

Single P-channel MOSFET

ELM6PB8P6FCA-S

<https://www.elm-tech.com>

■General description

ELM6PB8P6FCA-S uses advanced trench technology to provide excellent $R_{ds(on)}$, low gate charge and low gate threshold voltage.

■Features

- $V_{ds}=-60V$
- $I_d=-3.0A$ ($V_{gs}=-10V$)
- $R_{ds(on)} = 83m\Omega$ ($V_{gs}=-10V$)
- $R_{ds(on)} = 120m\Omega$ ($V_{gs}=-4.5V$)

■Maximum absolute ratings

$T_a=25^{\circ}C$. Unless otherwise noted.

Parameter		Symbol	Limit	Unit	Note
Drain-source voltage		V_{ds}	-60	V	
Gate-source voltage		V_{gs}	± 20	V	
Continuous drain current	$T_c=25^{\circ}C$	I_d	-7.3	A	1
	$T_c=100^{\circ}C$		-6.3		
Continuous drain current	$T_a=25^{\circ}C$		-3.0	A	2
	$T_a=70^{\circ}C$		-2.4		
Pulsed drain current		I_{dm}	-30	A	3
Continuous body diode forward current		I_s	-4.8	A	1
Avalanche current ($L=0.1mH$)		I_{as}	-12	A	
Avalanche energy ($L=0.5mH$)		E_{as}	12	mJ	
Power dissipation	$T_c=25^{\circ}C$	P_d	21.0	W	1
	$T_c=100^{\circ}C$		8.4		
Power dissipation	$T_a=25^{\circ}C$		2.7	W	2
	$T_a=70^{\circ}C$		1.7		
Junction and storage temperature range		T_j, T_{stg}	-55 to +150	$^{\circ}C$	

■Thermal characteristics

Parameter	Symbol	Typ.	Max.	Unit	Note
Thermal resistance, junction-to-case	$R_{\theta jc}$	-	6	$^{\circ}C/W$	
Thermal resistance, junction-to-ambient	$R_{\theta ja}$	-	47		1

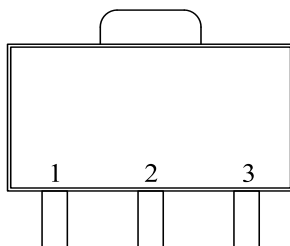
NOTE : 1. The power dissipation P_d is based on $T_j(max)=150^{\circ}C$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

2. The value of $R_{\theta ja}$ is measured with the device mounted on 1 in² FR-4 board with 2 oz. copper, in a still air environment with $T_a=25^{\circ}C$. The power dissipation P_d is based on $R_{\theta ja}$ and the maximum allowed junction temperature of $150^{\circ}C$. The value in any given application depends on the user's specific board design.

3. Repetitive rating, pulse width limited by junction temperature $T_j(max)=150^{\circ}C$. Ratings are based on low frequency and low duty cycles to keep initial $T_j=25^{\circ}C$.

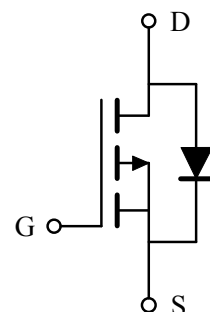
■Pin configuration

SOT-89(TOP VIEW)



