

# BRC144ECM Series

NPN Built-in Resistor Transistor CMPAK Series  
Inverter, Driver, Switching

## HITACHI

ADE-208-1445B (Z)

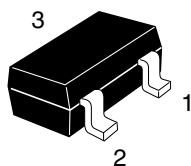
Rev.2  
Sep. 2001

### Features

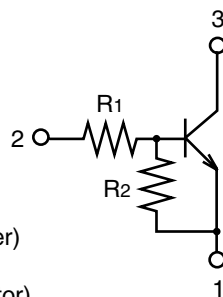
- Built-in Resistor Type
- Simplifies Circuit Design
- Reduces Board Space
- Complementary pair with BRA144ECM series

### Outline

CMPAK



1. Ground (Emitter)
2. Input (Base)
3. Output (Collector)



Note: Marking is shown in below.

Device	Marking	R1 (k $\Omega$ )	R2 (k $\Omega$ )
BRC144ECM	BG	47	47
BRC124ECM	DG	22	22
BRC114ECM	FG	10	10
BRC143ECM	HG	4.7	4.7
BRC123ECM	KG	2.2	2.2

# BRC144ECM Series

## Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

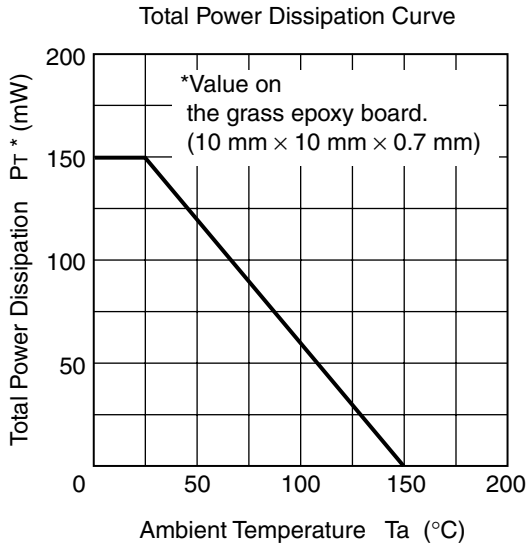
Item		Symbol	Ratings	Unit
Supply voltage		$V_{CC}$	50	V
Input voltage	BRC144ECM	$V_I$	-10 to +50	V
	BRC124ECM		-10 to +45	
	BRC114ECM		-10 to +30	
	BRC143ECM		-10 to +20	
	BRC123ECM		-10 to +15	
Output current		$I_o$	100	mA
Total power dissipation		$P_T^*$	150	mW
Junction temperature		$T_j$	150	$^\circ\text{C}$
Storage temperature		$T_{stg}$	-55 to +150	$^\circ\text{C}$

\*Value on the glass epoxy board. (10 mm × 10 mm × 0.7 mm)

