

2SC1213A(K)

Silicon NPN Epitaxial

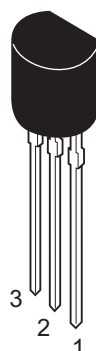
R07DS0432EJ0300
(Previous: REJ03G0685-0200)
Rev.3.00
Jun 07, 2011

Application

- Low frequency amplifier
- Medium speed switching

Outline

RENESAS Package code: PRSS0003DA-A
(Package name: TO-92 (1))



1. Emitter
2. Collector
3. Base

Absolute Maximum Ratings

(Ta = 25°C)

Item	Symbol	Ratings	Unit
Collector to base voltage	V_{CBO}	50	V
Collector to emitter voltage	V_{CEO}	50	V
Emitter to base voltage	V_{EBO}	4	V
Collector current	I_C	500	mA
Collector power dissipation	P_C	400	mW
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

Electrical Characteristics

(Ta = 25°C)

Item	Symbol	Min	Typ	Max	Unit	Test conditions
Collector to base breakdown voltage	$V_{(BR)CBO}$	50	—	—	V	$I_C = 10\ \mu A, I_E = 0$
Collector to emitter breakdown voltage	$V_{(BR)CEO}$	50	—	—	V	$I_C = 1.0\ mA, R_{BE} = \infty$
Emitter to base breakdown voltage	$V_{(BR)EBO}$	4	—	—	V	$I_E = 10\ \mu A, I_C = 0$
Collector cutoff current	I_{CBO}	—	—	0.5	μA	$V_{CB} = 20\ V, I_E = 0$
DC current transfer ratio	h_{FE}^{*1}	100	—	320		$V_{CE} = 3\ V, I_C = 10\ mA$
	h_{FE}	10	—	—		$V_{CE} = 3\ V, I_C = 500\ mA^{*2}$
Base to emitter voltage	V_{BE}		0.64	—	V	$V_{CE} = 3\ V, I_C = 10\ mA$
Collector to emitter saturation voltage	$V_{CE(sat)}$	—	0.12	0.6	V	$I_C = 150\ mA, I_B = 15\ mA^{*2}$
Base to emitter saturation voltage	$V_{BE(sat)}$	—	0.83	1.2	V	$I_C = 150\ mA, I_B = 15\ mA^{*2}$
Collector output capacitance	C_{ob}	—	7.0	—	pF	$V_{CB} = 10\ V, I_E = 0, f = 1\ MHz$
Gain bandwidth product	f_T	—	120	—	MHz	$V_{CE} = 3\ V, I_C = 10\ mA$
Turn on time	t_{on}	—	0.25	—	μS	$V_{CC} = 10.3\ V$ $I_C = 10\ mA, I_{B1} = -10\ mA, I_{B2} = 10\ mA$
Turn off time	t_{off}	—	0.85	—	μS	
Storage time	t_{stg}	—	0.4	—	μS	$V_{CC} = 5\ V$ $I_C = I_{B1} = -I_{B2} = 20\ mA$

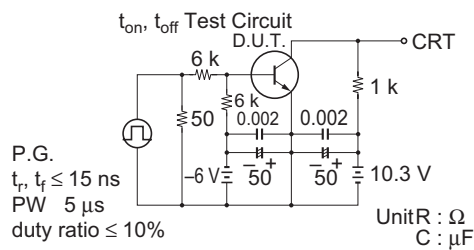
Notes: 1. The 2SC1213A(K) is grouped by h_{FE} as follows.