Pin No.	Pin name
1	GATE
2	DRAIN
3	SOURCE

■Circuit



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■Electrical characteristics

Ta=25°C. Unless otherwise noted.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	BVdss	Id=-250μA, Vgs=0V	-60	-	-	V
Zero gate voltage drain current	Idss	Vds=-48V, Vgs=0V	-	-	-1	μA
Gate-body leakage current	Igss	Vds=0V, Vgs=±20V	-	-	±100	nA
Gate threshold voltage	Vgs(th)	Vds=Vgs, Id=-250μA	-1.0	-	-2.5	V
Static drain-source on-resistance	Rds(on)	Vgs=-10V, Id=-3A	-	83	110	mΩ
		Vgs=-4.5V, Id=-2A	-	120	170	
Forward transconductance	Gfs	Vds=-10V, Id=-3A	-	6.4	-	S
Diode forward voltage *1	Vsd	Is=-3A, Vgs=0V	-	-0.84	-1.20	V
DYNAMIC PARAMETERS						
Input capacitance	Ciss	Vgs=0V, Vds=-30V, f=1MHz	-	500	-	pF
Output capacitance	Coss		-	51	-	pF
Reverse transfer capacitance	Crss		-	37	-	pF
Gate resistance	Rg	f=1MHz	-	6.6	-	Ω
SWITCHING PARAMETERS						
Total gate charge *1, 2	Qg	Vgs=-10V, Vds=-30V Id=-3A	-	11.0	-	nC
Gate-source charge *1, 2	Qgs		-	2.0	-	nC
Gate-drain charge *1, 2	Qgd		-	3.2	-	nC
Turn-on delay time *1, 2	td(on)	Vgs=-10V, Vds=-30V Id=-3A, Rgen=3Ω	-	6.4	-	ns
Turn-on rise time *1, 2	tr		-	17.0	-	ns
Turn-off delay time *1, 2	td(off)		-	25.0	-	ns
Turn-off fall time *1, 2	tf		-	7.2	-	ns
Body diode reverse recovery time	trr	If=-3A, dIf/dt=100A/μs	-	13	-	ns
Body diode reverse recovery charge	Qrr		-	8	-	nC

* 1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%.

