

## 1. Description

The DMG2301L-7(ES) is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent  $R_{DS(ON)}$  with low gate charge. Device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product DMG2301L-7(ES) is Pb-free.

## 2. Features

- -20V,  $R_{DS(ON)}=82m\Omega(TYP.) @V_{GS}=-4.5V$
- $R_{DS(ON)}=118m\Omega(TYP.) @V_{GS}=-2.5V$
- $R_{DS(ON)}=180m\Omega(TYP.) @V_{GS}=-1.8V$
- Fast Switching
- High density cell design for low  $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

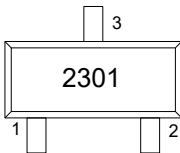
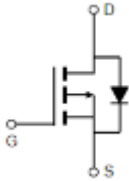
## 3. Applications

- PWM applications
- Load switch
- Power management in portable/desktop PCs
- DC/DC conversion

## 4. Ordering Information

Part Number	Package	Marking	Material	Packing	Quantity per reel	Flammability Rating	Reel Size
DMG2301L-7(ES)	SOT-23	2301	Halogen free	Tape & Reel	3,000 PCS	UL 94V-0	7 inches

## 5. Pin Configuration and Functions

Pin	Function	Outline	Circuit Diagram
1	Gate		
2	Source		
3	Drain		

## 6. Specification

### Absolute Maximum Rating & Thermal Characteristics

Ratings at 25 °C ambient temperature unless otherwise specified.

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$BV_{DSS}$	-20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current	$T_A=25^\circ\text{C}$	-2.0	A
	$T_A=100^\circ\text{C}$	-1.2	
Maximum Power Dissipation	$T_A=25^\circ\text{C}$	0.8	W
Pulsed Drain Current	$I_{DM}$	-8.1	A
Operating Junction Temperature	$T_J$	150	°C
Storage Temperature Range	$T_{stg}$	-55 to +150	°C

### Thermal resistance ratings

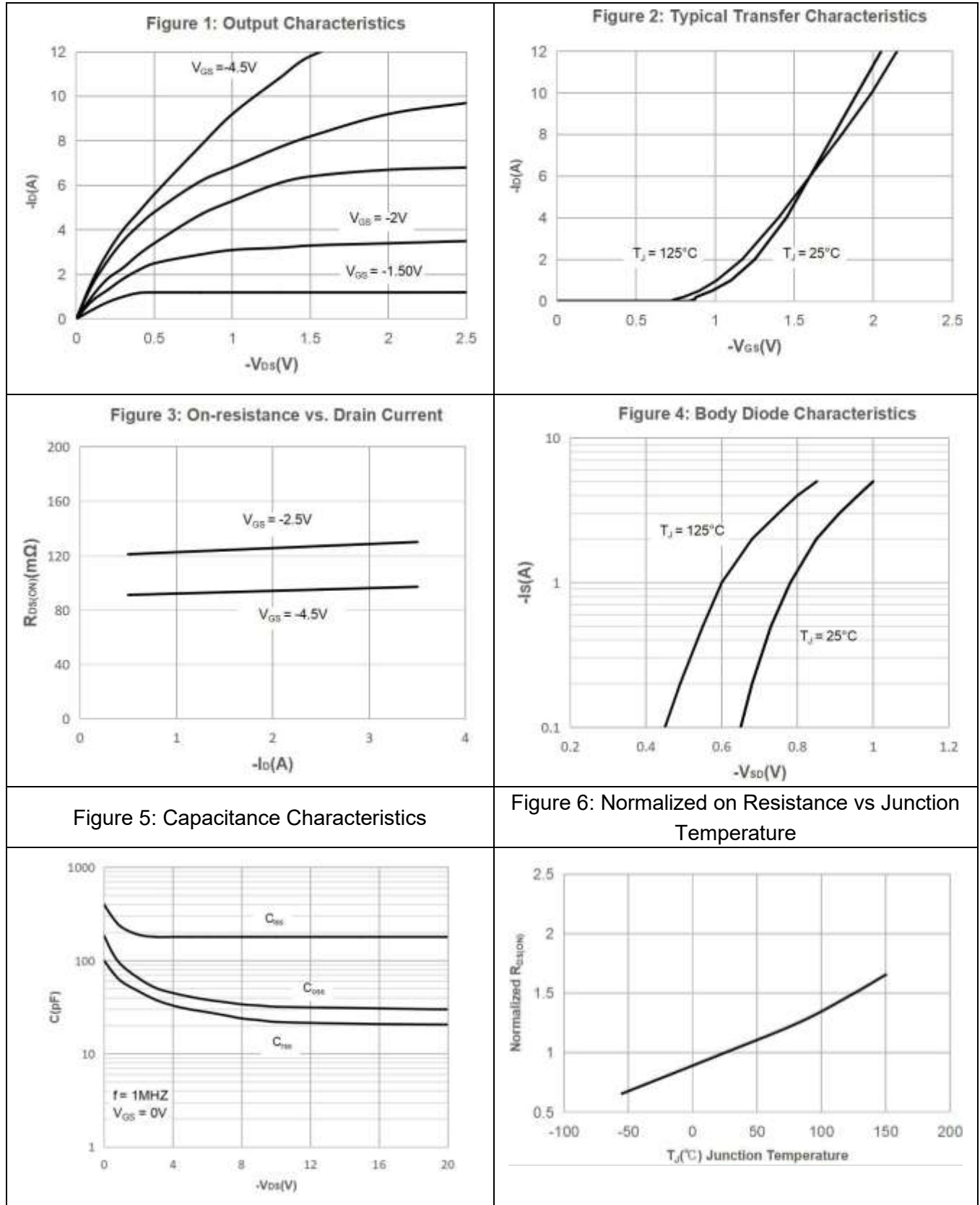
Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ( $t \leq 10\text{s}$ )	$R_{\theta JA}$		156	°C/W

