

# BRA144ECM Series

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

# HITACHI

ADE-208-1444B (Z)

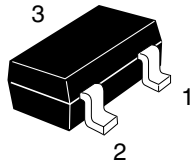
Rev.2  
Sep. 2001

## Features

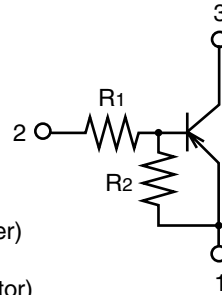
- Built-in Resistor Type
- Simplifies Circuit Design
- Reduces Board Space
- Complementary pair with BRC144ECM series

## Outline

CMPAK



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



Note: Marking is shown in below.

Device	Marking	R1 (k $\Omega$ )	R2 (k $\Omega$ )
BRA144ECM	AG	47	47
BRA124ECM	CG	22	22
BRA114ECM	EG	10	10
BRA143ECM	GG	4.7	4.7
BRA123ECM	JG	2.2	2.2

[www.DataSheet.in](http://www.DataSheet.in)

## Absolute Maximum Ratings

(Ta = 25°C)

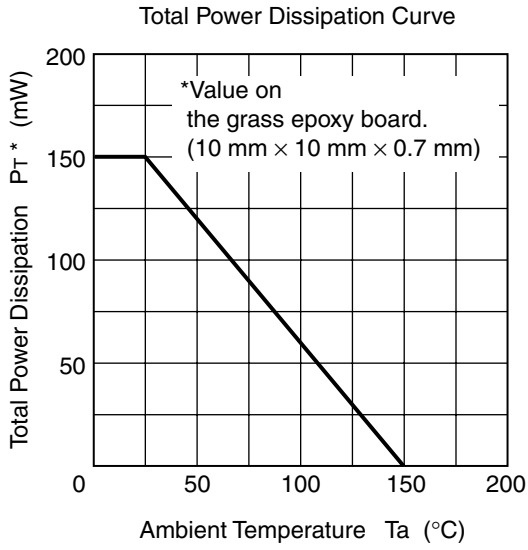
Item		Symbol	Ratings	Unit
Supply voltage		$V_{CC}$	-50	V
Input voltage	BRA144ECM	$V_I$	+10 to -50	V
	BRA124ECM		+10 to -45	
	BRA114ECM		+10 to -30	
	BRA143ECM		+10 to -20	
	BRA123ECM		+10 to -15	
Output current		$I_O$	-100	mA
Total power dissipation		$P_T^*$	150	mW
Junction temperature		$T_J$	150	°C
Storage temperature		$T_{stg}$	-55 to +150	°C