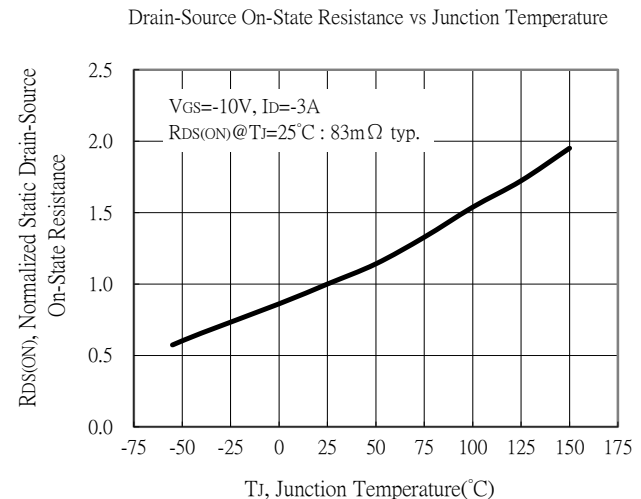
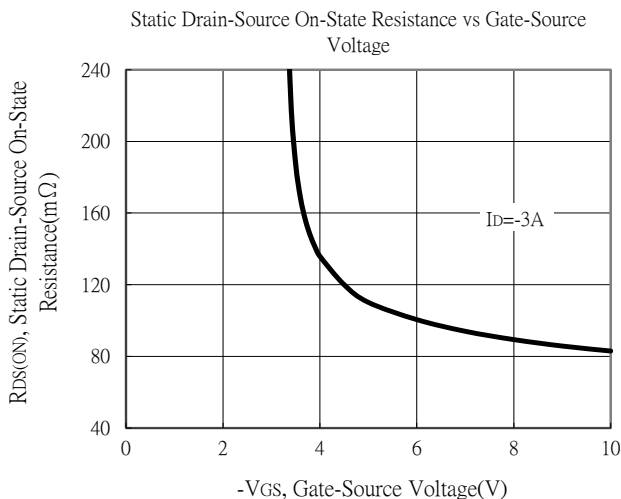
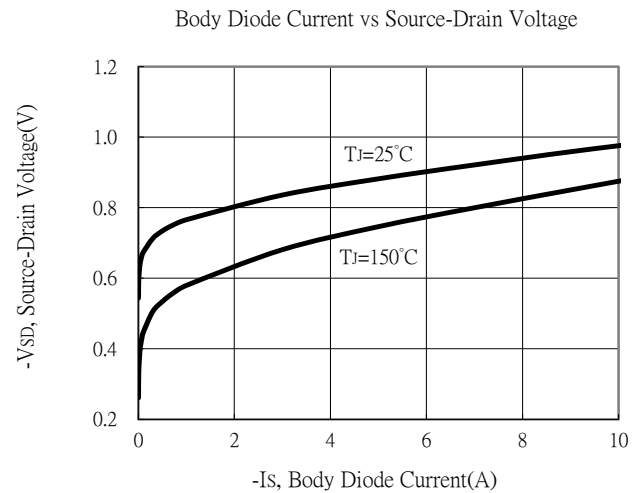
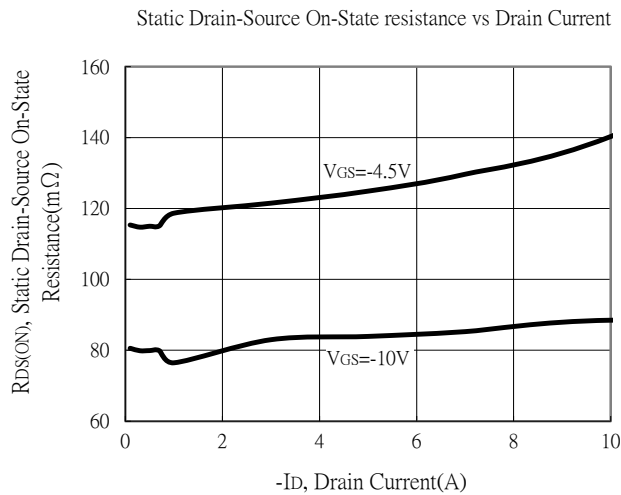
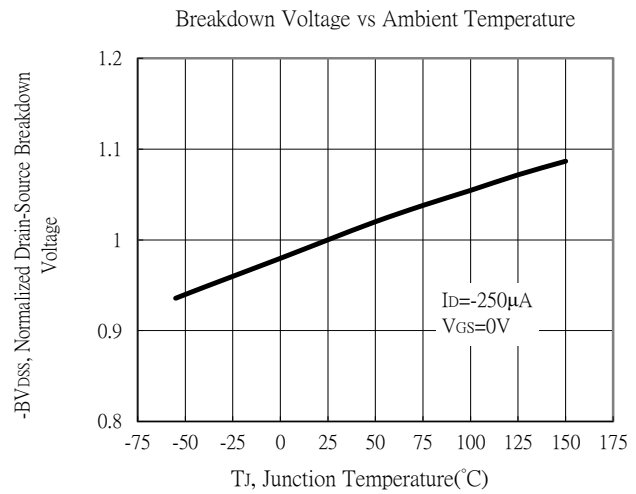
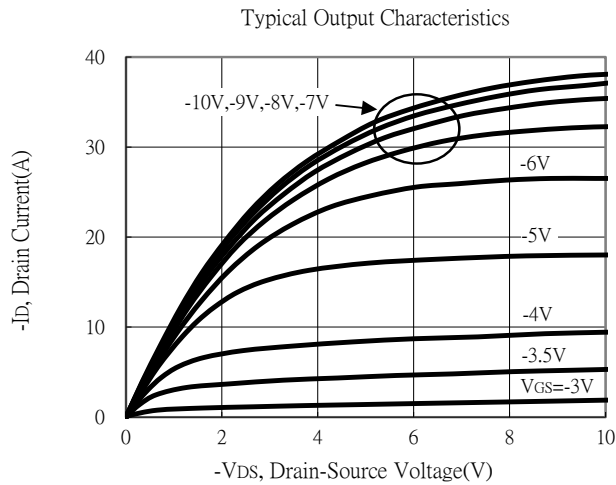
2. Independent of operating temperature.