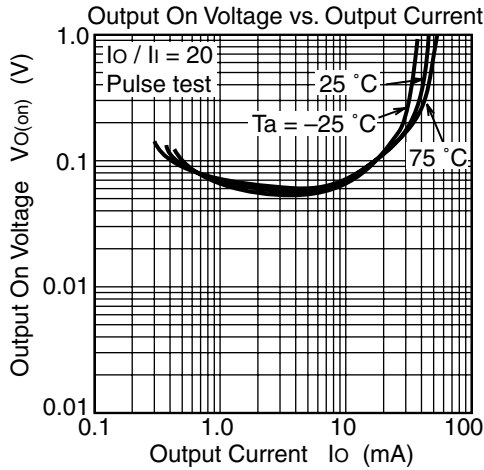
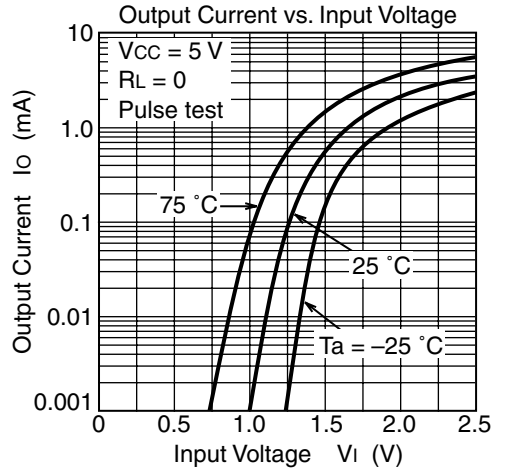
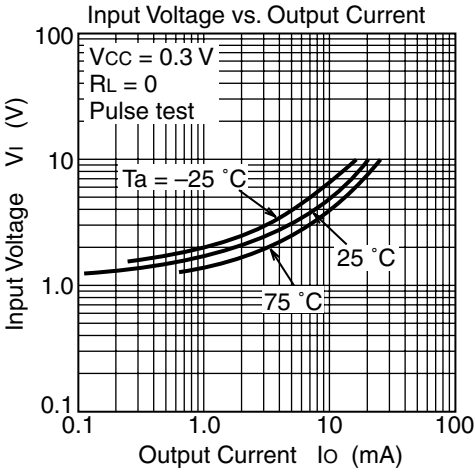
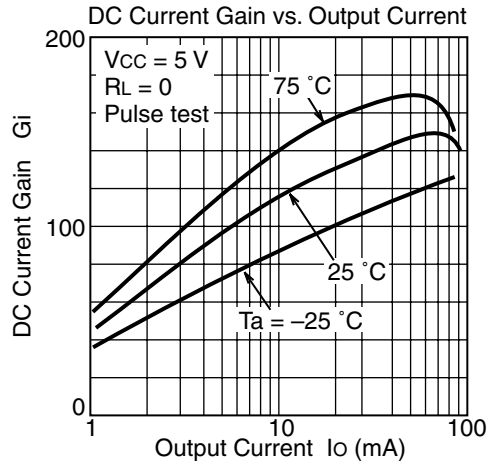
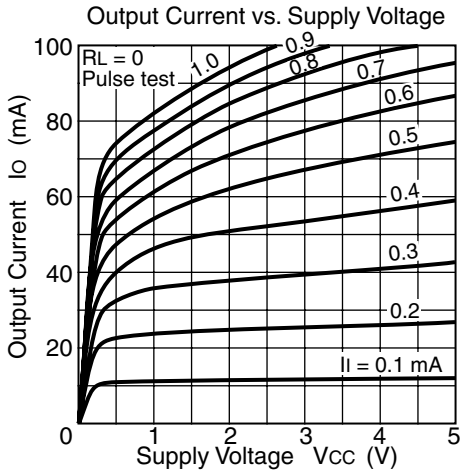
## Electrical Characteristics

(Ta = 25°C)

