

30V,5.8A N-Channel Power MOSFET

GENERAL DESCRIPTION

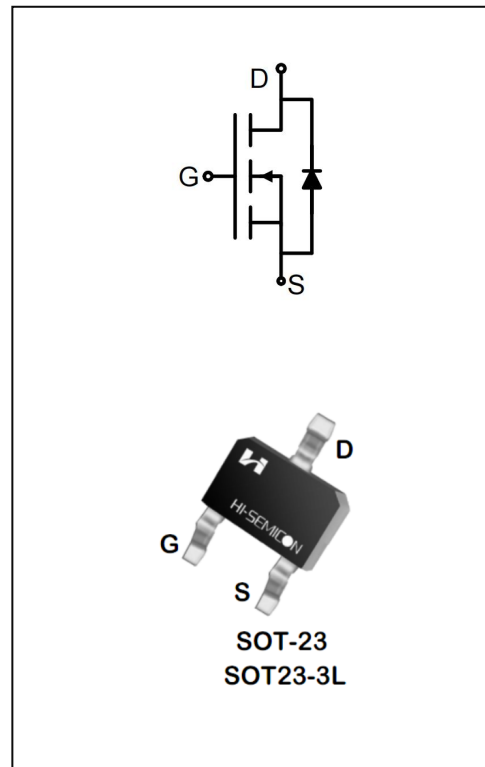
The SFS3400 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.

Features

- ◆ $V_{DS}=30V, I_D=5.8A$
- ◆ $R_{DS(ON)}$
 - TYP:23mΩ@ $V_{GS}= 10V, I_D= 5.0A$
 - TYP:26mΩ@ $V_{GS}= 4.5V, I_D= 5.0A$
 - TYP:39mΩ@ $V_{GS}= 2.5V, I_D= 4.0A$

Applications

- ◆ Power faction correction (PFC)
- ◆ Switched mode power supplies (SMPS)
- ◆ Uninterruptible power supply (UPS)
- ◆ LED lighting power



ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
SFS3400	SOT23-3L/SOT-23	3400	Pb Free	Reel

ABSOLUTE MAXIMUM RATINGS (T_J=25°C unless otherwise noted)

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltage		V _{DS}	30	V
Gate-Source Voltage		V _{GS}	±12	V
Drain Current	T _C = 25°C	I _D	5.8	A
	T _C = 75°C		4.5	
Drain Current Pulsed(Note 1)		I _{DM}	30	A
Power Dissipation(T _C =25°C) -Derate above 25°C		P _D	1.4	W
Operation Junction Temperature Range		T _J	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		TL	300	°C

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain -Source Breakdown Voltage	B _{VDS}	V _{GS} = 0V, I _D = 250μA	30	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V	--	--	1	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = 12V, V _{DS} = 0V	--	--	100	nA
Gate-Source Leakage Current	I _{GSS}	V _{GS} = -12V, V _{DS} = 0V	--	--	-100	
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _D = 250μA	0.5	0.9	1.4	V
Static Drain- Source On State Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 5.0A	--	23	28	mΩ
		V _{GS} = 4.5V, I _D = 5.0A	--	26	33	
		V _{GS} = 2.5V, I _D = 4.0A	--	39	46	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 15V V _{GS} = 0V f=1.0MHZ	--	825	--	pF
Output Capacitance	C _{oss}		--	96	--	
Reverse Transfer Capacitance	C _{rss}		--	75	--	
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V, V _{GS} = 10V R _G = 3Ω, I _D = 3.0A (Note 2.3)	--	4.5	--	nS
Turn-on Rise Time	t _r		--	4.0	--	
Turn-off Delay Time	t _{d(off)}		--	24.5	--	
Turn-off Fall Time	t _f		--	3.8	--	
Total Gate Charge	Q _g	V _{DS} =15V, I _D =5.8A V _{GS} =4.5V	--	9.5	--	nC
Gate-Source Charge	Q _{gs}		--	1.3	--	
Gate-Drain Charge	Q _{gd}		--	3.2	--	