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

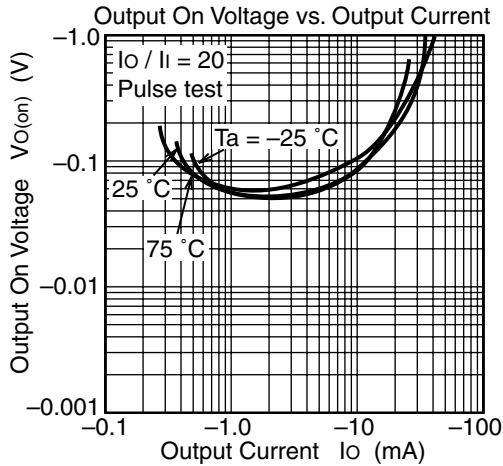
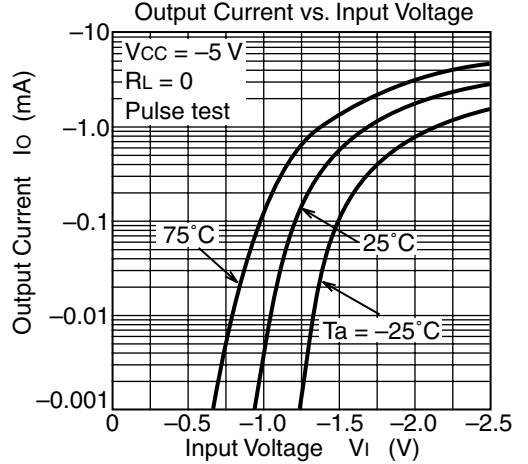
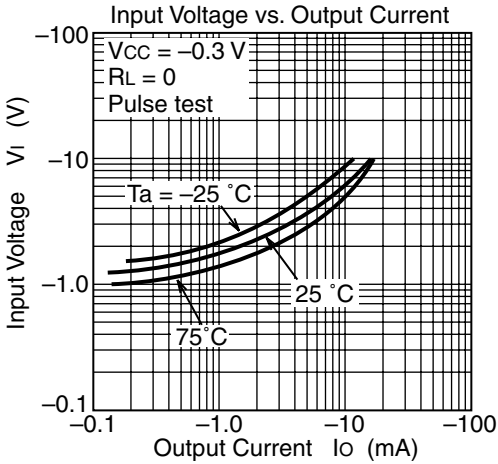
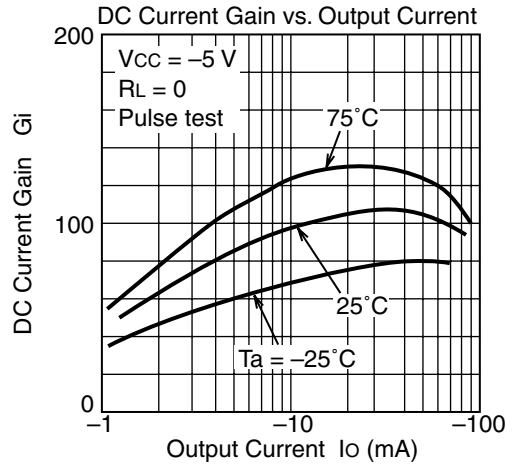
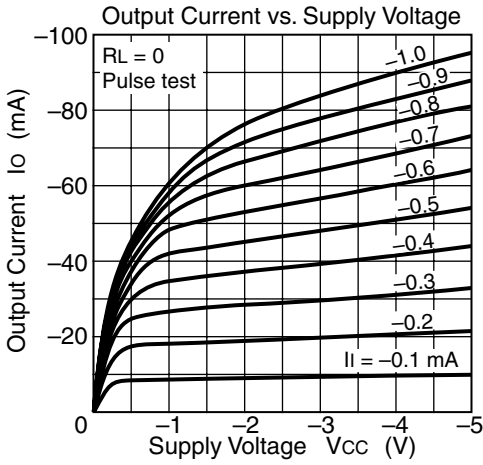
## Electrical Characteristics

(Ta = 25°C)

