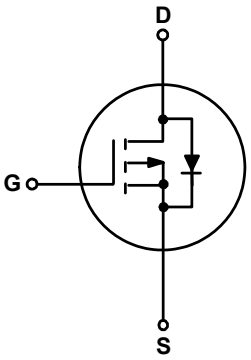
迈拓电子
MAITUO ELECTRONIC

MT1P10S **P-Channel Enhancement Mode MOSFET**



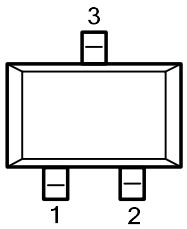
1. Product Information

1.1 Features

- ☑ **Surface-mounted package**
- ☑ **Advanced trench cell design**

1.2 Applications

- ☑ **Portable appliances**
- ☑ **High speed switch**
- ☑ **Battery management**
- ☑ **Low power DC to DC Converter**



Top View
SOT23

1.3 Quick reference

- ☑ **BV ≦ - 100 V**
- ☑ **P_{tot} ≦ 0.83 W**
- ☑ **I_D ≦ - 1.1 A**
- ☑ **$R_{DS(ON)}$ ≦ 600 mΩ @ V_{GS} = - 10 V**
  $R_{DS(ON)}$ ≦ 650 mΩ @ V_{GS} = - 4.5 V

Marking : 1P10

2. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
V_{DS}	Drain-Source Voltage	T_A = 25 ℃	- 100	-	V
V_{GS}	Gate-Source Voltage	T_A = 25 ℃	-	± 20	V
I_D*	Drain Current	T_A = 25 ℃, V_{GS} = - 10 V	-	- 1.1	A
		T_A = 100 ℃, V_{GS} = - 10 V	-	- 0.73	A
I_{DM}*,**	Pulsed Drain Current	T_A = 25 ℃, V_{GS} = - 10 V	-	- 4.4	A
P_{tot}	Total Power Dissipation	T_A = 25 ℃	-	0.83	W
T_{stg}	Storage Temperature		- 55	150	℃
T_J	Junction Temperature		- 55	150	℃
I_S	Diode Forward Current	T_A = 25 ℃	-	- 1.1	A
$R_{\theta JA}$*	Thermal Resistance- Junction to Ambient		-	150	℃ / W

Notes :

* Surface Mounted on 1 in^2 pad area, t ≤ 10 sec

** Pulse width ≤ 300 μs, duty cycle ≤ 2 %

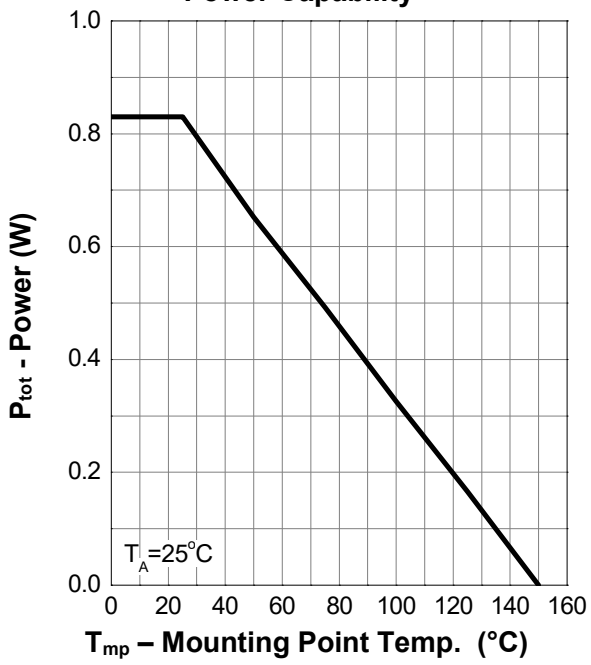
3. Electrical Characteristics (T_A = 25 °C Unless Otherwise Noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS} = 0 V, I_{DS} = - 250 µA	- 100	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_{DS} = - 250 µA	- 1	-	- 2.5	V
I_{DSS}	Drain Leakage Current	V_{DS} = - 80 V, V_{GS} = 0 V	-	-	- 1	µA
		T_J = 85 ℃	-	-	- 30	µA
I_{GSS}	Gate Leakage Current	V_{GS} = ± 20 V, V_{DS} = 0 V	-	-	± 100	nA
$R_{DS(ON)}$[a]	On-State Resistance	V_{GS} = - 10 V, I_{DS} = - 1 A	-	500	600	mΩ
		V_{GS} = - 4.5 V, I_{DS} = - 0.5 A	-	600	650	
Diode Characteristics						
V_{SD}[a]	Diode Forward Voltage	I_{SD} = - 1 A, V_{GS} = 0 V	-	-	- 1.3	V
t_{rr}	Reverse Recovery Time	I_{SD} = - 1 A, dI_{SD}/dt = 100 A/µs	-	21	-	nS
Q_{rr}	Reverse Recovery Charge		-	17	-	nC
Dynamic Characteristics[b]						
C_{iss}	Input Capacitance	V_{GS} = 0 V, V_{DS} = -50 V Frequency = 1 MHz	-	363	-	pF
C_{oss}	Output Capacitance		-	16	-	
C_{rss}	Reverse Transfer Capacitance		-	1	-	
t_d(on)	Turn-on Delay Time	V_{DS} = - 50 V, V_{GEN} = - 10 V, R_G = 4.5 Ω, R_L = 50 Ω, I_{DS} = - 1 A	-	6.8	-	nS
t_r	Turn-on Rise Time		-	20	-	
t_d(off)	Turn-off Delay Time		-	145	-	
t_f	Turn-off Fall Time		-	48	-	
Gate Charge Characteristics[b]						
Q_g	Total Gate Charge	V_{GS} = - 10 V, V_{DS} = - 50 V, I_{DS} = - 1 A	-	18		nC
Q_{gs}	Gate-Source Charge		-	3.5		
Q_{gd}	Gate-Drain Charge		-	2.2		