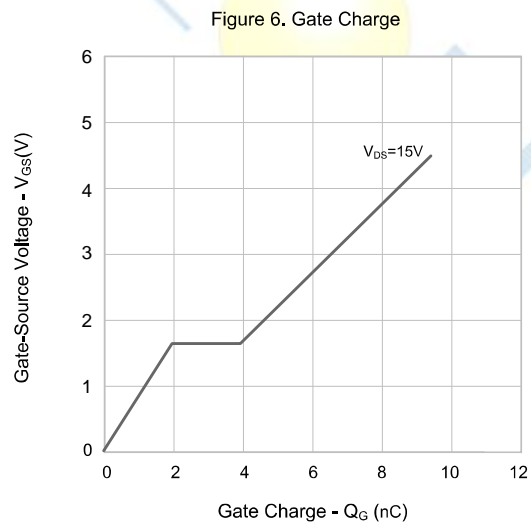
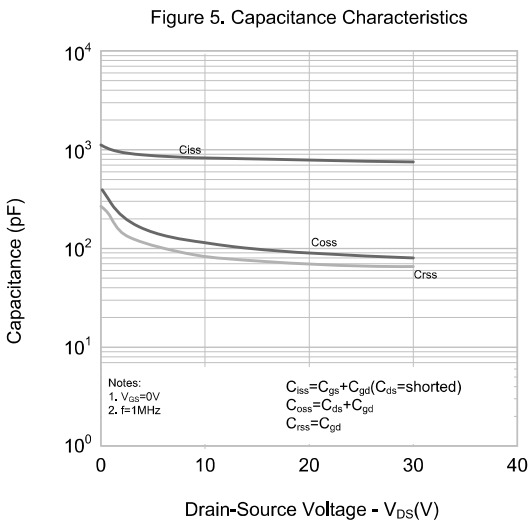
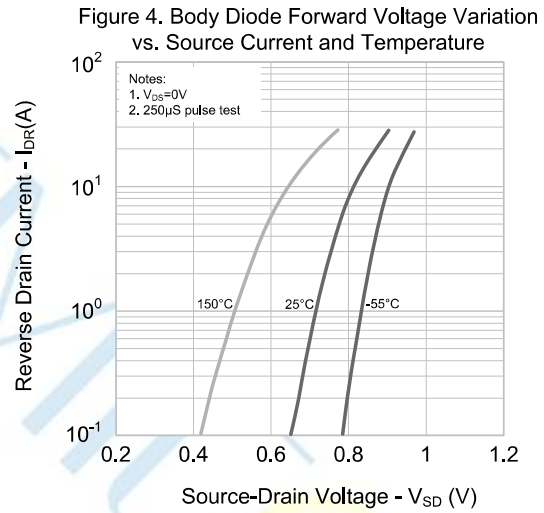
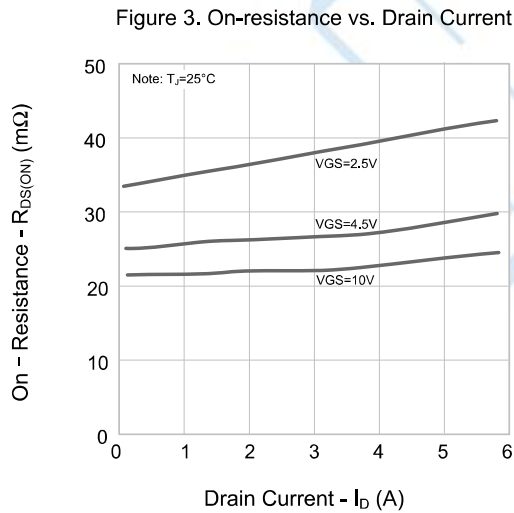
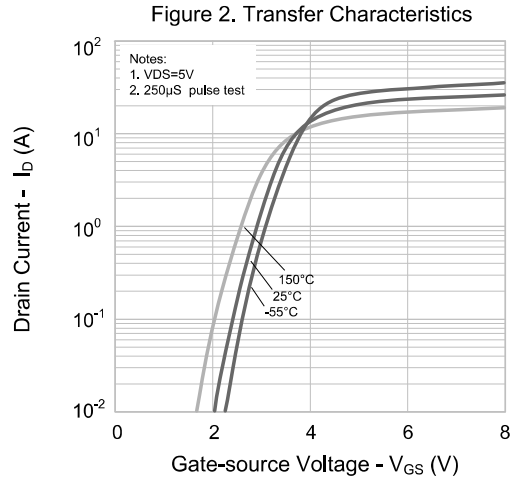
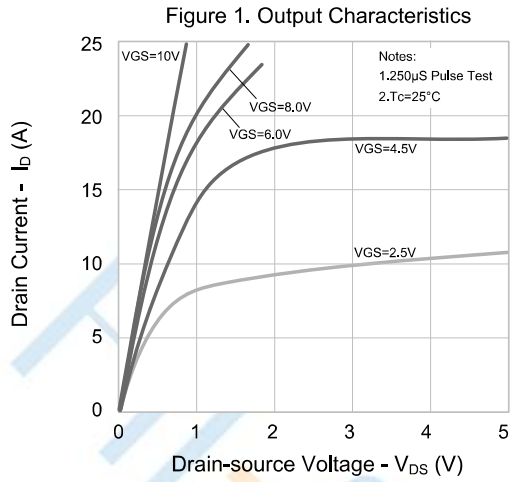
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Continuous Source Current	I_S	Integral Reverse P-N Junction Diode in the MOSFET	--	--	5.8	A
Pulsed Source Current	I_{SM}		--	--	30	
Forward Transconductance	g_{FS}	$V_{DS} = 5V, I_D = 2.9A$	10	--	--	S
Diode Forward Voltage	V_{SD}	$I_S = 2.5A, V_{GS} = 0V$	--	0.8	-1.2	V