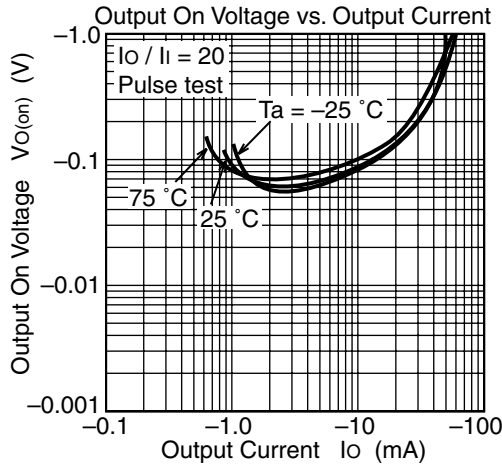
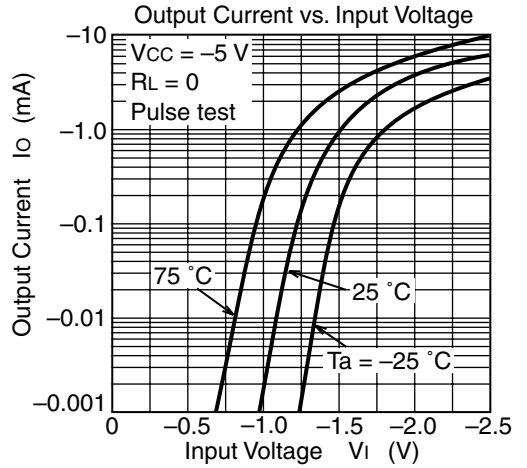
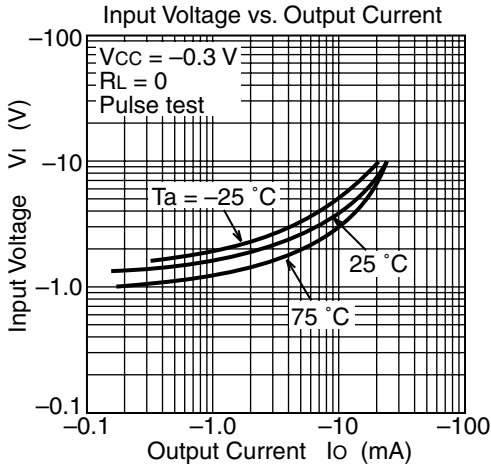
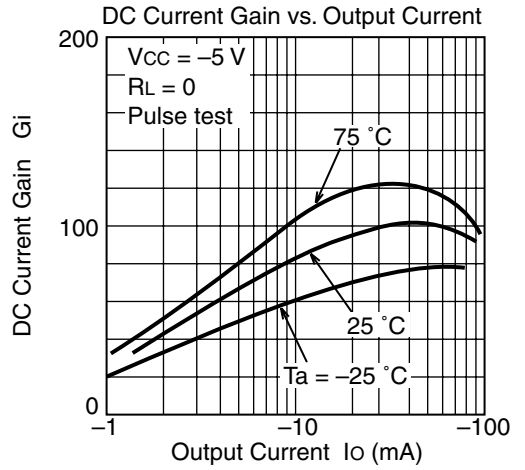
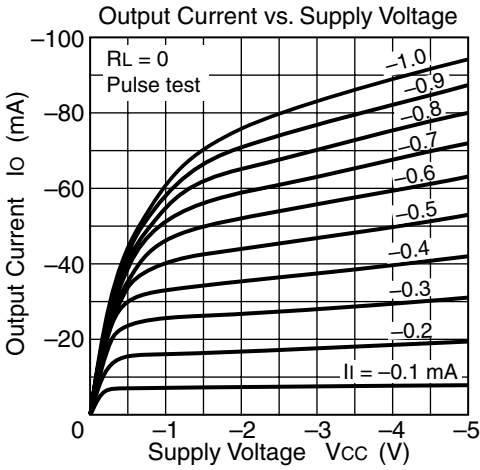
Item		Symbol	Min	Typ	Max	Unit	Test conditions	
Input on voltage	BRA144ECM	$V_{I(on)}$	-1.5	—	-4.5	V	$V_{cc} = -0.3 V,$ $I_o = -5 mA$	
	BRA124ECM		-1.3	—	-3.0			
	BRA114ECM		-1.2	—	-2.4			
	BRA143ECM		-1.1	—	-2.0			
	BRA123ECM		-1.1	—	-1.8			
Input off voltage	BRA144ECM	$V_{I(off)}$	-1.0	—	-1.5	V	$V_{cc} = -5 V,$ $I_o = -100 \mu A$	
	BRA124ECM		-1.0	—	-1.5			
	BRA114ECM		-1.0	—	-1.5			
	BRA143ECM		-1.0	—	-1.5			
	BRA123ECM		-1.0	—	-1.5			
Output saturation voltage		$V_{O(on)}$	—	—	-0.3	V	$I_o = -10 mA,$ $I_i = -0.5 mA$	
Output cutoff current		$I_{O(off)}$	—	—	-0.5	$\mu A$	$V_{cc} = -50 V, I_i = 0$	
DC current transfer ratio	BRA144ECM	$G_i$	70	—	—		$V_{cc} = -5 V, I_o = -5 mA$	
	BRA124ECM		56	—	—			
	BRA114ECM		30	—	—			
	BRA143ECM		20	—	—			$V_{cc} = -5 V, I_o = -10 mA$
	BRA123ECM		20	—	—			$V_{cc} = -5 V, I_o = -20 mA$
Input resistance	BRA144ECM	$R_i$	33	47	61	k $\Omega$		
	BRA124ECM		15	22	28			
	BRA114ECM		7	10	13			
	BRA143ECM		3.3	4.7	6.1			
	BRA123ECM		1.5	2.2	2.8			
Resistance ratio		$R_1/R_2$	0.8	1.0	1.2			



