

**SuperMOS – SOT-23 -20V  $V_{DSS}$ , 36m $\Omega$   $R_{DS(on)}$ , P-channel MOSFET**

**1. Description**

The SI2323DS-T1-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 SI2323DS-T1-ES is Pb-free.

**2. Features**

- -20V,  $R_{DS(ON)}=36m\Omega(TYP.) @V_{GS}=-4.5V$
- $R_{DS(ON)}=50m\Omega(TYP.) @V_{GS}=-2.5V$
- $R_{DS(ON)}=72m\Omega(TYP.) @V_{GS}=-1.8V$
- Fast Switching
- High density cell design for low  $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

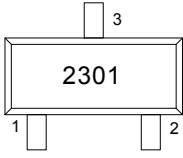
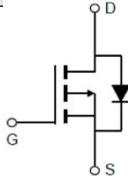
**3. Applications**

- 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
SI2323DS-T1-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	$I_D$	$T_A=25^\circ\text{C}$	-3.8	A
		$T_A=100^\circ\text{C}$	-2.3	
Maximum Power Dissipation	$P_D$	0.9	W	
Pulsed Drain Current	$I_{DM}$	-15.2	A	
Operating Junction Temperature	$T_J$	150	$^\circ\text{C}$	
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$	

#### Thermal resistance ratings

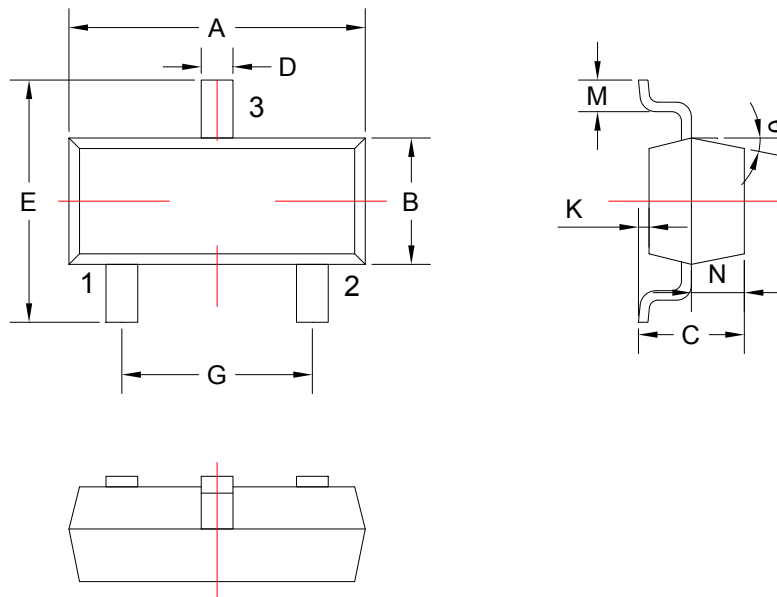
Single Operation				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ( $t \leq 10\text{s}$ )	$R_{\theta JA}$		139	$^\circ\text{C/W}$

## 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	$R_{DS(on)}$	$V_{GS}=-4.5V, I_D=-3.8A$		36	47	m $\Omega$
		$V_{GS}=-2.5A, I_D=-3A$		50	63	
		$V_{GS}=-1.8V, I_D=-2.5A$		72	90	
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	$C_{ISS}$	$V_{GS}=0V, V_{DS}=-10V$ $f=1MHz$		430		pF
Output Capacitance	$C_{OSS}$			65		
Reverse Transfer Capacitance	$C_{RSS}$			52		
Total Gate Charge	$Q_G$	$V_{GS}=-4.5V, V_{DS}=-10V$ $I_D=-3A$		4.3		nC
Gate-to-Source Charge	$Q_{GS}$			0.8		
Gate-to-Drain Charge	$Q_{GD}$			1.1		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_{d(ON)}$	$V_{GS}=-4.5V, V_{DS}=-10V$ $I_D=-3A, R_G=3\Omega$		12		ns
Rise Time	$t_r$			55		
Turn-Off Delay Time	$t_{d(OFF)}$			15		
Fall Time	$t_f$			9		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=-3.8A$			-1.5	V

7. Dimension (SOT-23)



COMMON DIMENSIONS CUNITS MEASURE=MILLIMETER					
SYMBOL	MIN	MAX	SYMBOL	MIN	MAX
A	2.85	3.04	G	1.80	2.00
B	1.20	1.40	K	0	0.10
C	0.90	1.10	M	0.20	-
D	0.40	0.50	N	0.50	0.70
E	2.25	2.55	θ	5°	9°

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