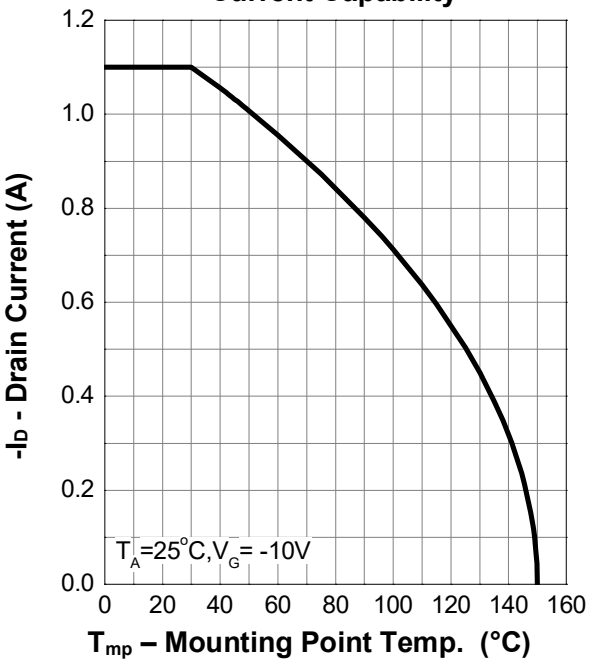
Notes： a : Pulse test ; pulse width ≤ 300 µs, duty cycle ≤ 2 %
b : Guaranteed by design, not subject to production testing