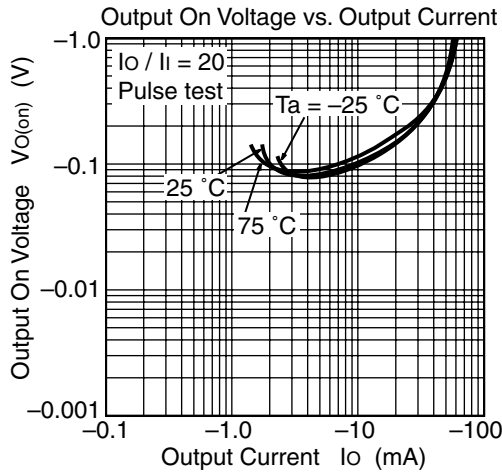
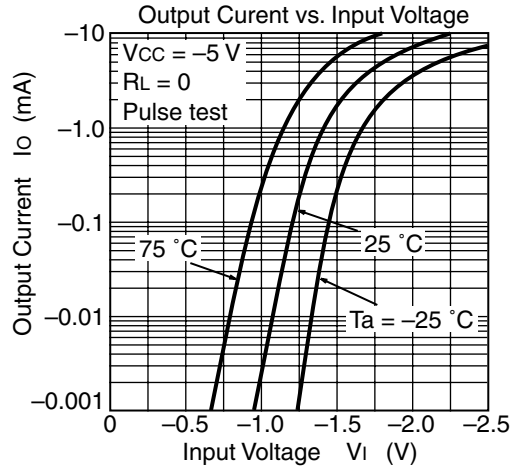
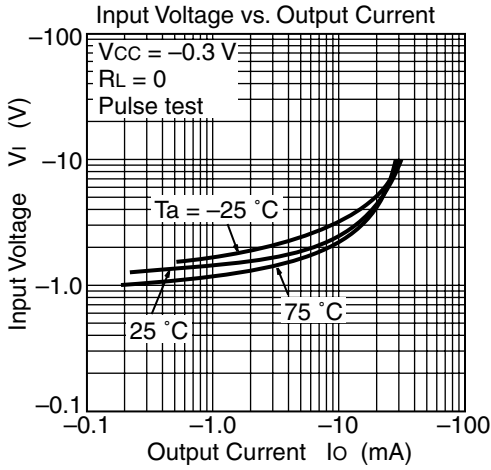
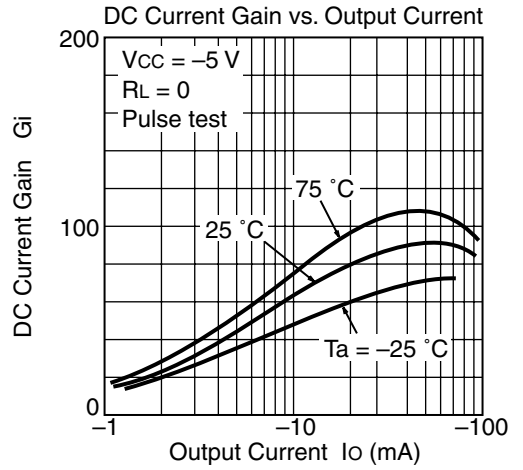
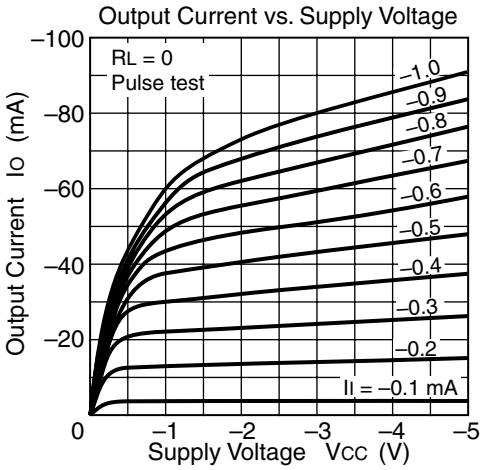
Main Characteristics (BRA144ECM)