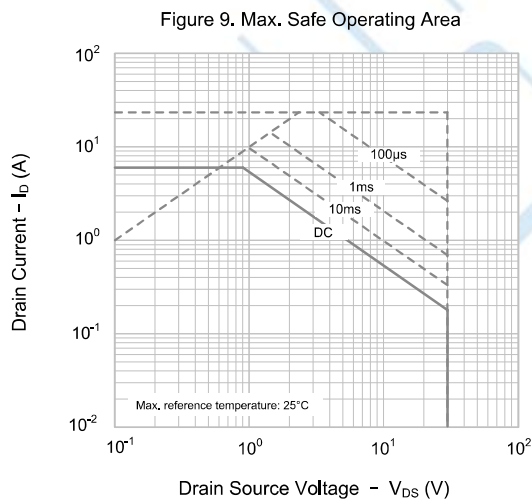
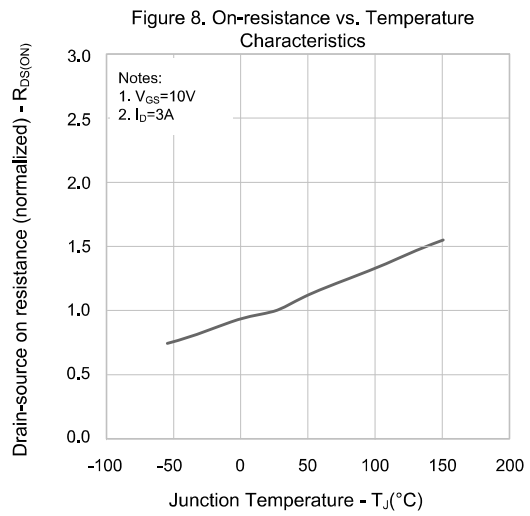
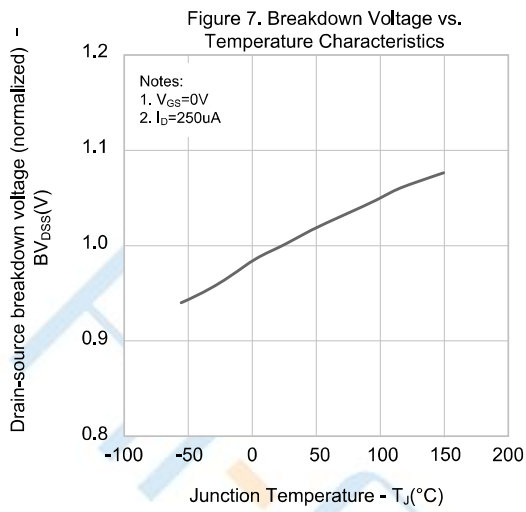
NOTE:

