

Advanced P-Ch Trench MOSFET

PORTABLE EQUIPMENT APPLICATION

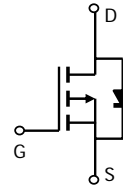
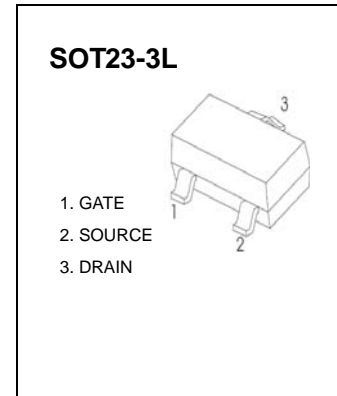
PIN Connection

Features

- Low Voltage : $BV_{DSS} = -20V$ (Min.)
- Low $V_{GS(th)}$: $V_{GS(th)} = -0.6 \sim -1.4V$
- Small footprint due to small package
- Low $R_{DS(on)}$: $R_{DS(on)} = 88m\Omega$ (Max.)

Ordering Information

Type No.	Marking	Package Code
BCJ001	J001	SOT23-3L



Absolute maximum ratings ($T_A = 25^\circ C$ unless otherwise noted)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	-20	V
Gate-source voltage	V_{GSS}	± 12	V
Drain current (DC) *	I_D	-2.3	A
Drain current (Pulsed) *	I_{DM}	-9.2	A
Power dissipation **	P_D	0.35	W
Avalanche current (Single) ②	I_{AS}	-2.3	A
Single pulsed avalanche energy ②	E_{AS}	28	mJ
Avalanche current (Repetitive) ①	I_{AR}	-2.3	A
Repetitive avalanche energy ①	E_{AR}	1.3	mJ
Junction temperature	T_J	150	°C
Storage temperature range	T_{stg}	-55~150	

* Limited by maximum junction temperature

** Device mounted on a glass-epoxy board

Characteristic	Symbol	Typ.	Max.	Unit
Thermal resistance Junction-ambient	$R_{th(J-A)}$	-	357	°C/W

Electrical Characteristics (T_A=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit	
Drain-source breakdown voltage	BV _{DSS}	I _D =-250μA, V _{GS} =0	-20	-	-	V	
Gate threshold voltage	V _{GS(th)}	I _D =-250μA, V _{DS} =V _{GS}	-0.6	-	-1.4	V	
Drain-source cut-off current	I _{DSS}	V _{DS} =-20V, V _{GS} =0	-	-	1	μA	
Gate leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±12V	-	-	±100	nA	
Drain-source on-resistance ④	R _{DS(on)}	V _{GS} =-5.0V, I _D =-1.2A	-	64	88	mΩ	
		V _{GS} =-2.5V, I _D =-1.2A	-	72	93		
Forward transfer conductance ④	g _{fs}	V _{DS} =-5V, I _D =-2.3A	-	15	-	S	
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =-10V, f=1MHz	-	880	1320	pF	
Output capacitance	C _{oss}		-	210	320		
Reverse transfer capacitance	C _{rss}		-	110	170		
Turn-on delay time	t _{d(on)}	V _{DD} =-10V, I _D =-2.3A R _G =10Ω	-	5.2	-	ns	
Rise time	t _r		-	10	-		
Turn-off delay time	t _{d(off)}		③④	-	17.6		-
Fall time	t _f		-	10	-		
Total gate charge	Q _g	V _{DD} =-10V, V _{GS} =-5V I _D =-2.3A	-	8.0	12	nC	
Gate-source charge	Q _{gs}		③④	-	1.3		2.0
Gate-drain charge	Q _{gd}		③④	-	2.3		3.5

Source-Drain Diode Ratings and Characteristics (T_A=25°C unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Continuous source current	I _S	Integral reverse diode in the MOSFET	-	-	-0.4	A
Source current (Pulsed) ①	I _{SM}		-	-	-1.6	
Forward voltage ④	V _{SD}	V _{GS} =0V, I _S =-0.4A	-	-0.9	-1.3	V
Reverse recovery time	t _{rr}	I _S =-0.4A, V _{GS} =0V dI _F /dt=10A/μs	-	73	-	ns
Reverse recovery charge	Q _{rr}		-	250	-	μC

Note ;