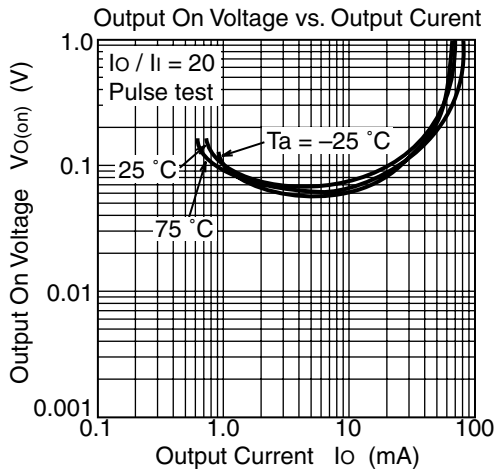
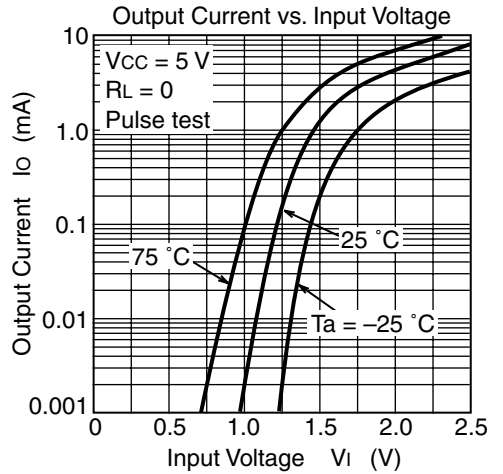
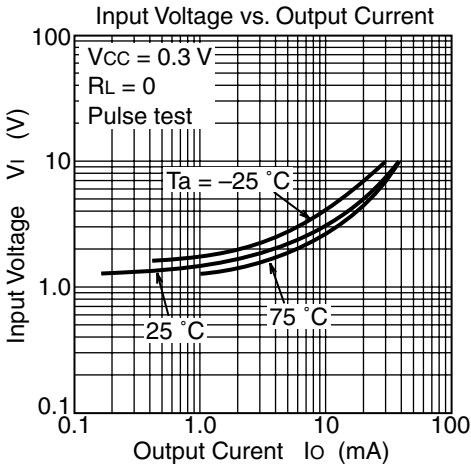
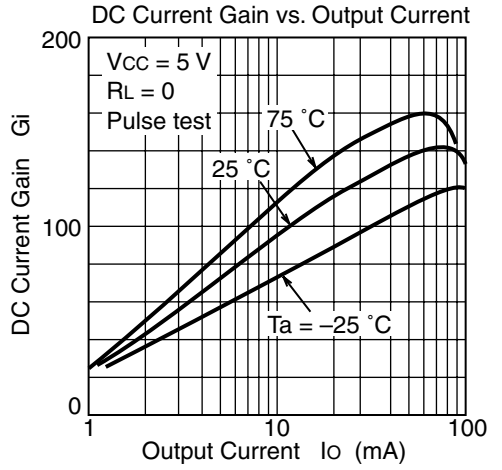
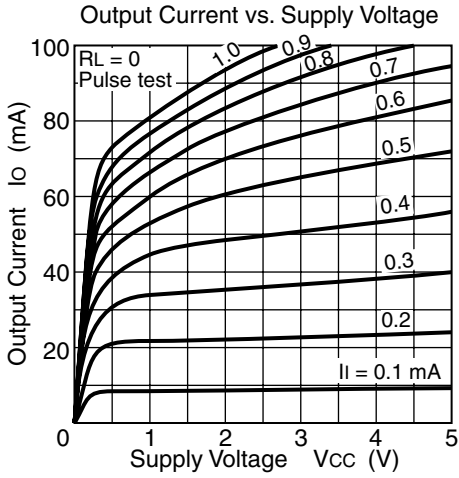
Item		Symbol	Min	Typ	Max	Unit	Test conditions
Input on voltage	BRC144ECM	$V_{I(on)}$	1.5	—	4.5	V	$V_{cc} = 0.3 \text{ V}, I_o = 5 \text{ mA}$
	BRC124ECM		1.3	—	3.0		
	BRC114ECM		1.2	—	2.4		
	BRC143ECM		1.1	—	2.0		
	BRC123ECM		1.1	—	1.8		
Input off voltage	BRC144ECM	$V_{I(off)}$	1.0	—	1.5	V	$V_{cc} = 5 \text{ V}, I_o = 100 \mu\text{A}$
	BRC124ECM		1.0	—	1.5		
	BRC114ECM		1.0	—	1.5		
	BRC143ECM		1.0	—	1.5		
	BRC123ECM		1.0	—	1.5		
Output saturation voltage		$V_{O(on)}$	—	—	0.3	V	$I_o = 10 \text{ mA}, I_1 = 0.5 \text{ mA}$
Output cutoff current		$I_{O(off)}$	—	—	0.5	$\mu\text{A}$	$V_{cc} = 50 \text{ V}, I_1 = 0$
DC current transfer ratio	BRC144ECM	$G_i$	70	—	—		$V_{cc} = 5 \text{ V}, I_o = 5 \text{ mA}$
	BRC124ECM		56	—	—		
	BRC114ECM		30	—	—		
	BRC143ECM		20	—	—		$V_{cc} = 5 \text{ V}, I_o = 10 \text{ mA}$
	BRC123ECM		20	—	—		$V_{cc} = 5 \text{ V}, I_o = 20 \text{ mA}$
Input resistance	BRC144ECM	$R_i$	33	47	61	$\text{k}\Omega$	
	BRC124ECM		15	22	28		
	BRC114ECM		7	10	13		
	BRC143ECM		3.3	4.7	6.1		
	BRC123ECM		1.5	2.2	2.8		
Resistance ratio		$R_1/R_2$	0.8	1.0	1.2		