## Electrical Characteristics

At TA = 25°C unless otherwise specified

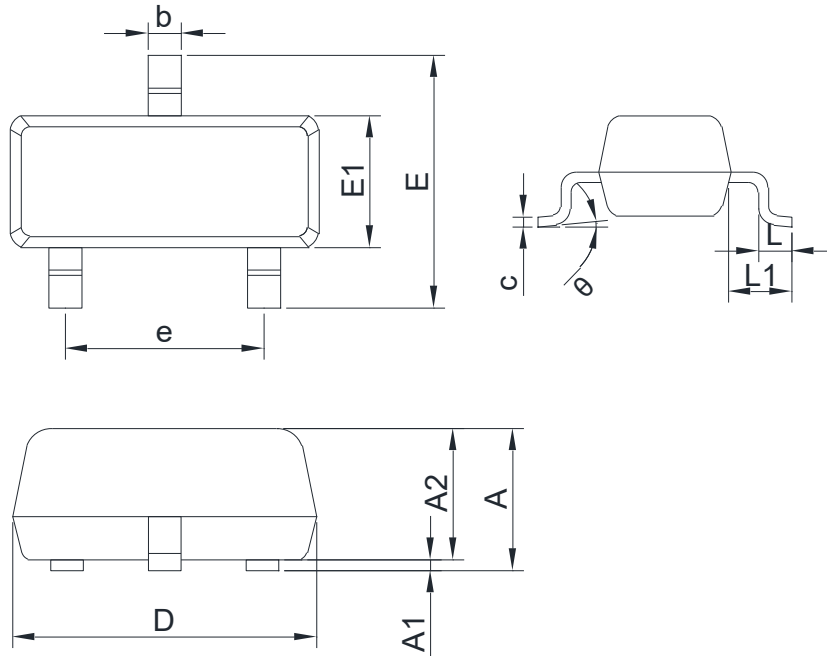
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-20			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-20V, V_{GS}=0V$			-1	$\mu A$
Gate-to-source Leakage Current	$I_{GSS}$	$V_{DS}=0V, V_{GS}=\pm 12V$			$\pm 100$	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.4	-0.62	-1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-2A$		82	115	m $\Omega$
		$V_{GS}=-2.5V, I_D=-1.5A$		118	160	
		$V_{GS}=-1.8V, I_D=-1A$		180	245	
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0V, V_{DS}=-10V$ $f=1MHz$		185		pF
Output Capacitance	$C_{OSS}$			35		
Reverse Transfer Capacitance	$C_{RSS}$			25		
Total Gate Charge	$Q_G$	$V_{GS}=-4.5V, V_{DS}=-10V$ $I_D=-2A$		2.2		nC
Gate-to-Source Charge	$Q_{GS}$			0.5		
Gate-to-Drain Charge	$Q_{GD}$			0.5		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=-4.5V, V_{DS}=-10V$ $R_L=5\Omega, R_G=3\Omega$		10		ns
Rise Time	$t_r$			30		
Turn-Off Delay Time	$t_{d(OFF)}$			62		
Fall Time	$t_f$			50		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-2A$			-1.5	V