① Repetitive Rating : Pulse Width Limited by Maximum Junction Temperature

② L=2.0mH, I_{AS}=-2.3A, V_{DD}=10V, R_G=25Ω

④ Essentially independent of operating temperature

③ Pulse Test : Pulse width≤300μs, Duty cycle≤2%

P-CH Electrical Characteristic Curves

Fig. 1 I_D - V_{DS}

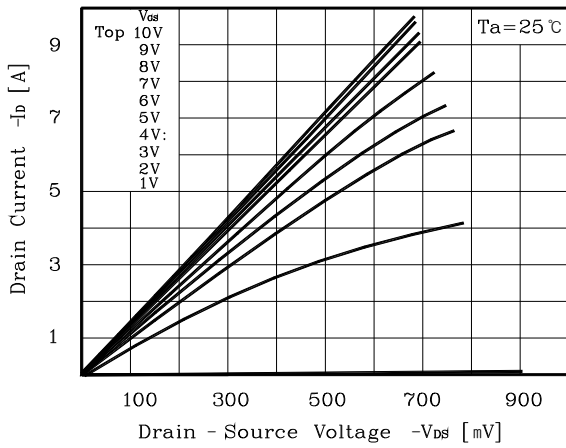


Fig. 2 I_D - V_{GS}

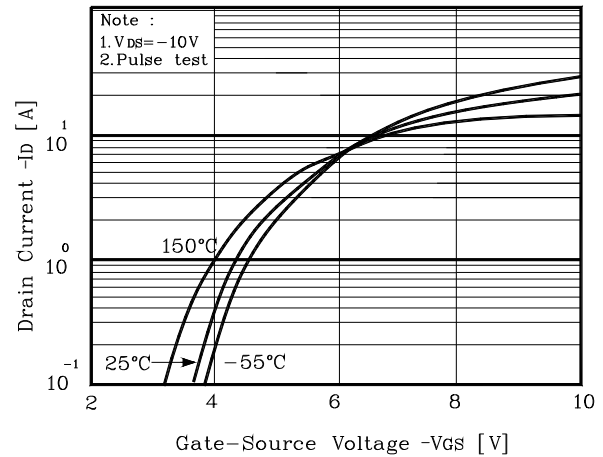


Fig. 3 $R_{DS(on)}$ - I_D

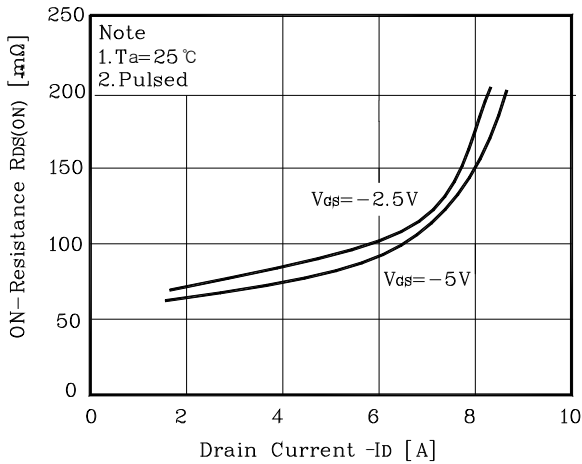


Fig. 4 I_S - V_{SD}

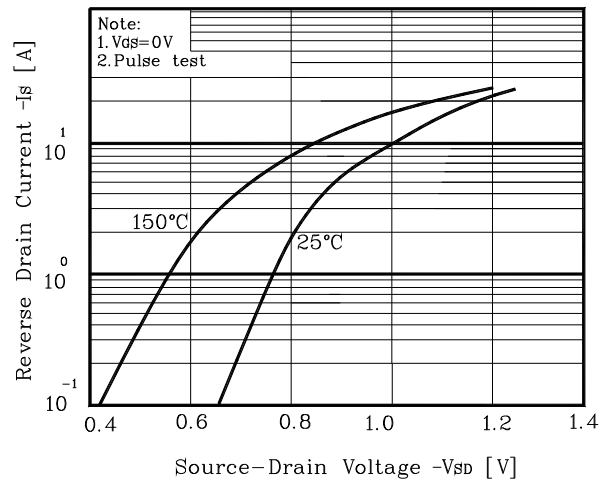


Fig. 5 Capacitance - V_{DS}

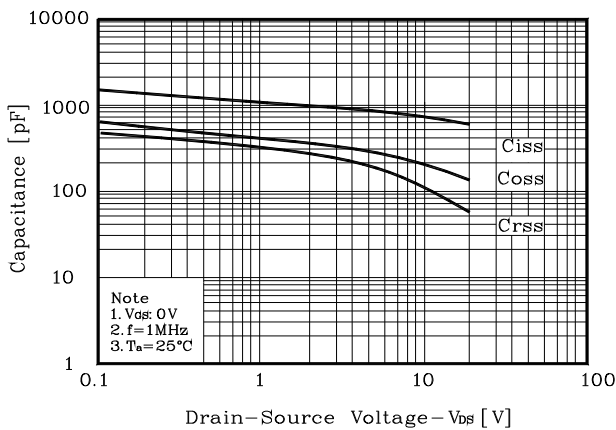


Fig. 6 V_{GS} - Q_G

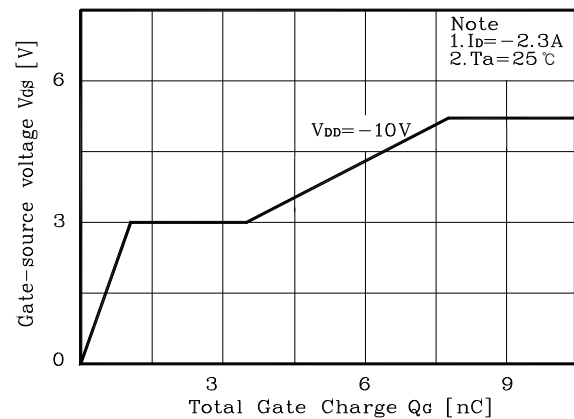


Fig. 7 $V_{DSS} - T_J$

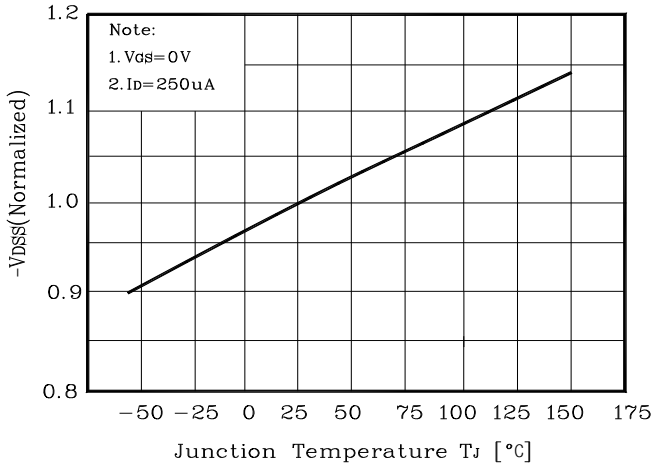