2. Pulse test

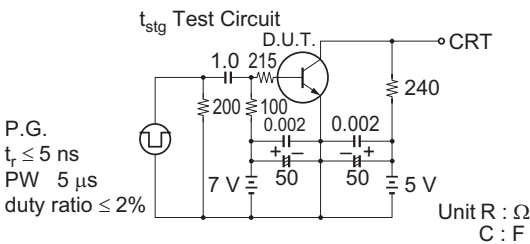
C	D
100 to 200	160 to 320

Main Characteristics

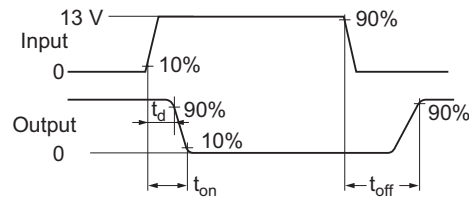
Switching Time Test Circuit



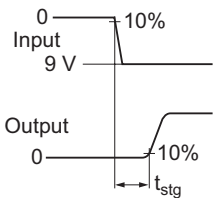
Switching Time Test Circuit



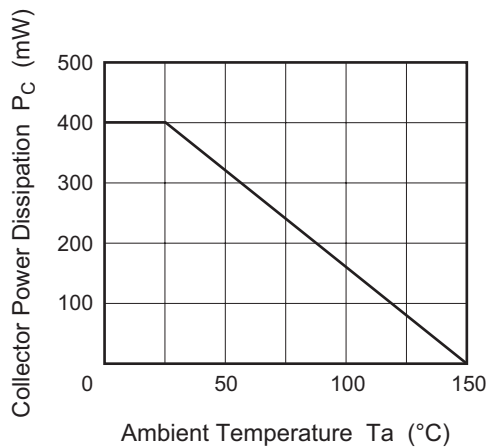
Response Waveform



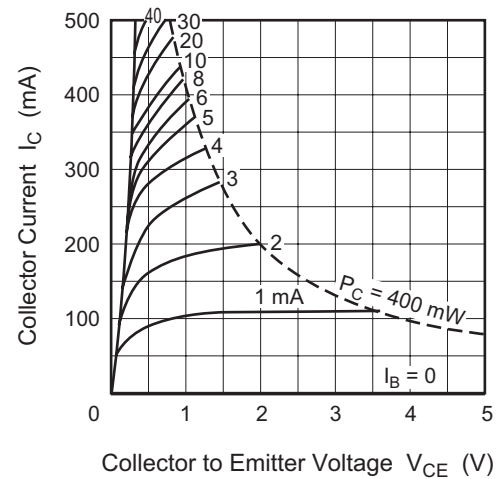
Response Waveform



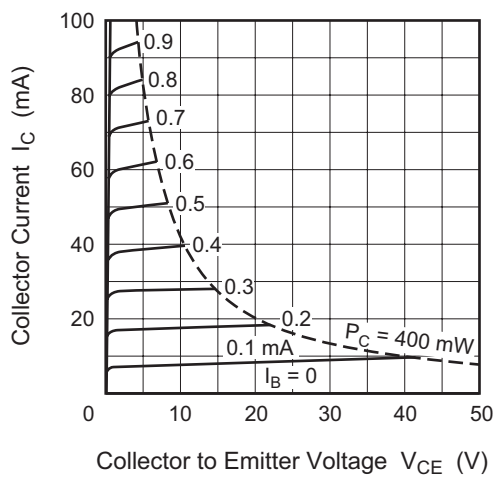
Maximum Collector Dissipation Curve



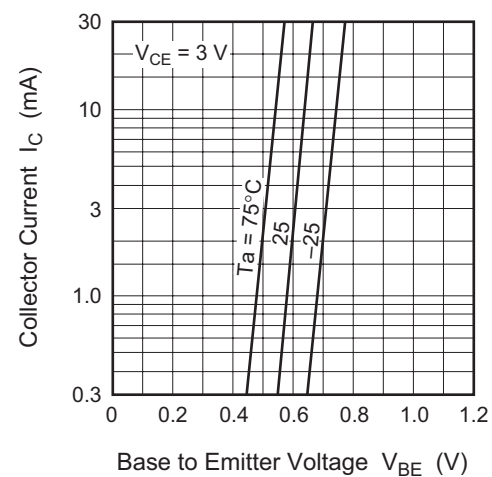
Typical Output Characteristics (1)



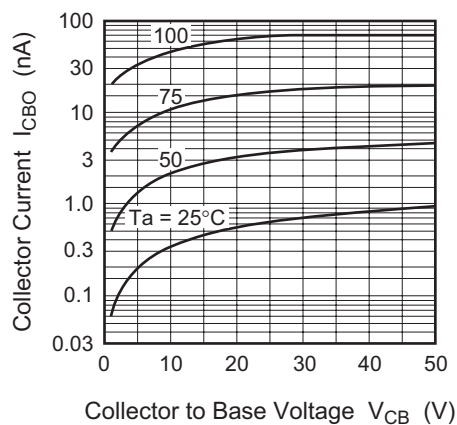
Typical Output Characteristics (2)