- 1.Pulse width limited by maximum junction temperature
- 2.Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
- 3.Essentially independent of operating temperature

Typical Performance Characteristics

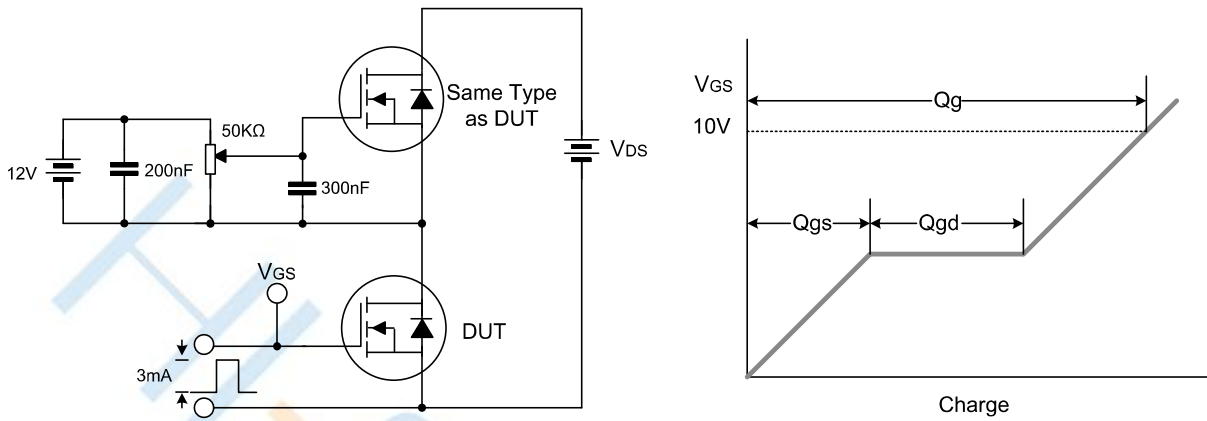


Typical Performance Characteristics

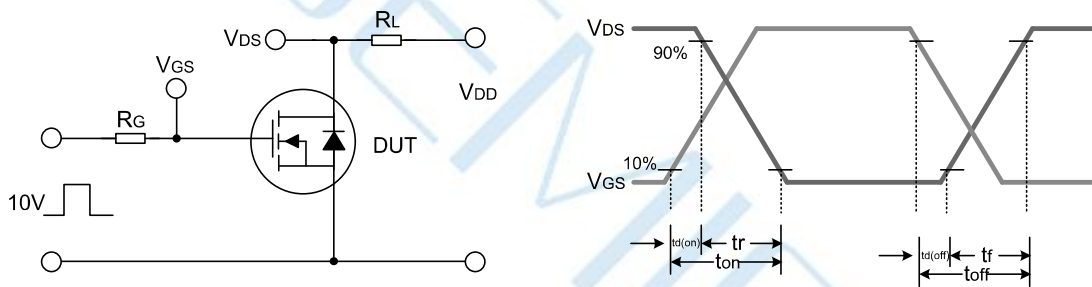