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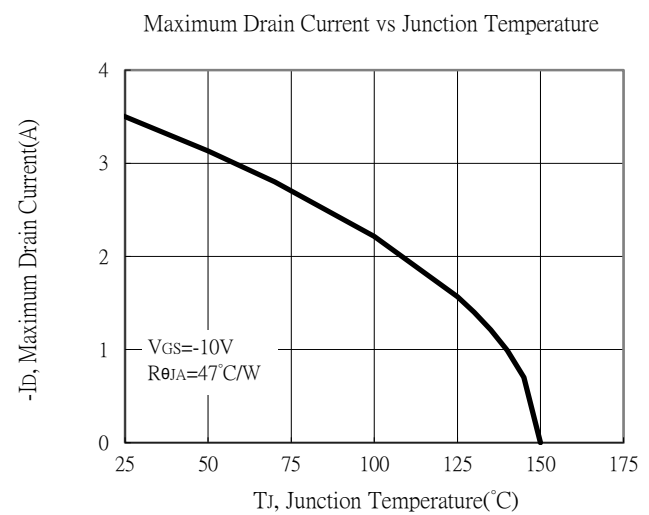
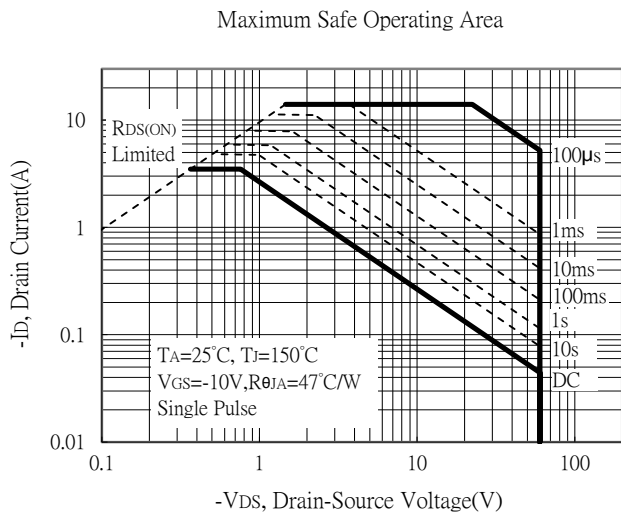
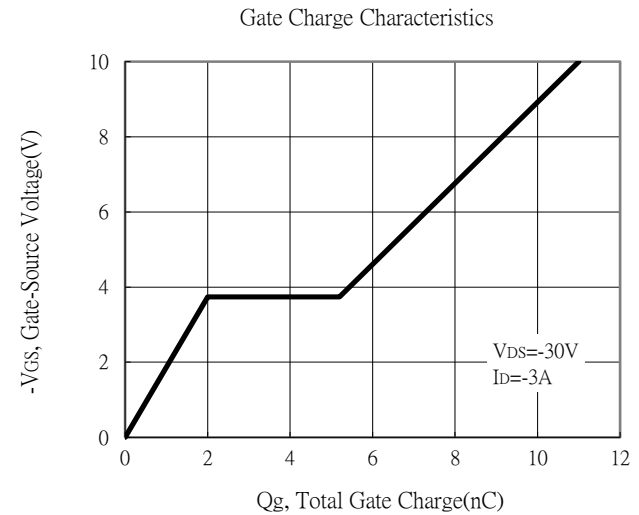
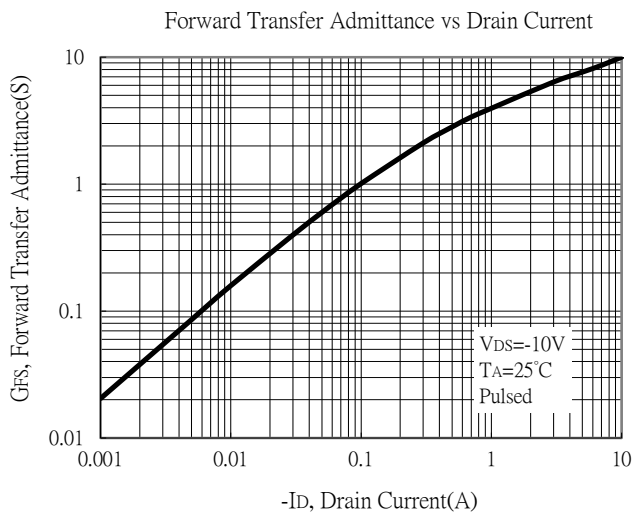
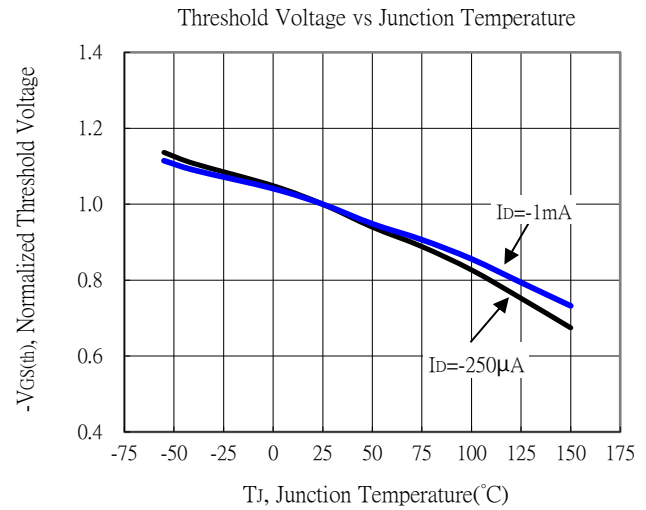
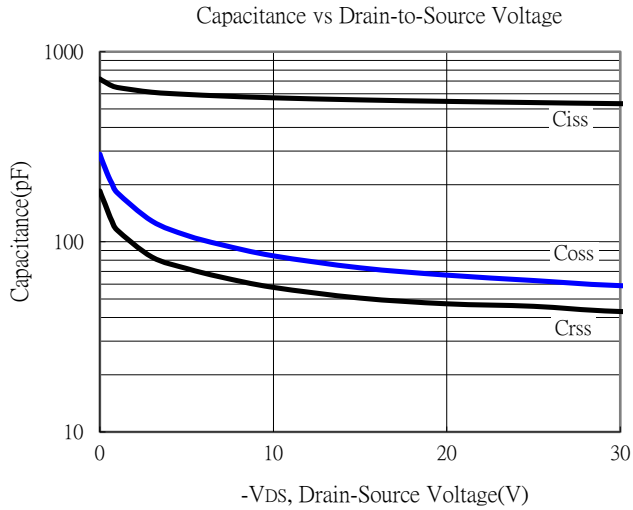
■ Typical electrical and thermal characteristics