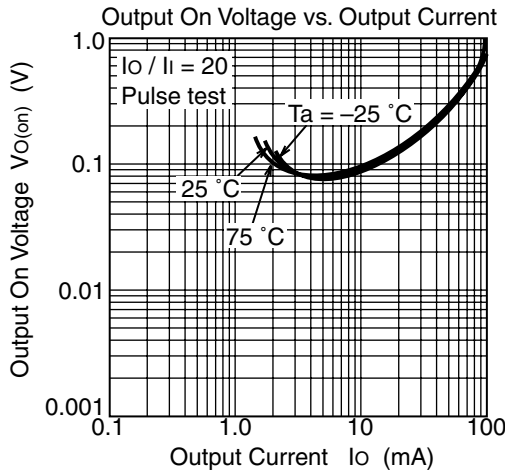
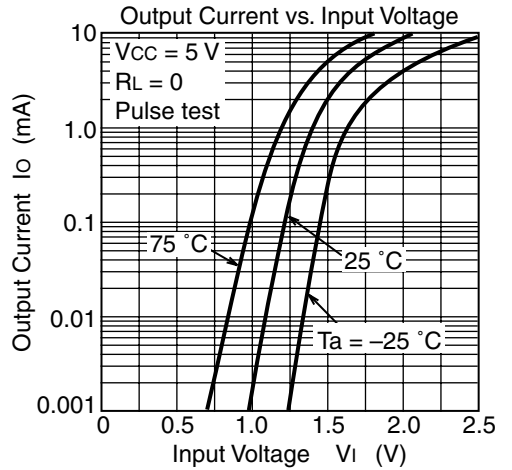
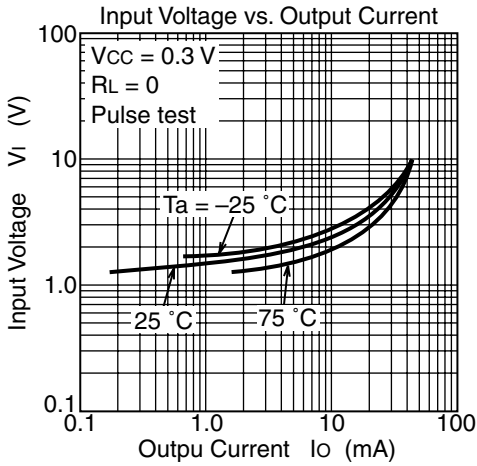
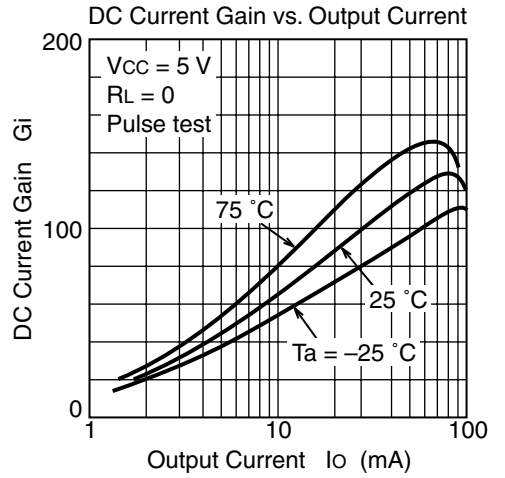
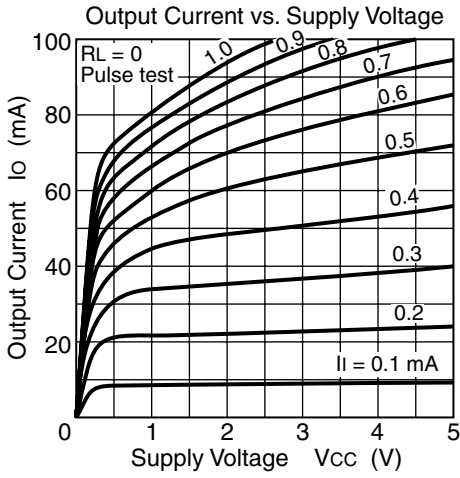
Main Characteristics (BRC144ECM)



