

(NPN) S8050 Transistor

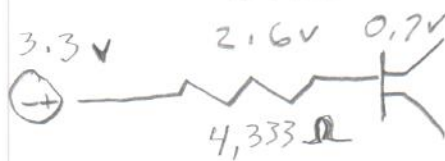
$$\beta = \beta_{\text{Beta}} = 100$$

$$\beta = \frac{I_c}{I_b} \quad I_b = \frac{I_c}{\beta} = \frac{0.060}{100} = 0.0006 \text{ A}$$

GPIO 3.3V

Transistor is 0.7V

$$R = \frac{V}{I} \quad \frac{3.3 - 0.7}{0.0006} = 4,333 \Omega$$





■ **ABSOLUTE MAXIMUM RATING** ( $T_A=25^\circ\text{C}$ , unless otherwise specified )

PARAMETER	SYMBOL	RATINGS	UNIT
Collector-Base Voltage	$V_{CBO}$	30	V
Collector-Emitter Voltage	$V_{CEO}$	20	V
Emitter-Base Voltage	$V_{EBO}$	5	V
Collector Current	$I_C$	700	mA
Collector Dissipation( $T_A=25^\circ\text{C}$ )	$P_C$	1	W
Junction Temperature	$T_J$	150	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-65 ~ +150	$^\circ\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ **ELECTRICAL CHARACTERISTICS** ( $T_A=25^\circ\text{C}$ , unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Collector-Base Breakdown Voltage	$BV_{CBO}$	$I_C=100\mu\text{A}$ , $I_E=0$	30			V
Collector-Emitter Breakdown Voltage	$BV_{CEO}$	$I_C=1\text{mA}$ , $I_B=0$	20			V
Emitter-Base Breakdown Voltage	$BV_{EBO}$	$I_E=100\mu\text{A}$ , $I_C=0$	5			V
Collector Cut-Off Current	$I_{CBO}$	$V_{CB}=30\text{V}$ , $I_E=0$			1	$\mu\text{A}$
Emitter Cut-Off Current	$I_{EBO}$	$V_{EB}=5\text{V}$ , $I_C=0$			100	nA
DC Current Gain	$h_{FE1}$	$V_{CE}=1\text{V}$ , $I_C=1\text{mA}$	100			
	$h_{FE2}$	$V_{CE}=1\text{V}$ , $I_C=150\text{mA}$	120		400	
	$h_{FE3}$	$V_{CE}=1\text{V}$ , $I_C=500\text{mA}$	40			
Collector-Emitter Saturation Voltage	$V_{CE(SAT)}$	$I_C=500\text{mA}$ , $I_B=50\text{mA}$			0.5	V
Base-Emitter Saturation Voltage	$V_{BE(SAT)}$	$I_C=500\text{mA}$ , $I_B=50\text{mA}$			1.2	V
Base-Emitter Saturation Voltage	$V_{BE}$	$V_{CE}=1\text{V}$ , $I_C=10\text{mA}$			1.0	V
Current Gain Bandwidth Product	$f_T$	$V_{CE}=10\text{V}$ , $I_C=50\text{mA}$	100			MHz
Output Capacitance	$C_{ob}$	$V_{CB}=10\text{V}$ , $I_E=0$ , $f=1\text{MHz}$		9.0		pF

■ **CLASSIFICATION OF  $h_{FE2}$**

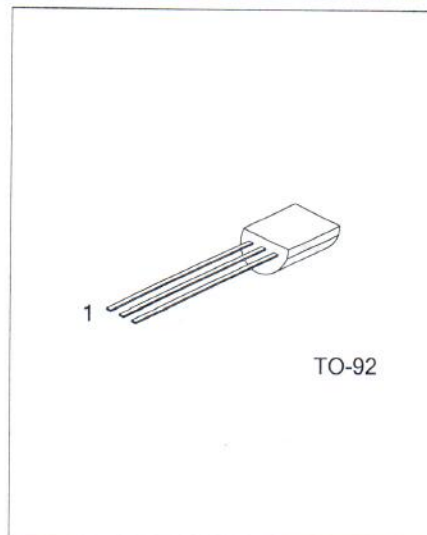
RANK	C	D	E
RANGE	120-200	160-300	280-400

**S8050****NPN SILICON TRANSISTOR****LOW VOLTAGE HIGH  
CURRENT SMALL SIGNAL  
NPN TRANSISTOR****■ DESCRIPTION**

The UTC **S8050** is a low voltage high current small signal NPN transistor, designed for Class B push-pull audio amplifier and general purpose applications.