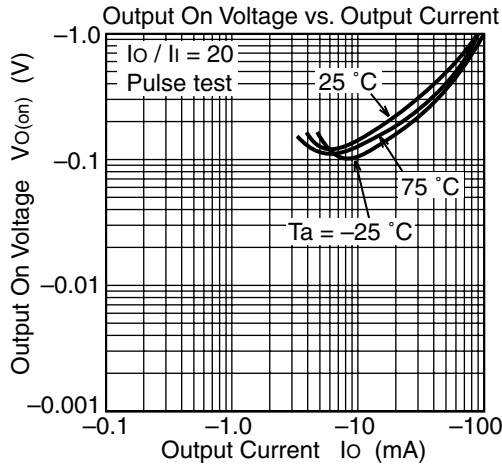
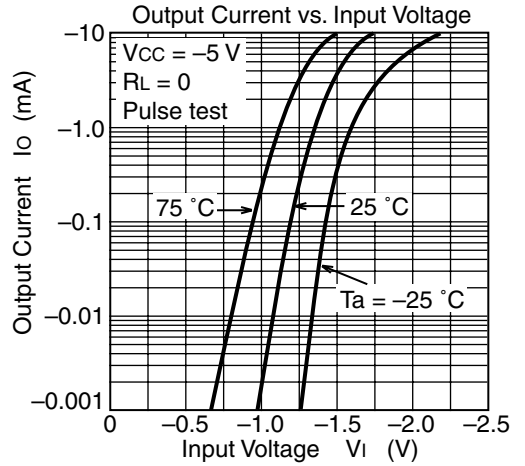
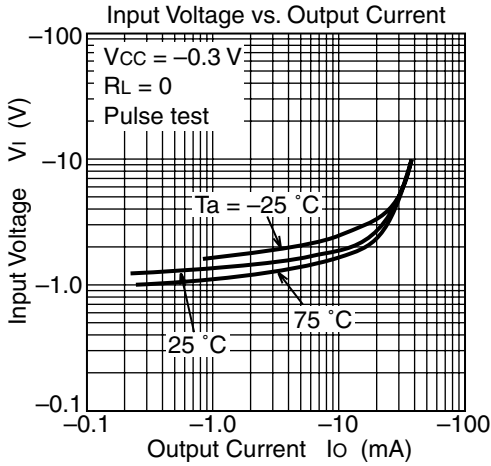
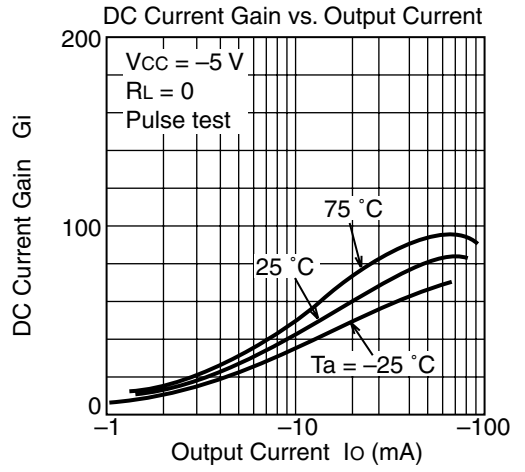
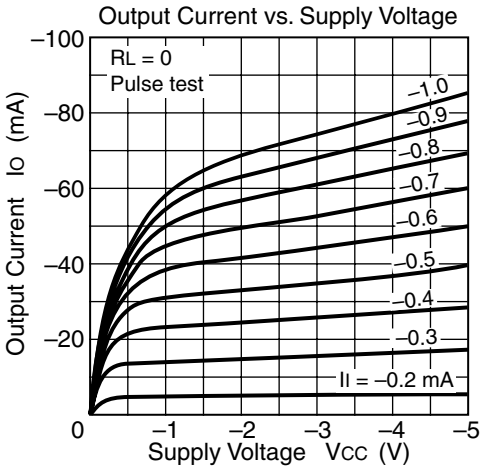
**Main Characteristics (BRA124ECM)**



Main Characteristics (BRA114ECM)