Test Circuit

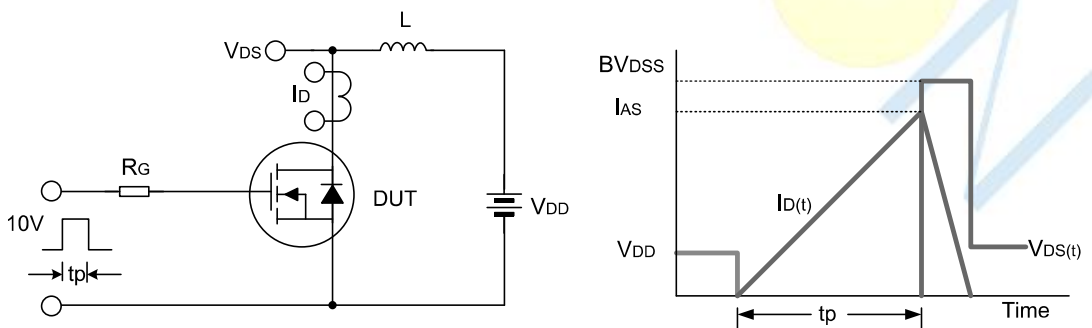
Gate Charge Test Circuit & Waveform



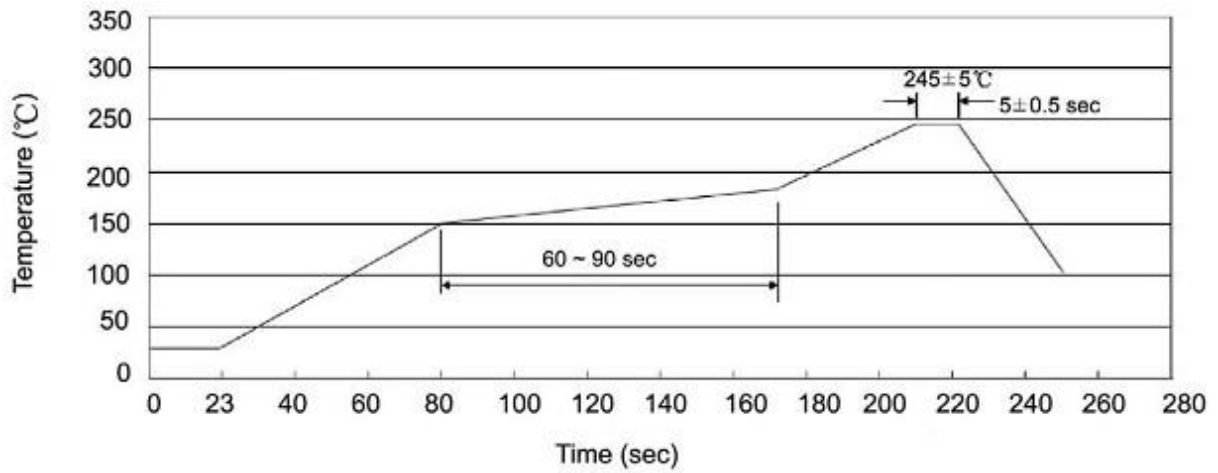
Resistive Switching Test Circuit & Waveform



Unclamped Inductive Switching Test Circuit & Waveform



Temperature Profile for IR Reflow Soldering(Pb-Free)