**■ FEATURES**

- \* Collector current up to 700mA
- \* Collector-Emitter voltage up to 20 V
- \* Complementary to S8550

**■ ORDERING INFORMATION**

Order Number		Package	Pin Assignment			Packing
Lead Free Plating	Halogen Free		1	2	3	
S8050L-x-T92-B	S8050G-x-T92-B	TO-92	E	B	C	Tape Box
S8050L-x-T92-K	S8050G-x-T92-K	TO-92	E	B	C	Bulk

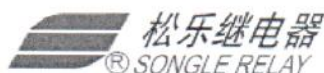
Note: Pin Assignment: E: Emitter    B: Base    C: Collector

	(1) Packing Type	(1) B: Tape Box, K: Bulk
	(2) Package Type	(2) T92: TO-92
	(3) Rank	(3) x: refer to Classification of $h_{FE2}$
	(4) Lead Plating	(4) L: Lead Free, G: Halogen Free

**■ MARKING INFORMATION**

PACKAGE	MARKING
TO-92	<div>UTC S8050 □ 1</div> <div>L: Lead Free G: Halogen Free Data Code</div>

# SONGLE RELAY



RELAY ISO9002

SRS/SRSZ



## 1. MAIN FEATURES

- ☐ Subminiature Type.
- ☐ Silver or Silver Alloy Contacts with Gold Plated.
- ☐ Low Dissipation.
- ☐ Sealed Type Available.
- ☐ Design conforms to foreign safety standard UL, CUL, TUV

## 2. APPLICATIONS

Microprocessor Control, Store Program Exchanger and Household Appliance.

## 3. ORDERING INFORMATION

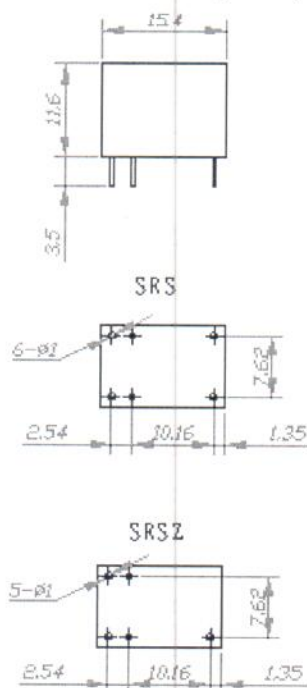
SRS/SRSZ	XX VDC	S	L
Model of relay	Nominal coil voltage	Structure	Coil sensitivity
SRS/SRSZ	03D5D6D9#2E4VDC	S: Sealed type	H: 0.20W
		F: Flux free type	L: 0.36W
			D: 0.45W

## 4. RATING

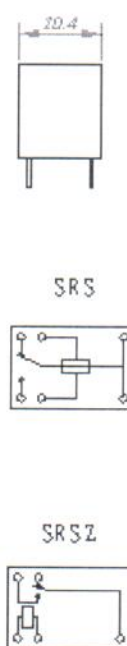
UL/CUL FILE NUMBER: E167996 1A/120VAC 24VDC  
 TUV FILE NUMBER: R50056114 3A/250VAC 30VDC  
 3A/120VAC 24VDC