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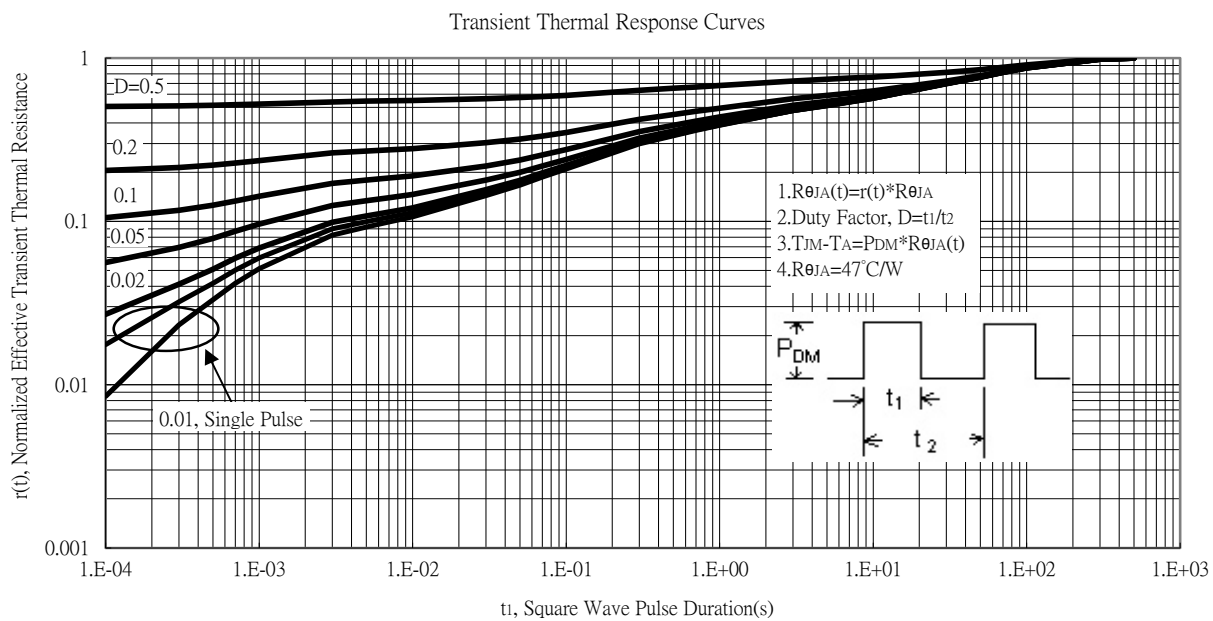
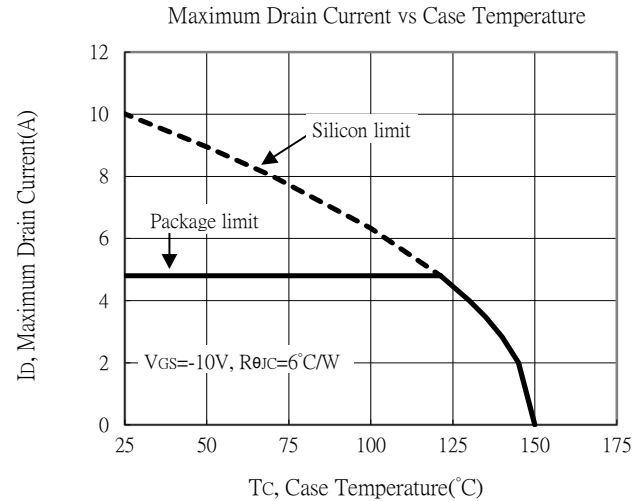
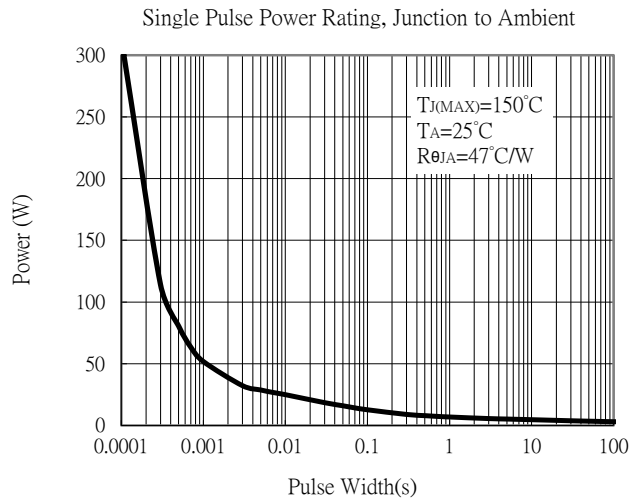
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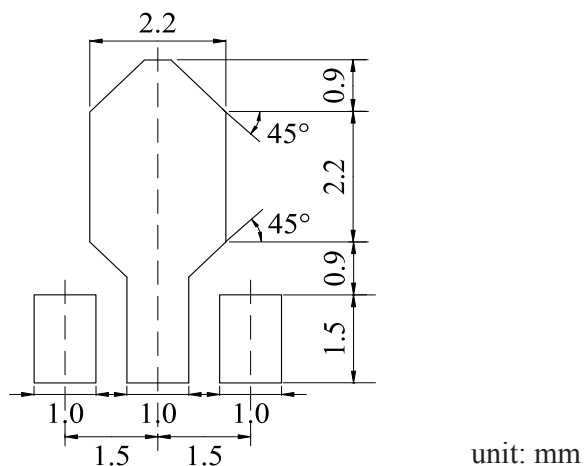