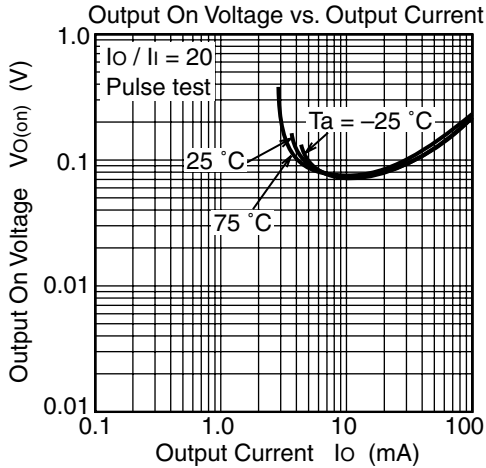
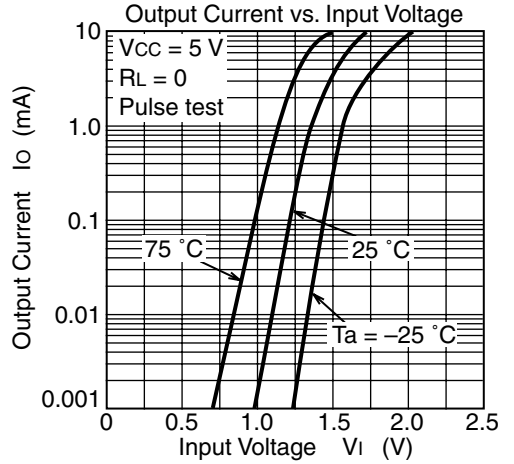
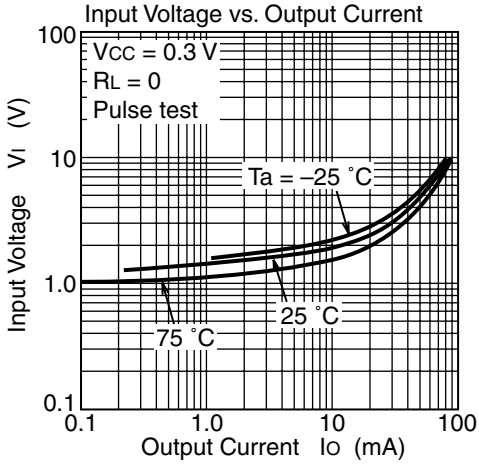
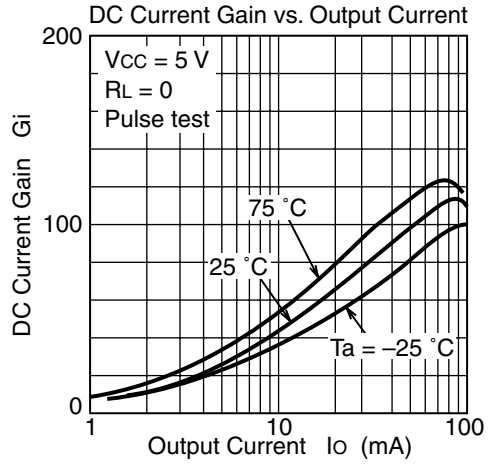
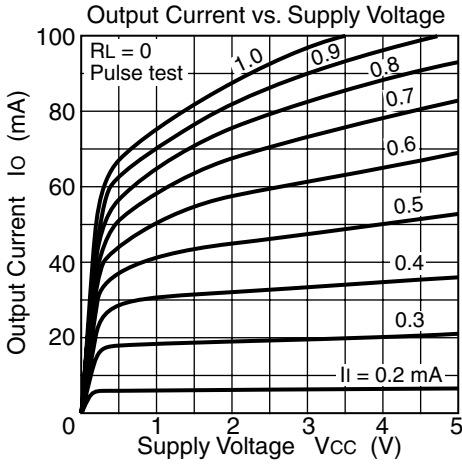
## Main Characteristics (BRC124ECM)