## 5. DIMENSION (unit:mm)

### DRILLING (unit:mm)



### WIRING DIAGRAM





## 6. COIL DATA CHART (AT20 ° C)

Coil Sensitivity	Coil Voltage Code	Nominal Voltage (VDC)	Nominal Current (mA)	Coil Resistance ( $\Omega$ ) $\square$	Power Consumption (W)	Pull-In Voltage (VDC)	Drop-Out Voltage (VDC)	Max-Allowable Voltage (VDC)
SRS(Z) (High Sensitivity)	03	03	66.7	10% 45	abt. 0.2 W	75% Max.	5% Min.	110%
	05	05	40	125				
	06	06	33.3	180				
	09	09	22.2	405				
	12	12	16.7	720				
SRS(Z) (Standard)	24	24	8.3	2880	abt. 0.36W	75% Max.	5% Min.	110%
	03	03	120	25				
	05	05	66.7	75				
	06	06	60	100				
	09	09	40.9	220				
	12	12	30	400				
SRS(Z) (Normal Sensitivity)	24	24	15	1600	abt. 0.45W	75% Max.	5% Min.	110%
	03	03	150	20				
	05	05	89.3	56				
	06	06	75	80				
	09	09	50	180				
	12	12	37.5	320				
	24	24	18.75	1280				

## 7. CONTACT RATING

Item	Type	SRS/SRSZ 1 Amp type	SRS/SRSZ 1 Amp type
Contact Capacity		Coil=0.2W	Coil=0.2W
Resistive Load ( $\cos\phi=1$ )		1A 125VAC	3A 250VAC
		1A 30VDC	1A 30VDC
Inductive Load		0.3A 125VAC	0.3A 250VAC
( $\cos\phi=0.4$ L/R=7msec)		0.3A 30VDC	0.3A 30VDC
Rated Carrying Current		1 A	1 A
Contact Material		Ag Alloy	Ag Alloy

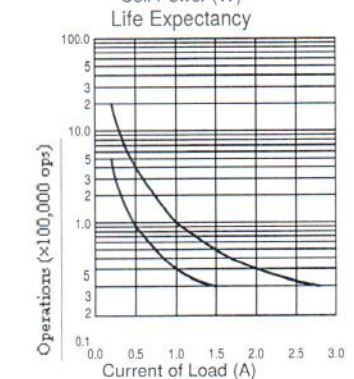
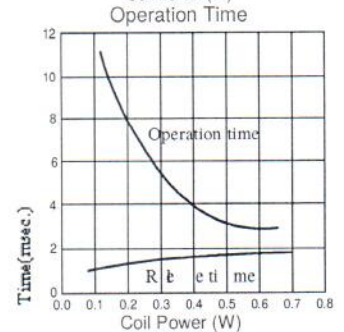
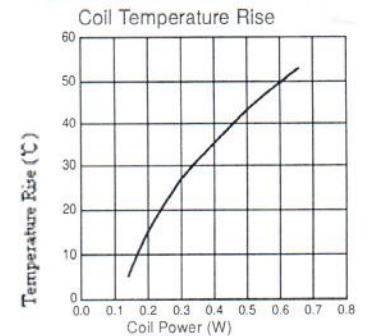
## 8. PERFORMANCE (at initial value)

Item	Type	SRS/SRSZ
Contact Resistance		100m $\Omega$ Max.
Operation Time		10msec Max.
Release Time		5msec Max.
Dielectric Strength		
Between coil & contact		500VAC 50/60HZ (1 minute)
Between contacts		500VAC 50/60HZ (1 minute)
Insulation Resistance		100 M $\Omega$ Min. (500VDC)
Max. ON/OFF Switching		
Mechanically		300 operation/min
Electrically		30 operation/min
Operating Ambient Temperature		-25 $\square$ C to +70 $\square$ C
Operating Humidity		45 to 85% RH
Vibration Endurance		10 to 55HZ Single Amplitude 0.35mm
Error Operation		10 to 55HZ Single Amplitude 0.35mm
Shock Endurance		50G Min.
Error Operation		10G Min.
Life Expectancy		10 <sup>7</sup> operations. Min. (no load)
Mechanically		10 <sup>5</sup> operations. Min. (at rated coil voltage)
Electrically		