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■Recommended soldering footprint

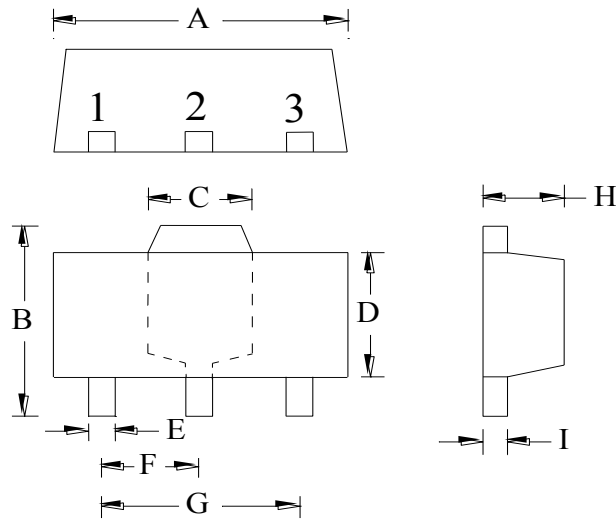


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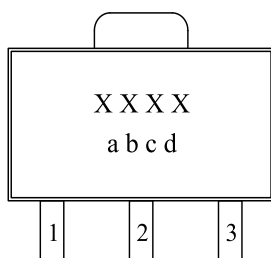
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■SOT-89 dimension (1,000pcs/reel)