Main Characteristics (BRC114ECM)

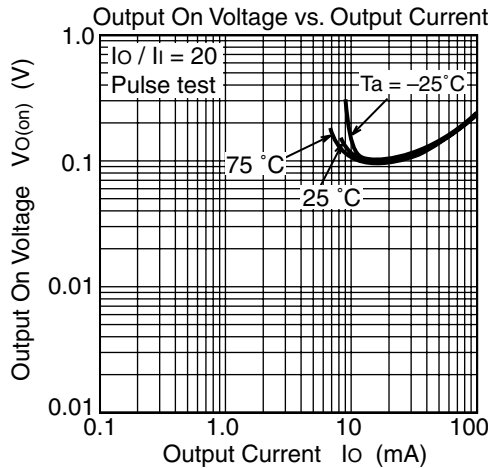
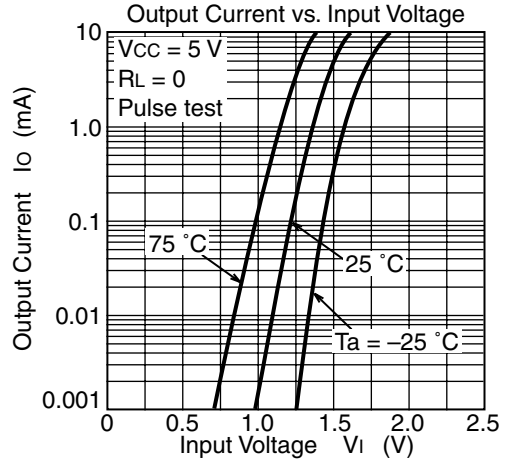
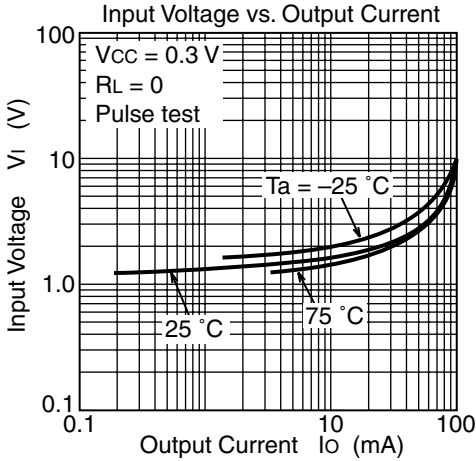
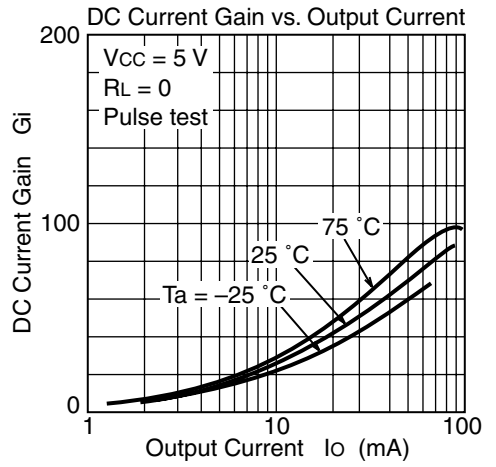
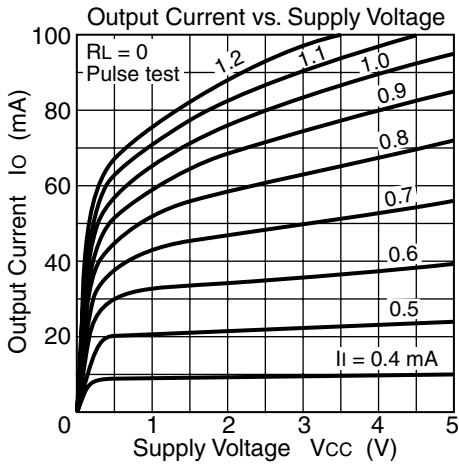