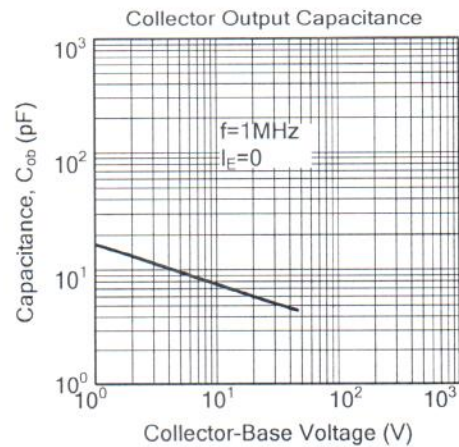
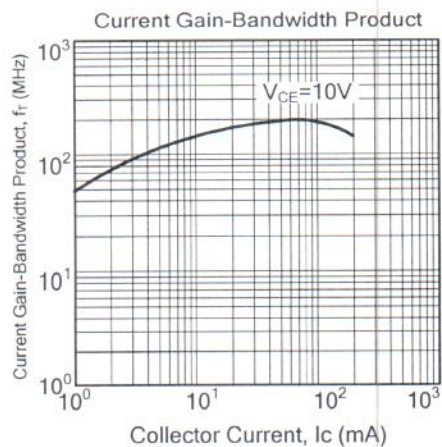
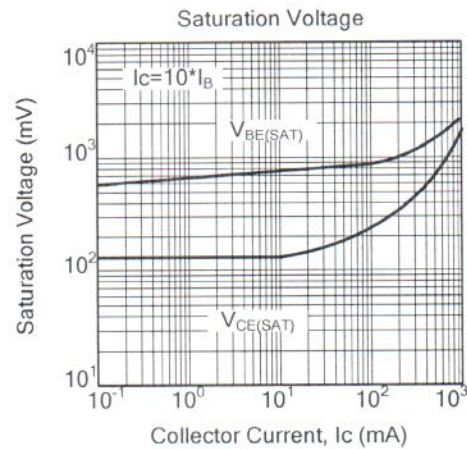
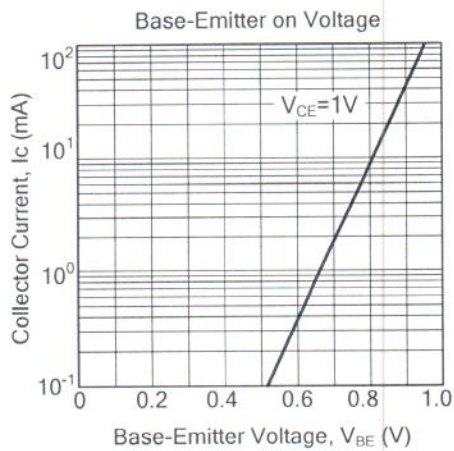
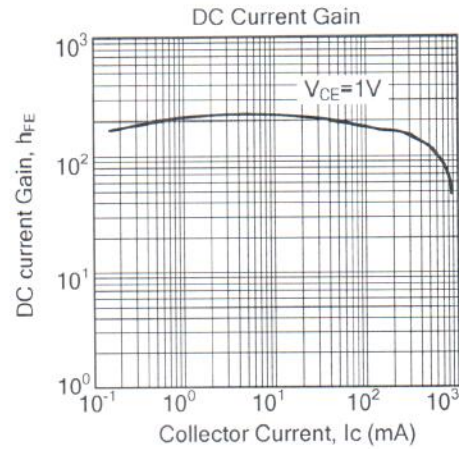
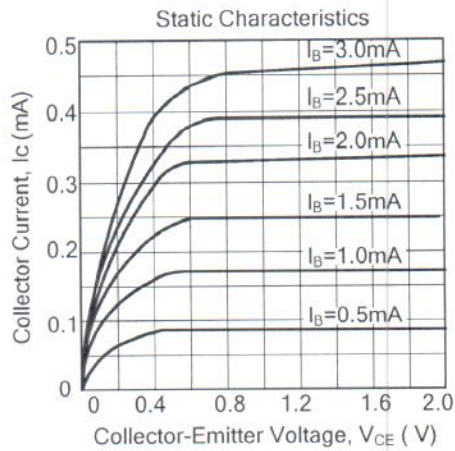
Weight

abt. 4grs.