. Typical Characteristics

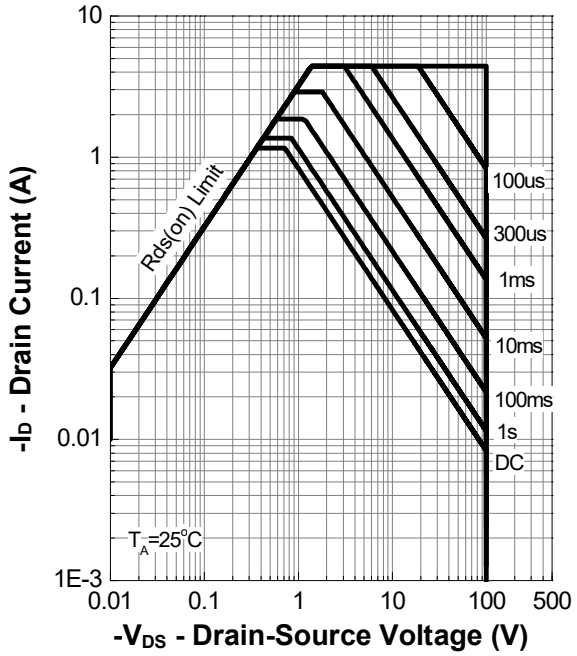
Power Capability



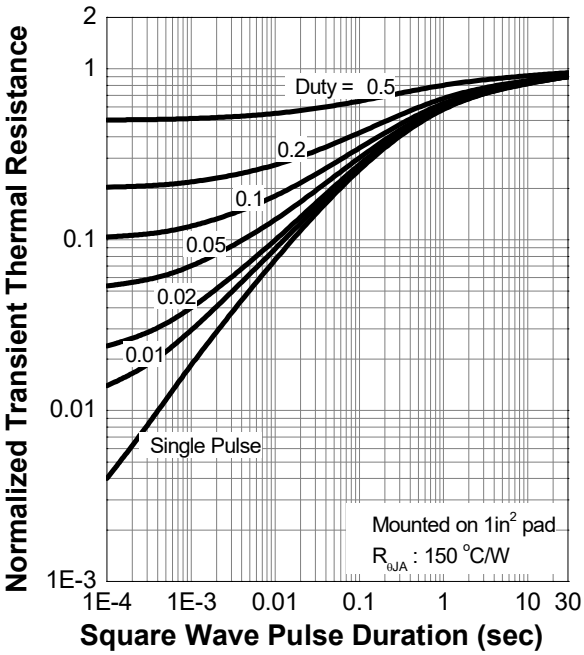
Current Capability

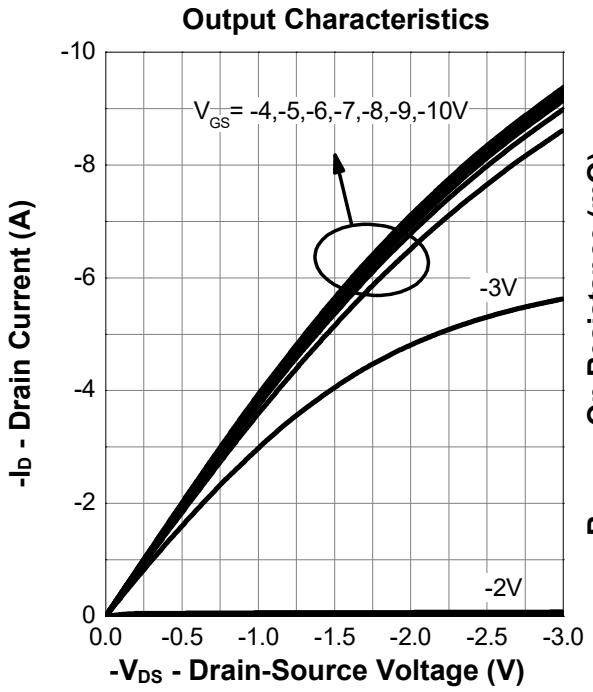


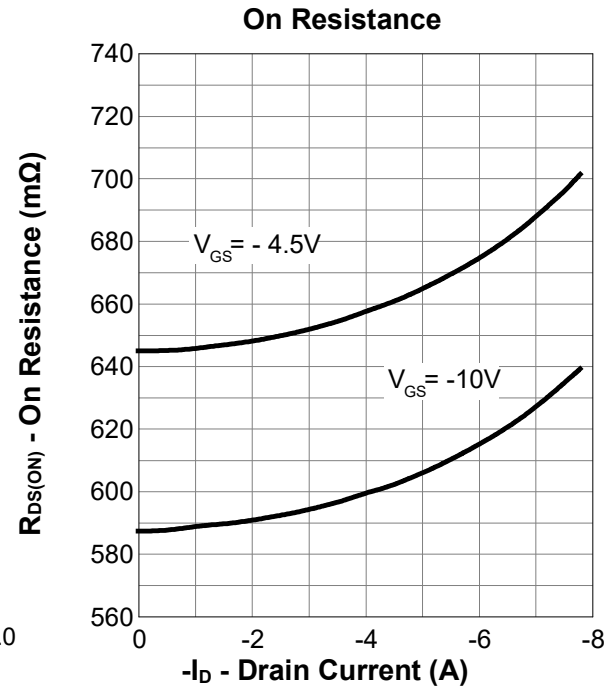
Safe Operation Area

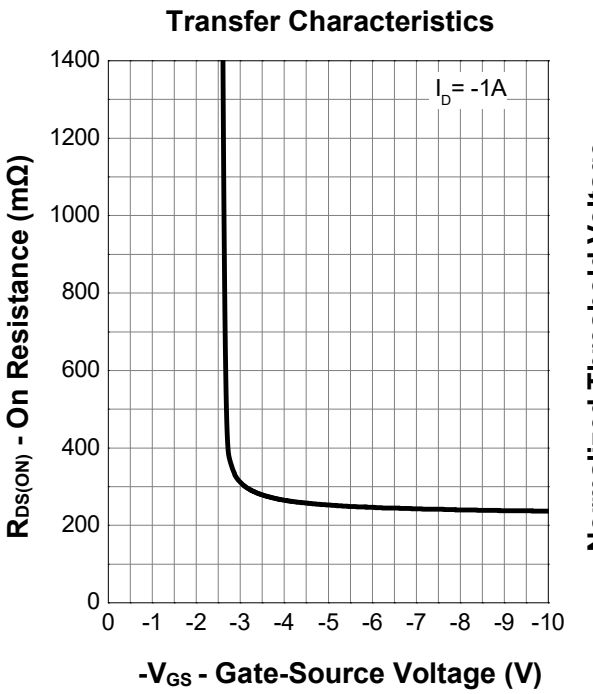