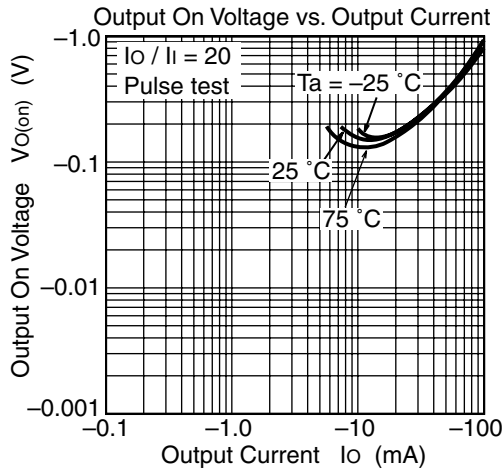
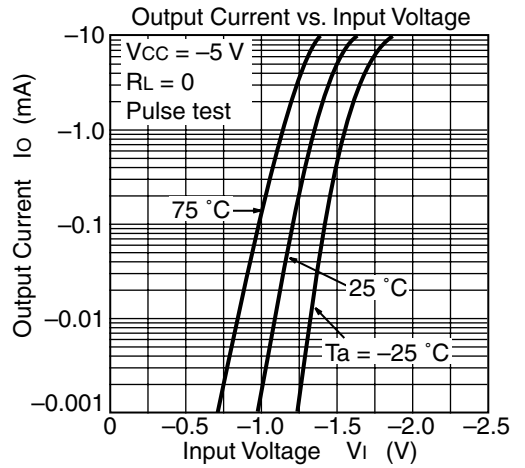
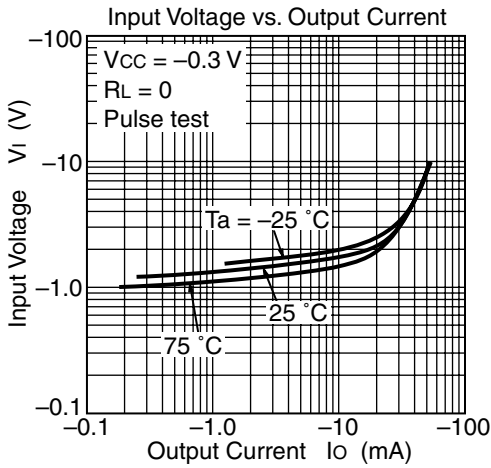
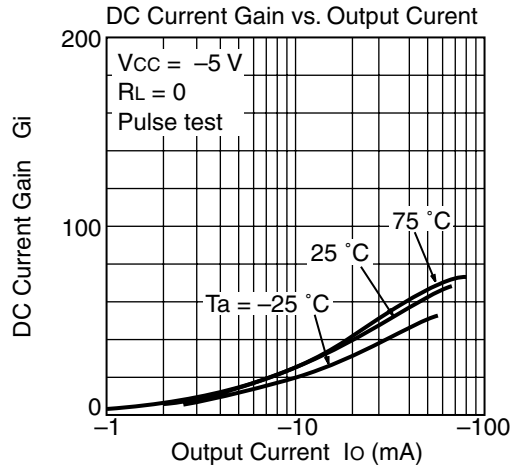
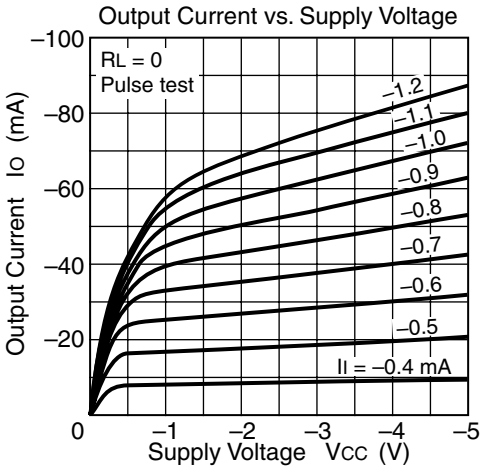


**Main Characteristics (BRA143ECM)**





Main Characteristics (BRA123ECM)



## Taping Specification

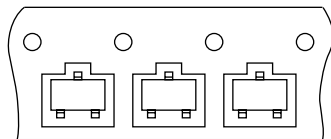
There are two different size reels in CMPAK packaging.

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**

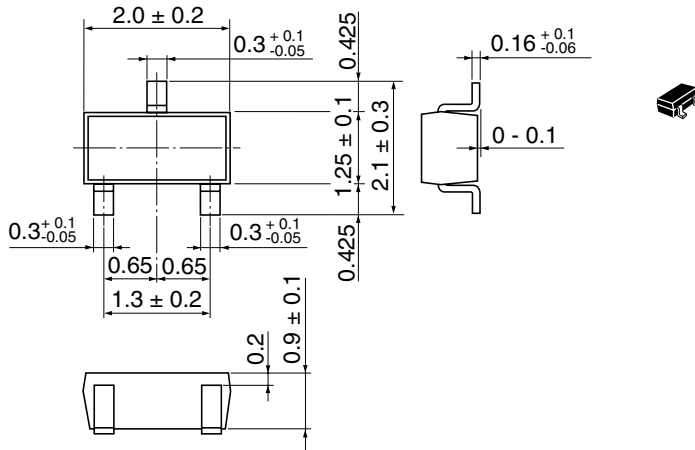


Marking face is up.  
Center lead goes to left.

Direction of feed 

Package Dimensions

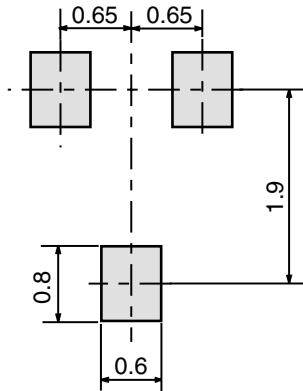
As of January, 2001  
Unit: mm



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

Footprint

CMPAK



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