## 7. Typical Characteristics



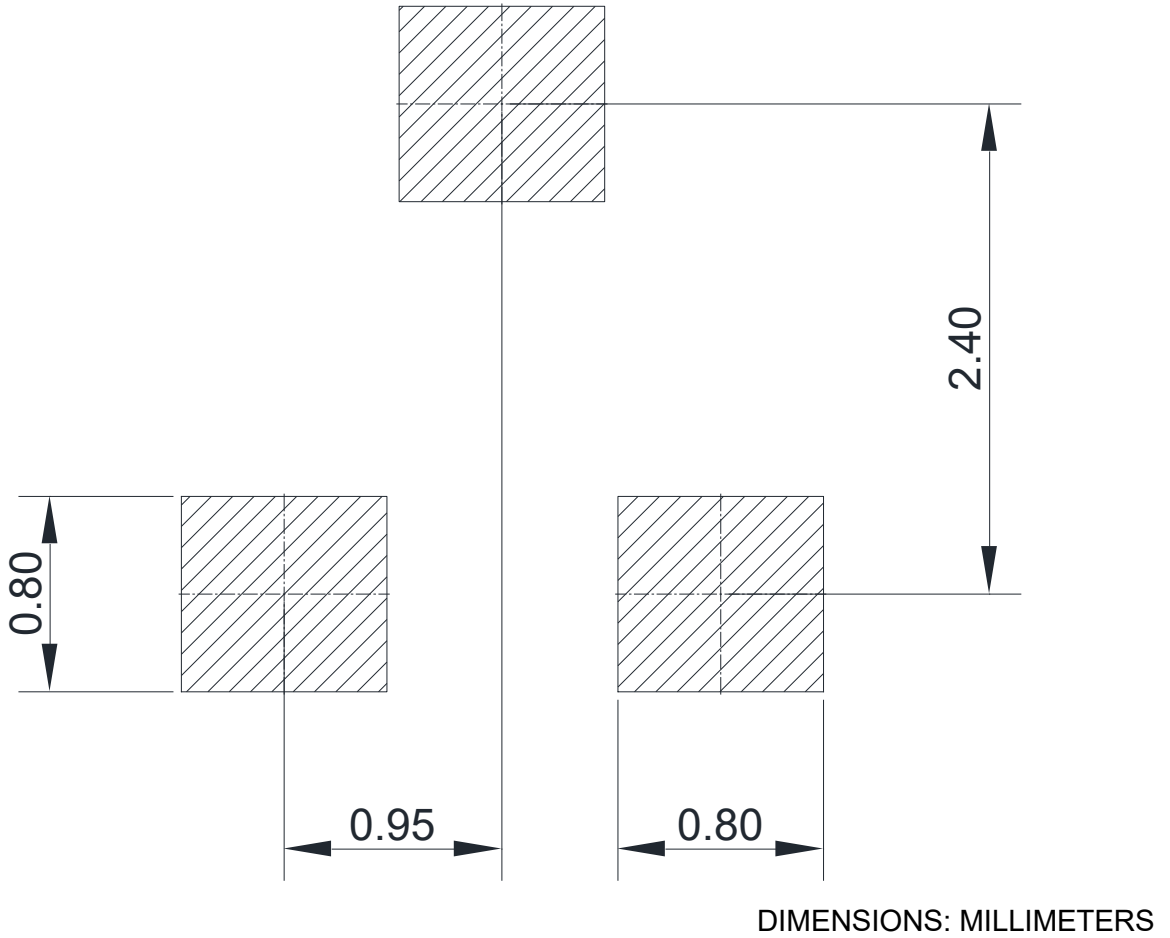
8. Dimension (SOT-23)

POD(Z)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	0.90	1.20	E	2.25	2.55
A1	0.00	0.10	E1	1.20	1.40
A2	0.90	1.10	e	1.80	2.00
b	0.30	0.50	L	0.30	0.50
c	0.07	0.18	L1	0.475	0.625
D	2.80	3.04	$\theta$	0°	8°

### 9. Recommended Soldering Footprint



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