

# 40871, 40872

## Epitaxial-Base, Silicon N-P-N and P-N-P VERSAWATT Transistors

General-Purpose Types for Medium-Power Switching and Amplifier Service in Consumer, Automotive, and Industrial Applications

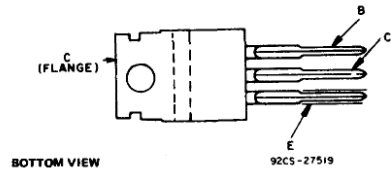
RCA-40871 is an epitaxial-base silicon n-p-n transistor. RCA-40872 is an epitaxial-base p-n-p transistor. These devices are intended for a wide variety of medium-power switching and amplifier applications, such as switching

regulators and inverters and driver and output stages of high-fidelity amplifiers. These plastic power transistors are supplied in the JEDEC TO-220AB VERSAWATT package.

**Features:**

- Low saturation voltage
- VERSAWATT package
- Maximum safe-operating-area curves
- Thermal-cycling ratings

**TERMINAL DESIGNATIONS**



JEDEC TO-220AB

**MAXIMUM RATINGS, Absolute-Maximum Values:**

N-P-N	40871
P-N-P	40872*

**COLLECTOR-TO-EMITTER SUSTAINING VOLTAGE:**

With external base-to-emitter resistance ( $R_{BE}$ ) = 100 $\Omega$	$V_{CER(sus)}$	120	V
With base open	$V_{CEO(sus)}$	100	V

EMITTER-TO-BASE VOLTAGE	$V_{EBO}$	5	V
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COLLECTOR CURRENT (Continuous)	$I_C$	7	A
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BASE CURRENT (Continuous)	$I_B$	3	A
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TRANSISTOR DISSIPATION:	$P_T$		
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At case temperatures up to 25°C		40	W
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At ambient temperatures up to 25°C		1.8	W
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At case temperatures above 25°C	Derate linearly at 0.32W/°C		
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At ambient temperatures above 25°C	Derate linearly at 0.0144 W/°C		
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TEMPERATURE RANGE:			
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Storage & Operating (Junction)		-65 to 150	°C
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LEAD TEMPERATURE (During Soldering):			
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At distance $\geq$ 1/8 in. (3.17 mm) from case for 10 s max.		235	°C
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\* For p-n-p device, voltage and current values are negative.

**ELECTRICAL CHARACTERISTICS, At Case Temperature ( $T_C$ ) = 25°C, Unless Otherwise Specified**

CHARACTERISTIC	SYMBOL	TEST CONDITIONS				LIMITS		UNITS
		VOLTAGE		CURRENT		40871		
		V dc	A dc	40872*	MIN.	MAX.		
Collector-Cutoff Current: With external base-to-emitter resistance ( $R_{BE}$ ) = 100 $\Omega$	$I_{CER}$	110				-	1	mA
Emitter-Cutoff Current	$I_{EBO}$	5	0			-	1	mA
Collector-to-Emitter Sustaining Voltage: With base open	$V_{CEO(sus)}$		0.1	0	100	-		V
With external base-to-emitter resistance ( $R_{BE}$ ) = 100 $\Omega$	$V_{CER(sus)}$		0.1		120	-		V
DC Forward-Current Transfer Ratio	$h_{FE}$	4		1*	50	250		
		4						
		4						
Base-to-Emitter Voltage	$V_{BE}$	4		1*	-	1.5		V
		4			-	-		
		4			-	-		
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)}$			1*	0.1	-	1.0	V
Gain-Bandwidth Product	$f_T$	4		0.5	4	-		MHz
Thermal Resistance:	$R_{\theta JC}$ $R_{\theta JA}$						3.125	°C/W
							70	

\* For p-n-p devices, voltage and current values are negative.

■ Pulsed: Pulse duration = 300  $\mu$ s, duty factor = 0.018.

CAUTION: The sustaining voltages  $V_{CEO(sus)}$  and  $V_{CER(sus)}$  MUST NOT be measured on a curve tracer.