Fig. 8 $R_{DS(on)} - T_J$

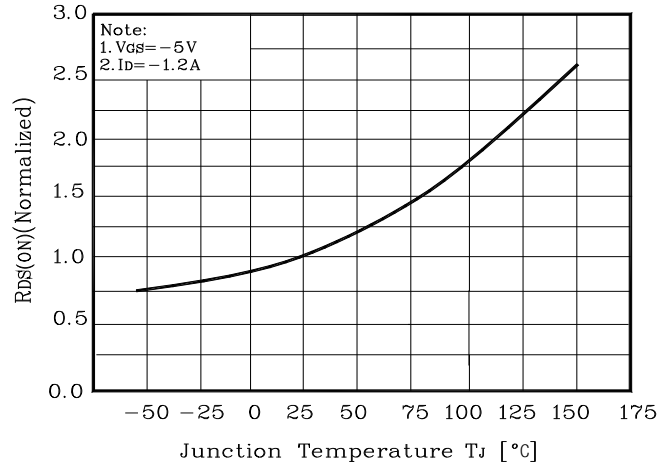


Fig. 9 $I_D - T_a$

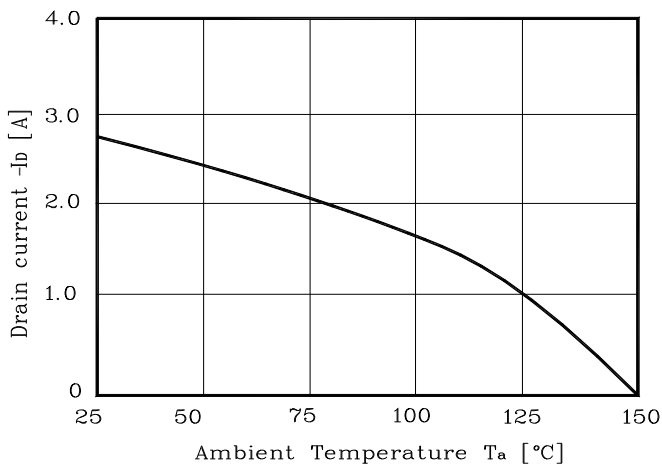
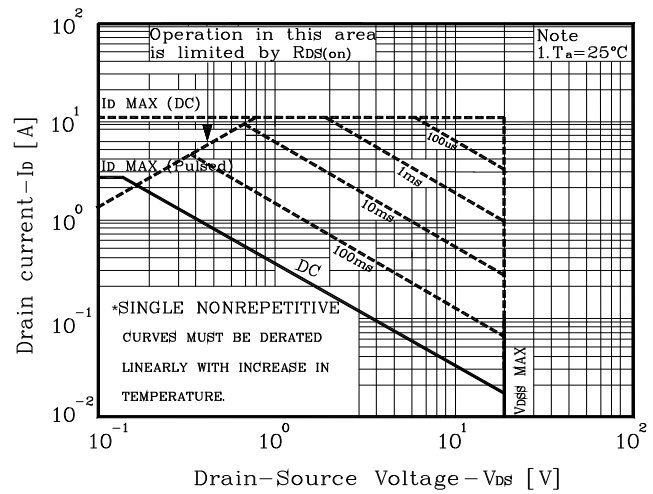


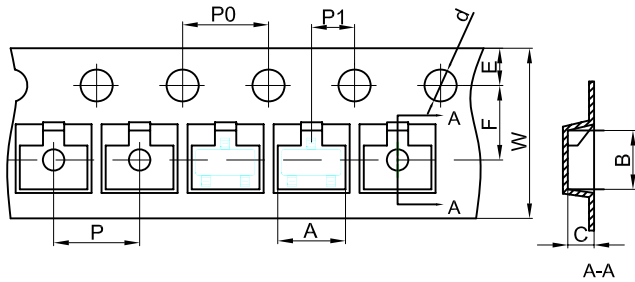
Fig. 10 Safe Operating Area





SOT23-3L Tape and Reel

SOT23-3L Embossed Carrier Tape

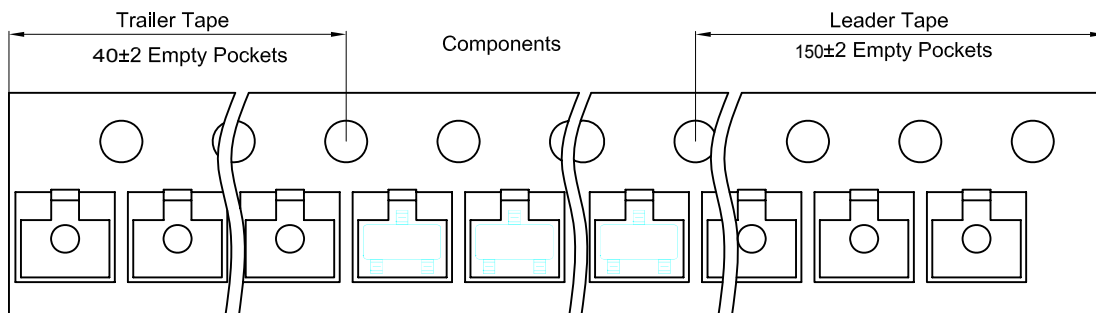


Packaging Description:

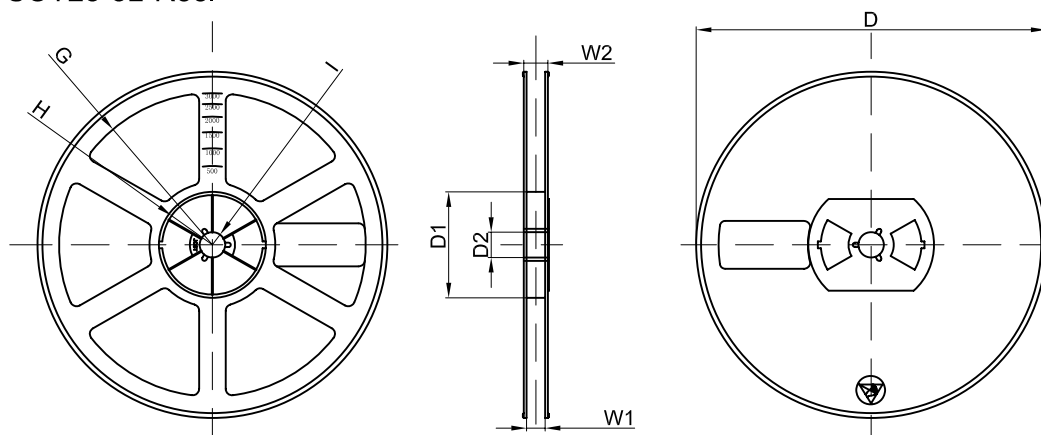
SOT23-3L parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.80 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg. type	A	B	C	d	E	F	P0	P	P1	W
SOT23-3L	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00
(Tolerance)	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+/-0.1	+0.3/-0.1

SOT23-3L Tape Leader and Trailer



SOT23-3L Reel

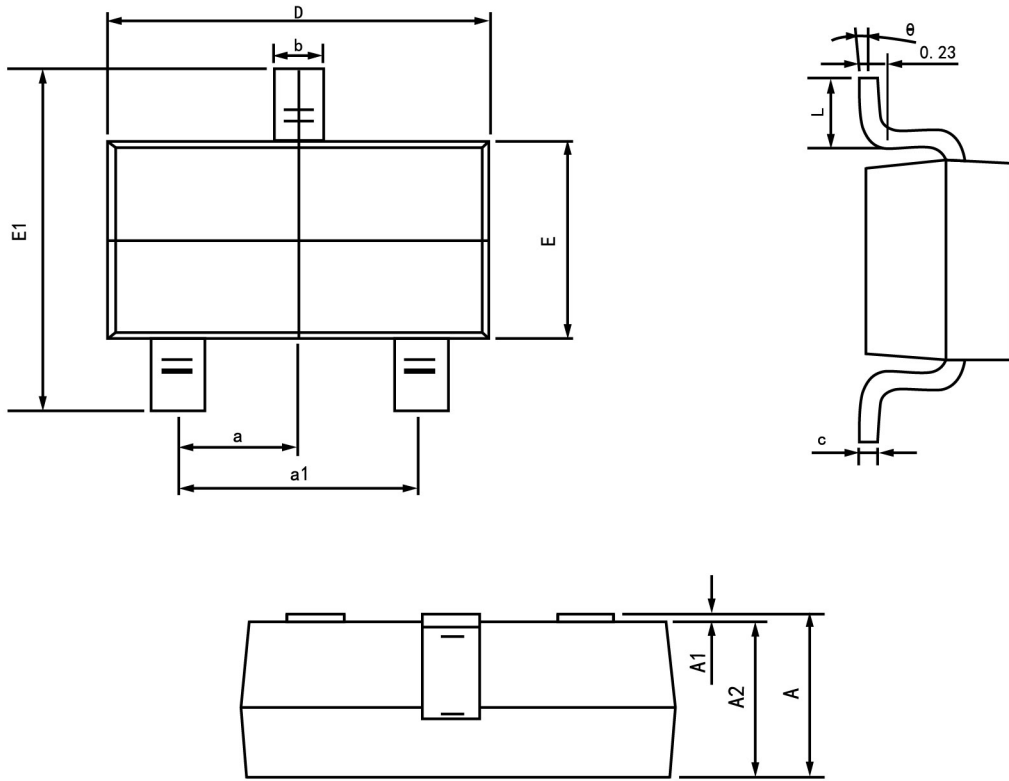


Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	+/-2	+/-1	+/-1	+/-1	+/-1	+/-1	+/-1	+/-1

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	24,000 pcs	189 x 182 x 105	120,000 pcs	545 x 202 x 202	



SOT23-3L Package outline dimensions



Symbol	Dimension in Millimeters	
	Min	Max
A	1.050	1.250
A1	0.000	0.100
A2	1.050	1.150
b	0.300	0.500
c	0.100	0.200
D	2.820	3.020
E	1.500	1.700
E1	2.650	2.950
e	0.950 (Basic)	
e1	1.800	2.000
L	0.300	0.600
theta	0°	8°