Symbols	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.40	4.60	0.1732	0.1811
B	3.94	4.25	0.1551	0.1673
C	1.55 REF		0.0610 REF	
D	2.30	2.60	0.0906	0.1024
E	0.32	0.52	0.0126	0.0205
F	1.50 TYP		0.0591 TYP	
G	3.00 TYP		0.1181 TYP	
H	1.40	1.60	0.0551	0.0630
I	0.35	0.44	0.0138	0.0173

■Marking



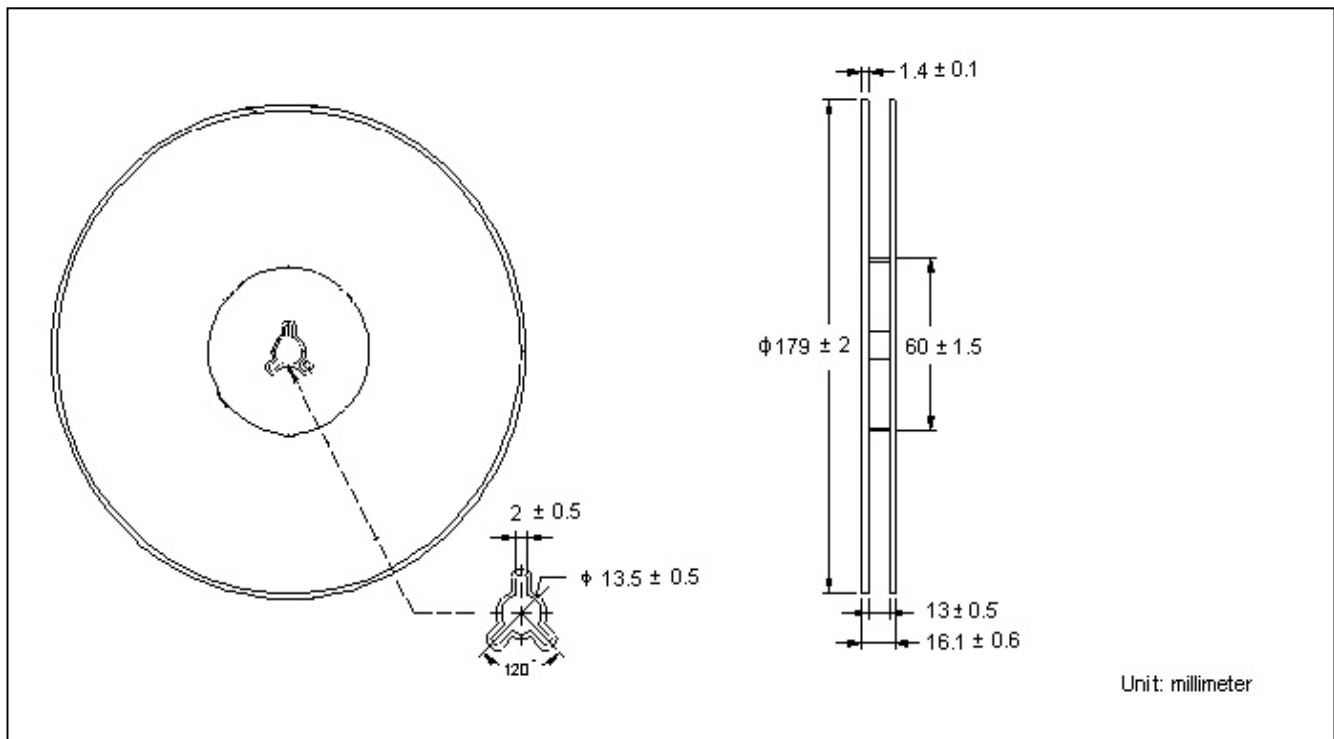
Symbols	Content
xxxx	Product code
a	Yearly code : The last digit of Christian year
b	Month code : Jan→A, Feb→B, ~ Dec→M (I excepted)
c, d	Assembly code : 01 to 99

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■SOT-89 Reel & carrier tape dimension (Unit: mm)

- Reel



- Carrier tape