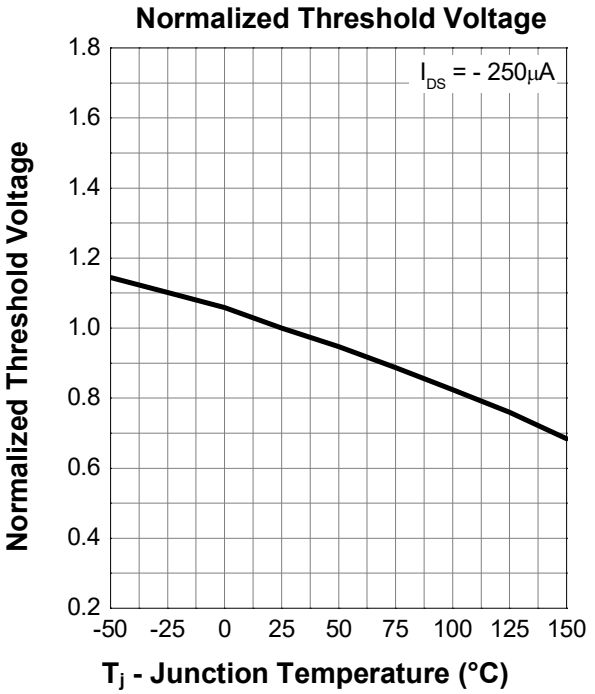
Transient Thermal Impedance

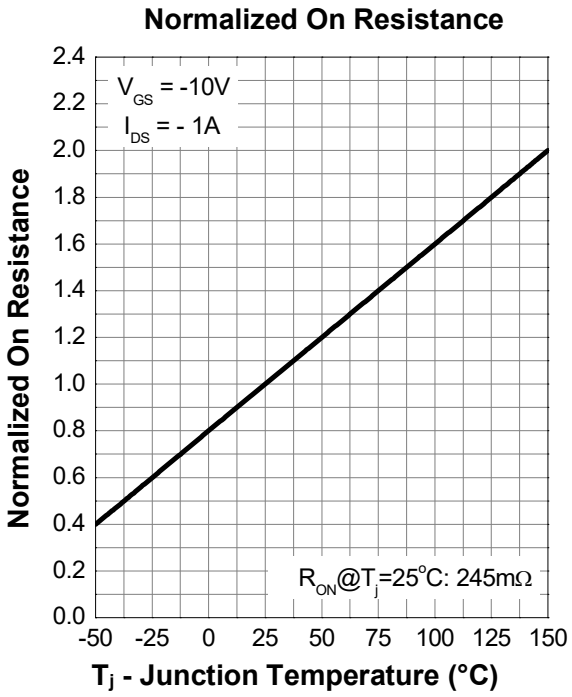


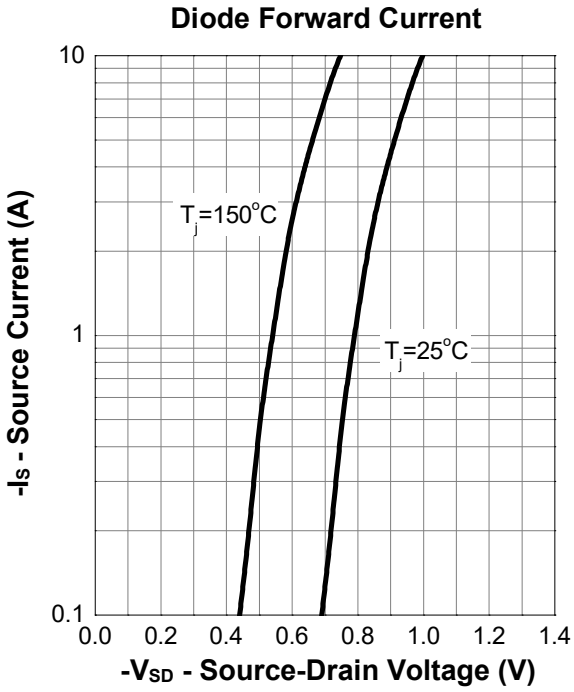

Output Characteristics
-10
-8
-6
-4
-2
0
0.0
-0.5
-1.0
-1.5
-2.0
-2.5
-3.0
V_{GS}= -4,-5,-6,-7,-8,-9,-10V
