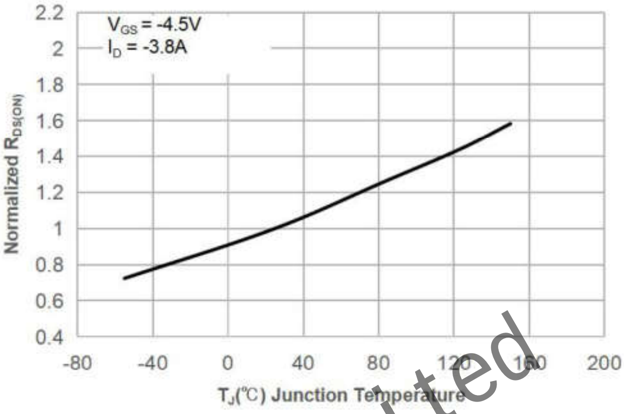


Figure 9: Maximum Safe Operating Area

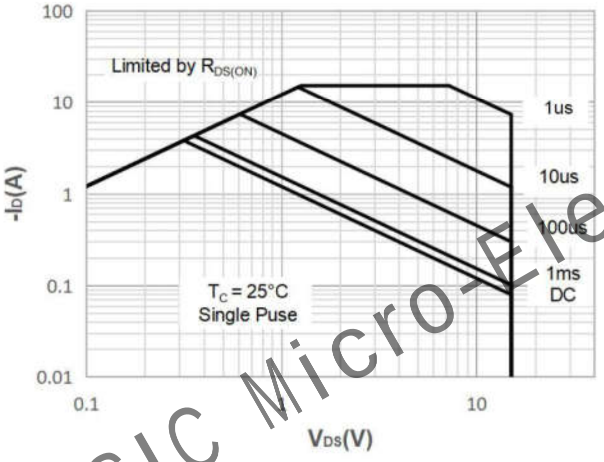


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

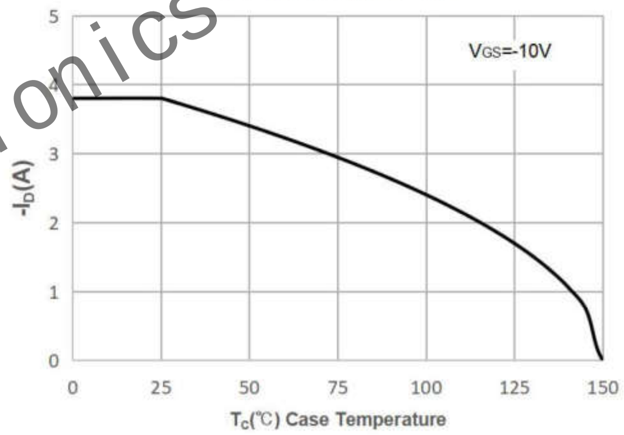


Figure 11: Normalized Maximum Transient Thermal Impedance

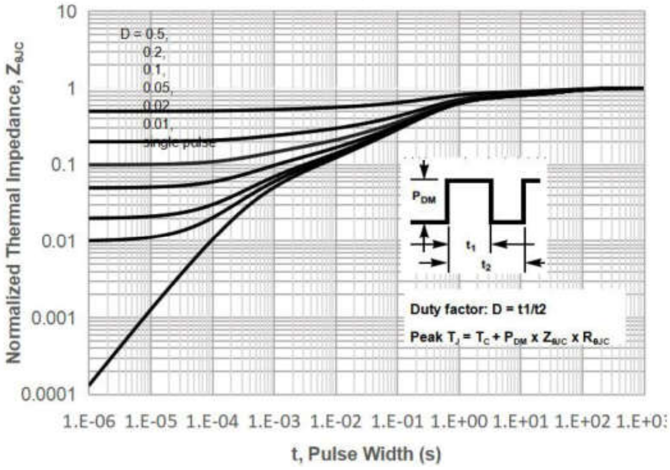
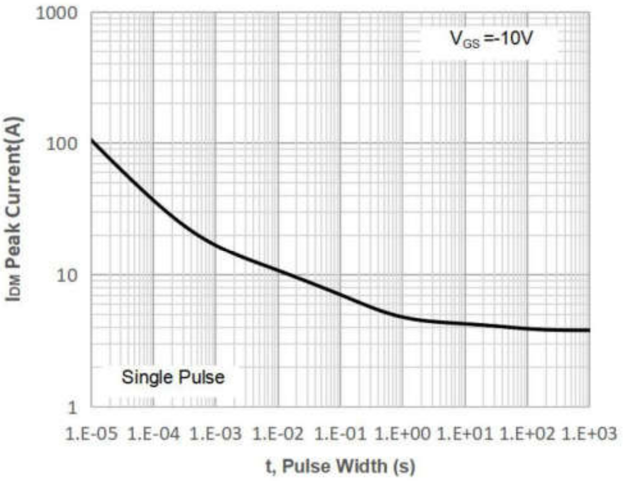


Figure 12: Peak Current Capacity



Dimension

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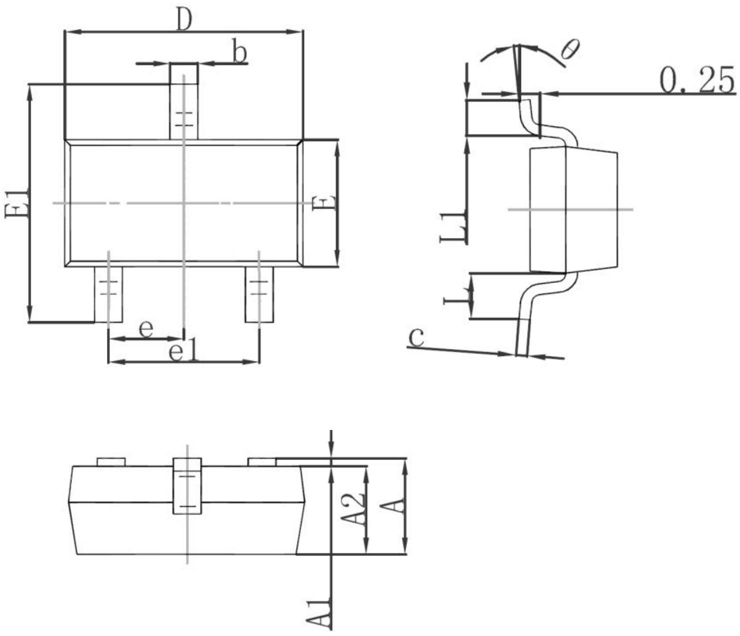
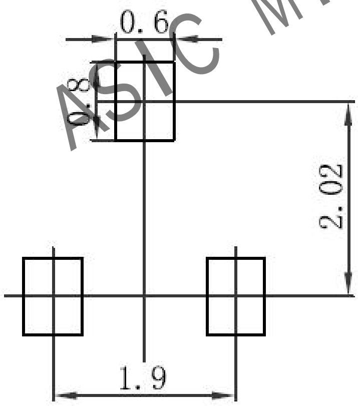


Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

Recommended Land Pattern



Note:

1. Controlling dimension: in millimeters
2. General tolerance: ±0.05mm
3. The pad layout is for reference only
4. Unit: mm