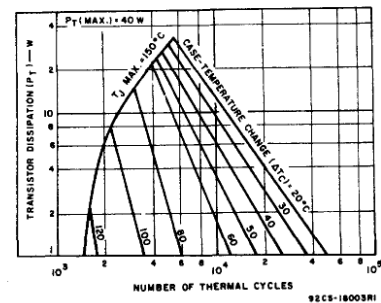


Fig. 1 - Thermal-cycling ratings for both types.

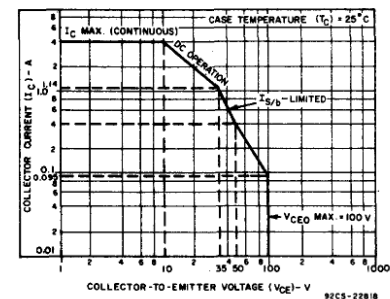


Fig. 2 - Maximum operating areas for 40871.

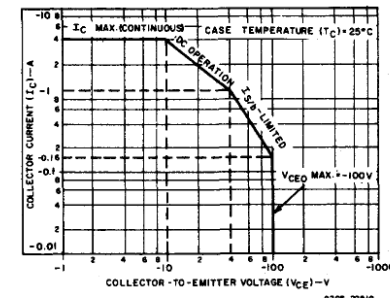


Fig. 3 - Maximum operating areas for 40872.

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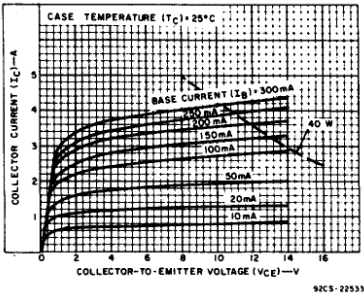


Fig. 4 - Typical output characteristics for 40871.

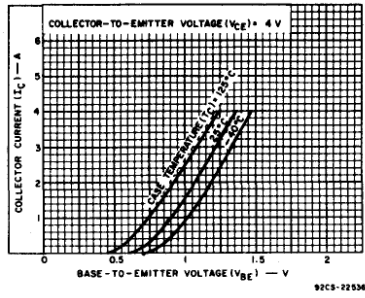


Fig. 5 - Typical transfer characteristics for 40871.

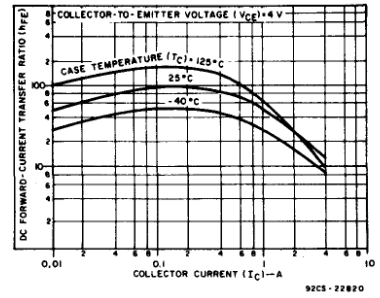


Fig. 6 - Typical dc beta characteristics for 40871.

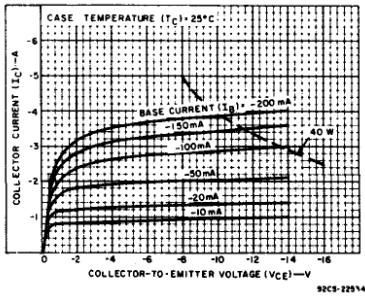


Fig. 7 - Typical output characteristics for 40872.

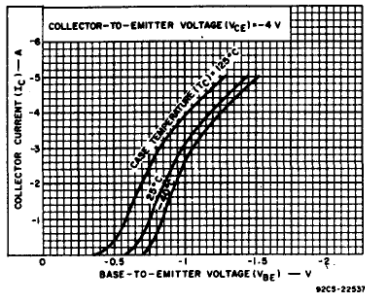


Fig. 8 - Typical transfer characteristics for 40872.

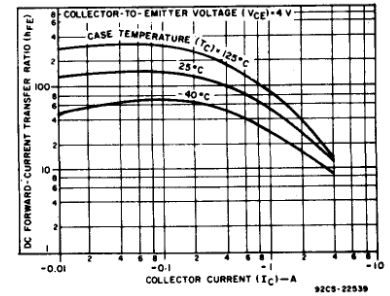


Fig. 9 - Typical dc beta characteristics for 40872.