## 9. REFERENCE DATA



# ■ TYPICAL CHARACTERISTICS



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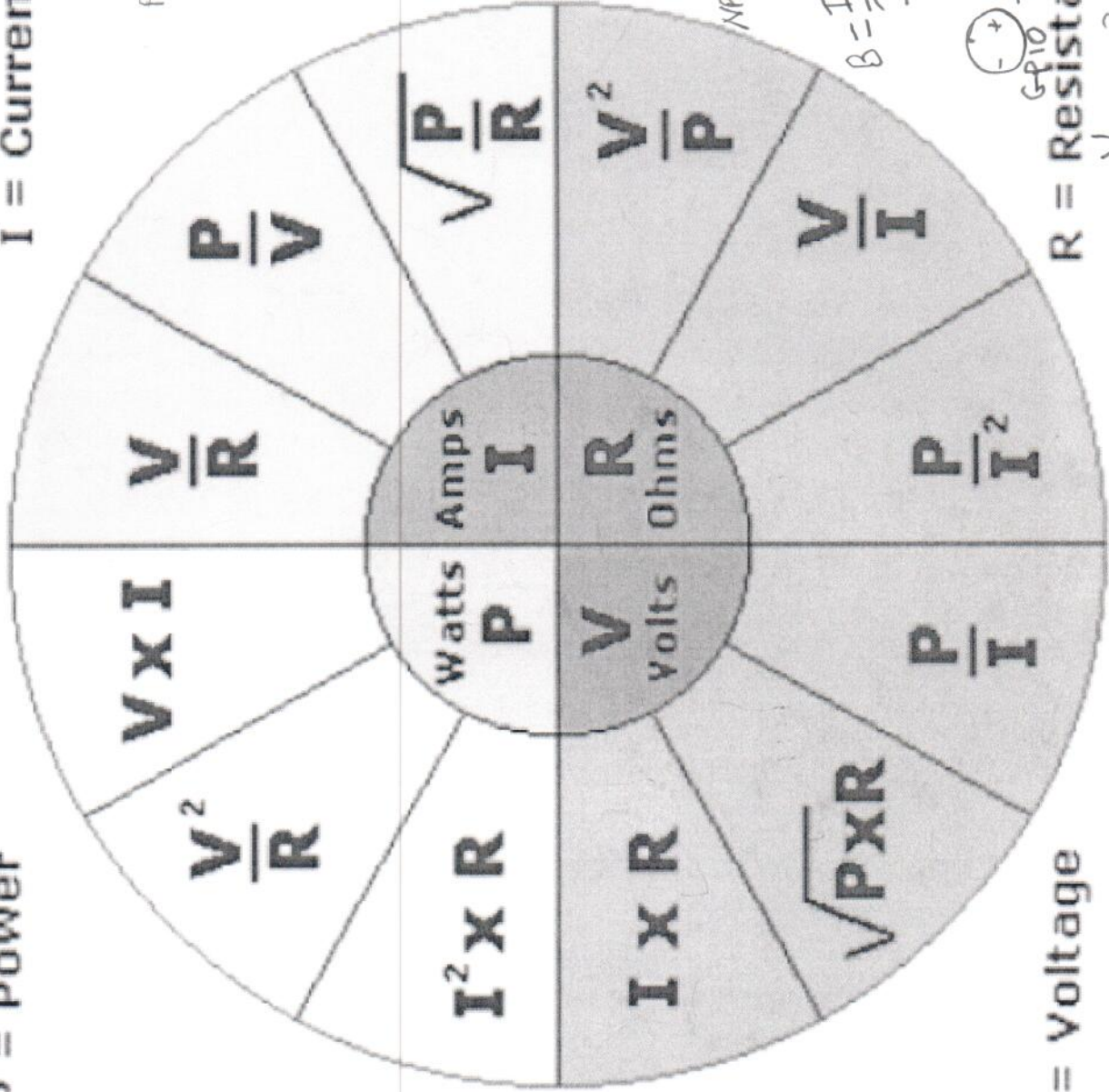


# Ohm's law

P = Power

I = Current

V = Voltage



1650  
1000  
1000

Pi 16 Ma  
.016 x 3v  
.048

SONGLE

3A 30V

90W

coil

5V (60MA) 100R

NPN-S8050 Transistor

Beta = 100

$$\beta = \frac{I_c}{I_b} \quad I_b = \frac{I_c}{\beta} = \frac{0.60}{100} = .006$$

Load (resistor)



GP10 3.3V

R = Resistance

$$R = \frac{V}{I} = \frac{3.3 - 0.7}{0.006} = 477\Omega$$