## Main Characteristics (BRC143ECM)





Main Characteristics (BRC123ECM)



## Taping Specification

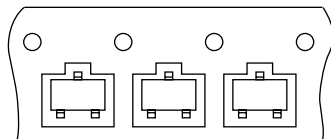
There are two different size reels in CMPAK packaging.

Packing to “Left” direction

Purchasing Identification Code

Standard Reel 3000 pcs/reel: Type No. + Mark **TL**

Large Reel 12000 pcs/reel: Type No. + Mark **UL**

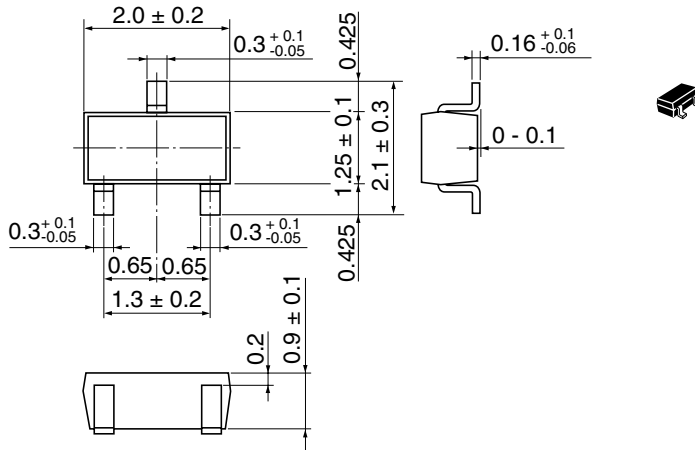


Marking face is up.  
Center lead goes to left.

Direction of feed →

Package Dimensions

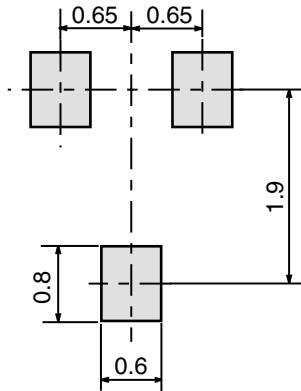
As of January, 2001  
Unit: mm



Hitachi Code	CMPAK
JEDEC	—
EIAJ	Conforms
Mass (reference value)	0.006 g

Footprint

CMPAK



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### Hitachi, Ltd.

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Hitachi Europe GmbH Electronic Components Group Dornacher Straße 3 D-85622 Feldkirchen Postfach 201, D-85619 Feldkirchen Germany Tel: <49> (89) 9 9180-0 Fax: <49> (89) 9 29 30 00
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Hitachi Asia Ltd. (Taipei Branch Office) 4/F, No. 167, Tun Hwa North Road Hung-Kuo Building Taipei (105), Taiwan Tel : <886>-(2)-2718-3666 Fax : <886>-(2)-2718-8180 Telex : 23222 HAS-TP URL : <a href="http://www.hitachi.com.tw">http://www.hitachi.com.tw</a>
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