1.Description

The SI2356DS-T1-GE3(ES) is N-Channel enhancement MOS Field Effect Transistor. Using 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 SI2356DS-T1-GE3(ES) is Pb-free.

2.Features

- 40V, $R_{DS(ON)}$=35mΩ(TYP.) @V_{GS}=10V
  $R_{DS(ON)}$=46mΩ(TYP.) @V_{GS}=4.5V
- High density cell design for low $R_{DS(on)}$
- Material: Halogen free
- Reliable and rugged
- Avalanche Rated
- Low leakage current

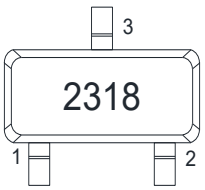
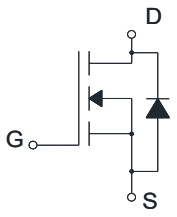
3.Applications

- 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
SI2356DS-T1-GE3(ES)	SOT-23	2318	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		

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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}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	4	A
	T_C=100°C		2.4	
Maximum Power Dissipation		P_D	1.25	W
Pulsed Drain Current		I_{DM}	16	A
Operating Junction Temperature		T_J	-55 to 150	°C
Lead Temperature		T_L	260	°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	$R_{\theta JA}$		100	°C/W

Electrical Characteristics

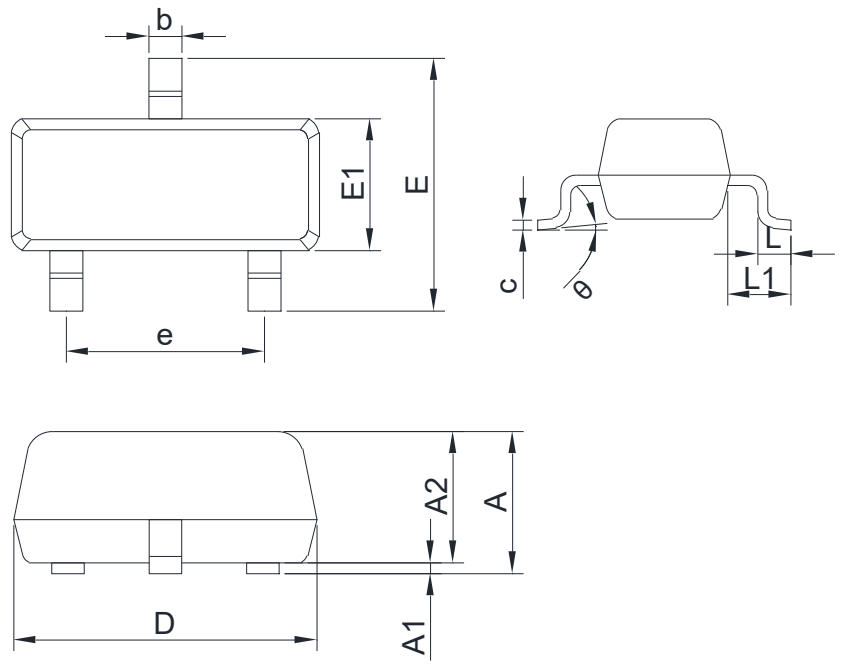
At TA = 25℃ unless otherwise specified

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=40V, V_{GS}=0V			1.0	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS}=V_{DS}, I_D=250uA	1.0	1.5	2.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=3A		35	46	mΩ
		V_{GS}=4.5V, I_D=2A		46	60	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V, f=1MHz, V_{DS}=20V		404		pF
Output Capacitance	C_{OSS}			33		
Reverse Transfer Capacitance	C_{RSS}			26		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=0 to 10V, V_{DS}=20V, I_D=3A		8.4		nC
Gate-to-Source Charge	Q_{GS}			1.62		
Gate-to-Drain Charge	Q_{GD}			1.37		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_{d(ON)}$	V_{GS}=10V, V_{DD}=20V, I_D=3A, R_{GEN}=3.3Ω		7		ns
Rise Time	t_r			3.5		
Turn-Off Delay Time	$t_{d(OFF)}$			6.8		
Fall Time	t_f			1.5		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS}=0V, I_S=3A			1.2	V

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7. Dimension (SOT-23)

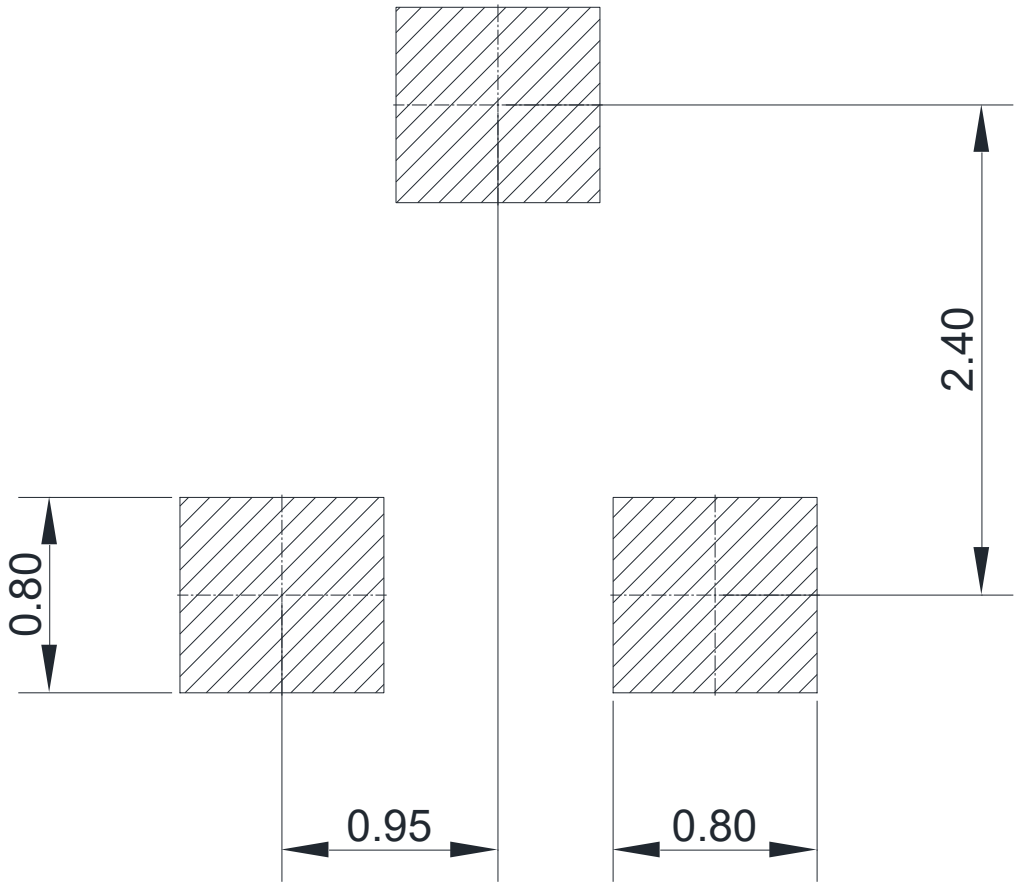
POD(Z)



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	θ	0°	8°

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8. Recommended Soldering Footprint



DIMENSIONS: MILLIMETERS

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