-3V
-2V
$-I_D$ - Drain Current (A)
$-V_{DS}$ - Drain-Source Voltage (V)

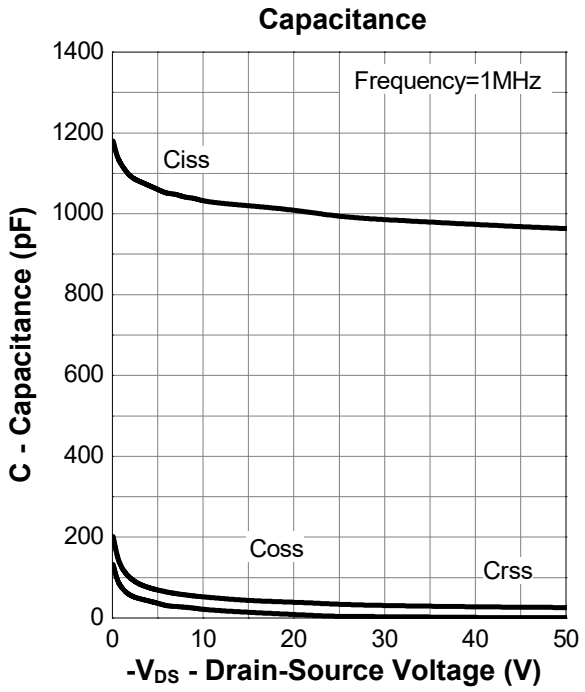

On Resistance
740
720
700
680
660
640
620
600
580
560
0
-2
-4
-6
-8
V_{GS}= - 4.5V
V_{GS}= -10V
$R_{DS(ON)}$ - On Resistance (mΩ)
$-I_D$ - Drain Current (A)