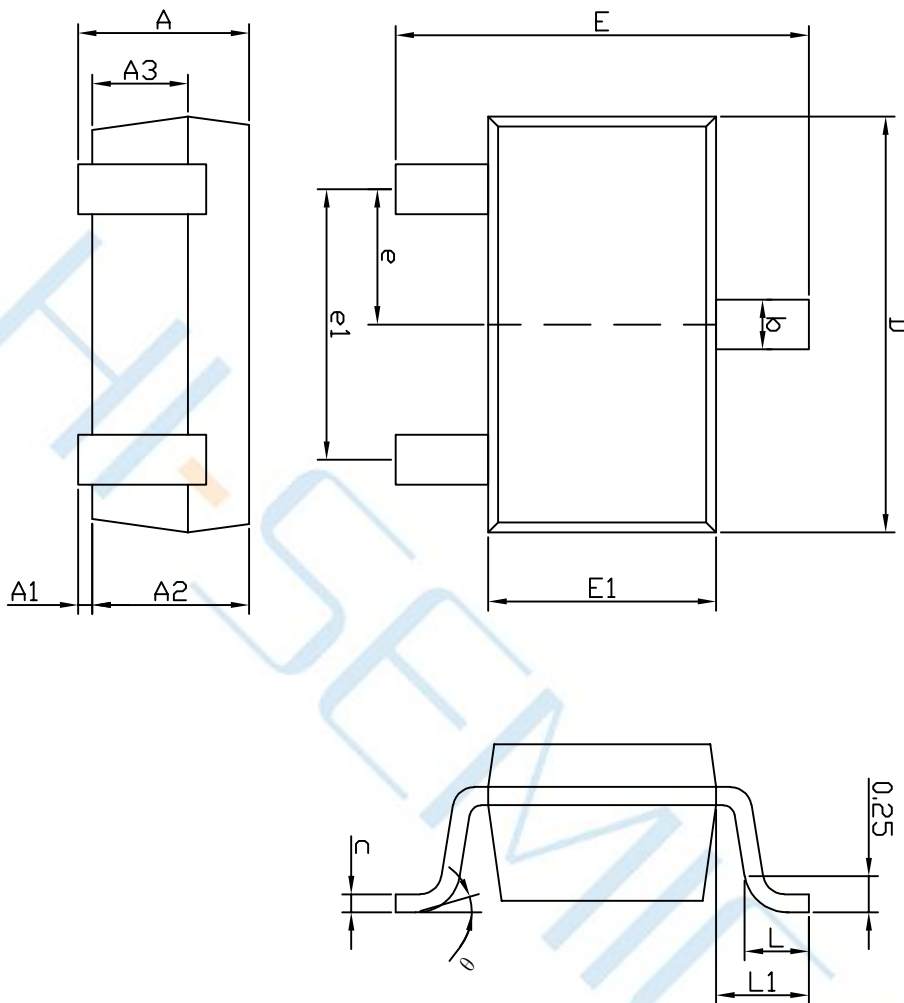


NOTE:

- 1.Preheating: 25-150°C, Time: 60-90sec
- 2.Peak Temp: 245±5°C, Duration: 5±0.5sec
- 3.Cooling Speed: 2-10°C/sec

Package Dimensions of SOT23-3L

Unit:mm

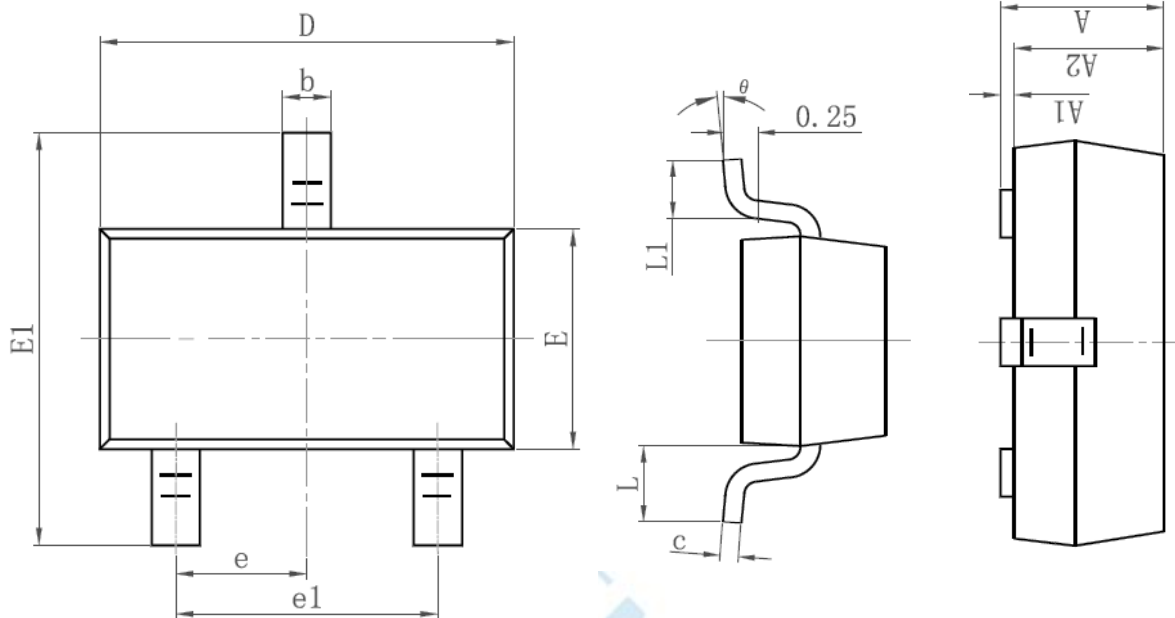


COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	-	-	1.25
A1	0.04	-	0.10
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.33	-	0.41
c	0.11	-	0.20
D	2.82	2.92	3.02
E	2.60	2.80	3.00
E1	1.50	1.60	1.70
e	0.95BSC		
e1	1.90BSC		
L	0.30	-	0.60
L1	0.60REF		
θ	0°	-	8°

Package Dimensions of SOT-23

Unit:mm



Symbol	Dimensions in Millimeters	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

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