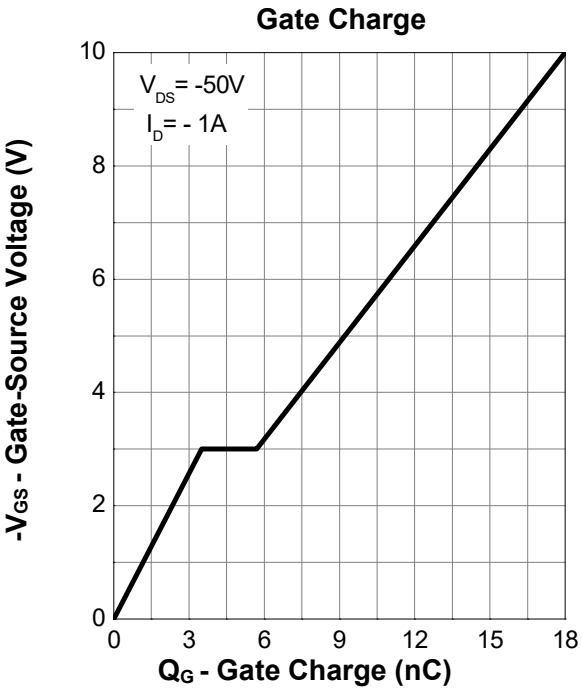

Transfer Characteristics
1400
1200
1000
800
600
400
200
0
0
-1
-2
-3
-4
-5
-6
-7
-8
-9
-10
I_D= -1A
$R_{DS(ON)}$ - On Resistance (mΩ)
$-V_{GS}$ - Gate-Source Voltage (V)


Normalized Threshold Voltage
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
-50
-25
0
25
50
75
100
125
150
I_{DS} = - 250μA
Normalized Threshold Voltage
T_j - Junction Temperature (°C)


Normalized On Resistance
V_{GS} = -10V
I_{DS} = - 1A
R_{ON}@T_j=25°C: 245mΩ
Normalized On Resistance
T_j - Junction Temperature (°C)


Diode Forward Current
T_j=150°C
T_j=25°C
$-I_S$ - Source Current (A)
$-V_{SD}$ - Source-Drain Voltage (V)


Capacitance
Frequency=1MHz
Ciss
Coss
Crss
C - Capacitance (pF)
$-V_{DS}$ - Drain-Source Voltage (V)


Gate Charge
V_{DS} = -50V
I_D = - 1A
$-V_{GS}$ - Gate-Source Voltage (V)
Q_G - Gate Charge (nC)

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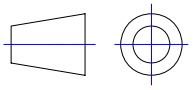
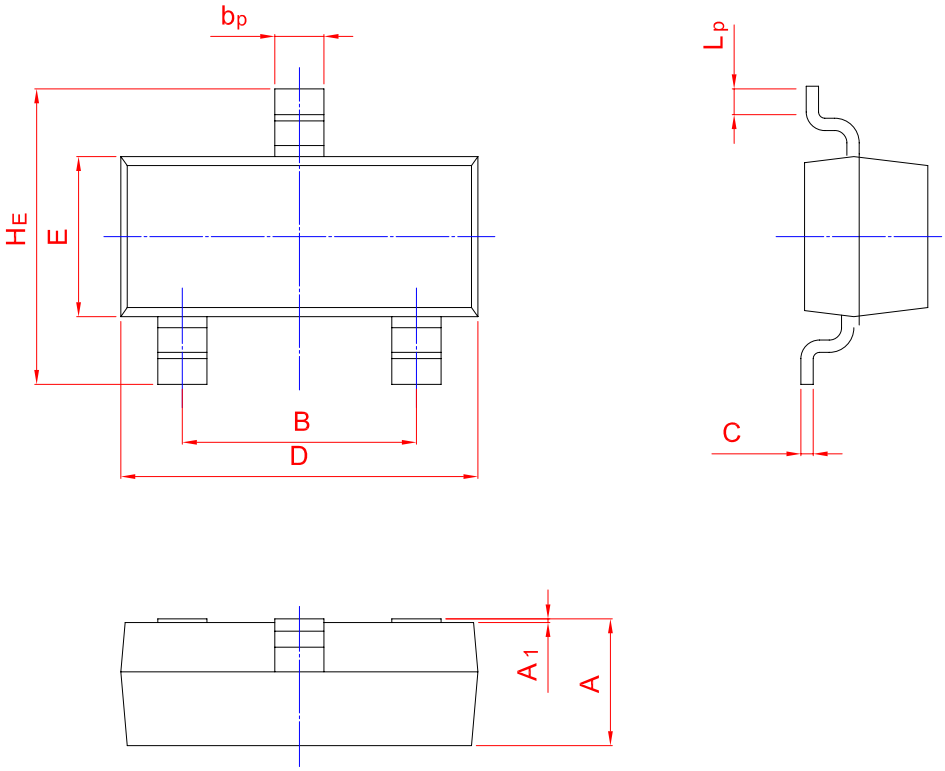
PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT-23**





UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20