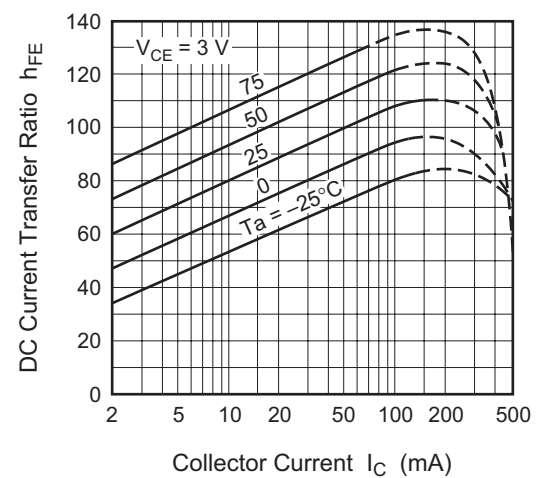
Typical Transfer Characteristics

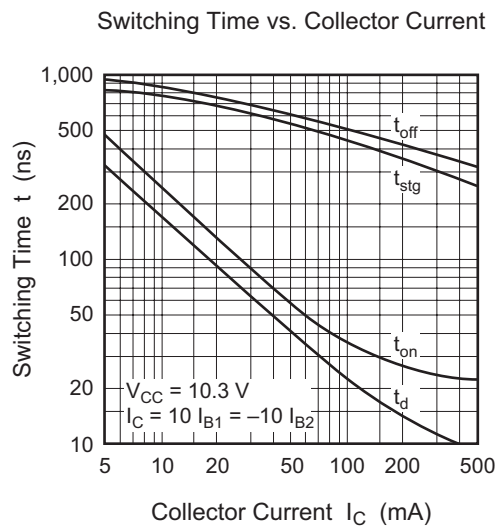
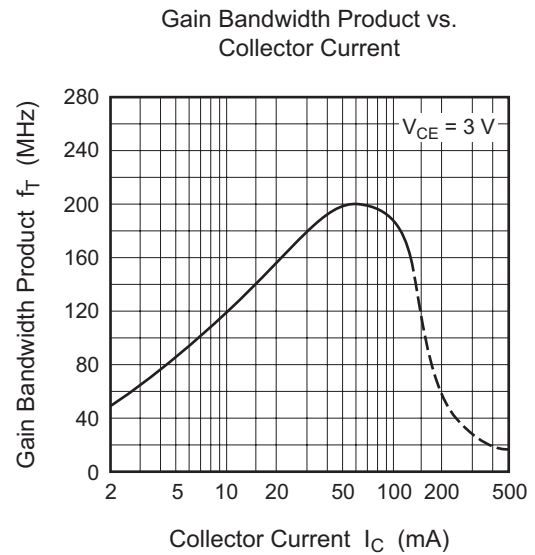
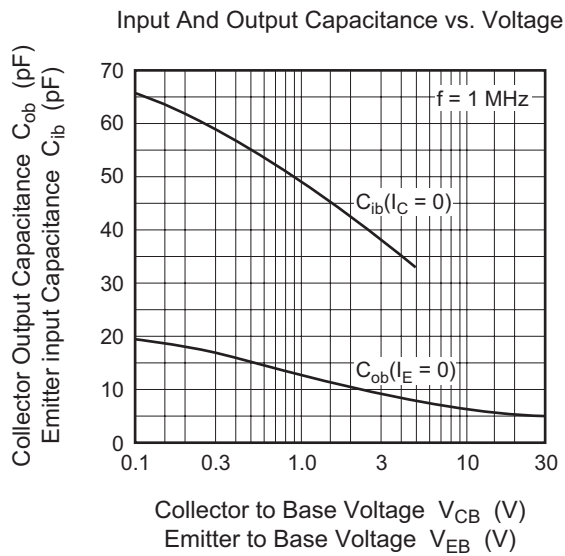
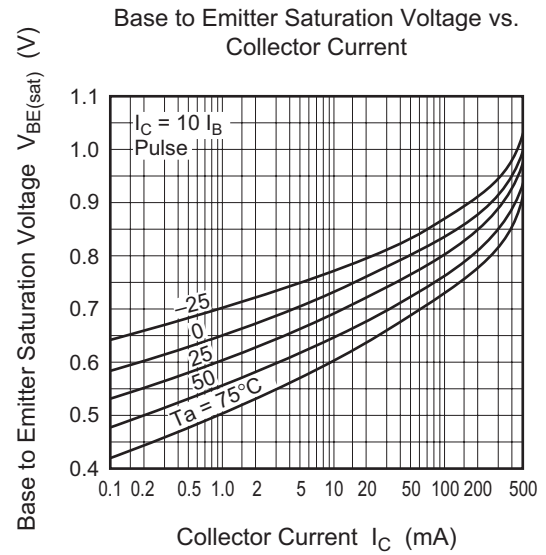
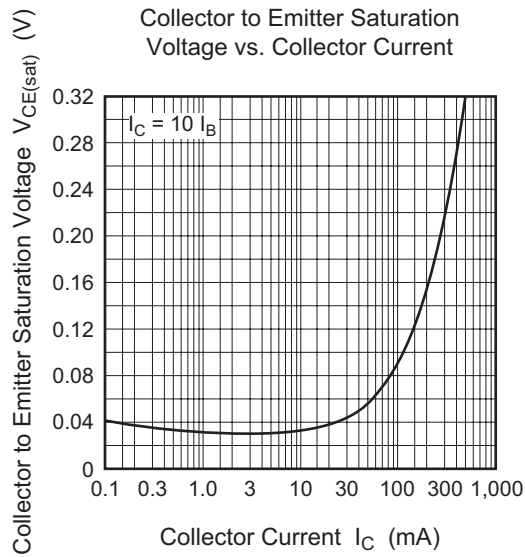


Collector Cutoff Current vs. Collector to Base Voltage

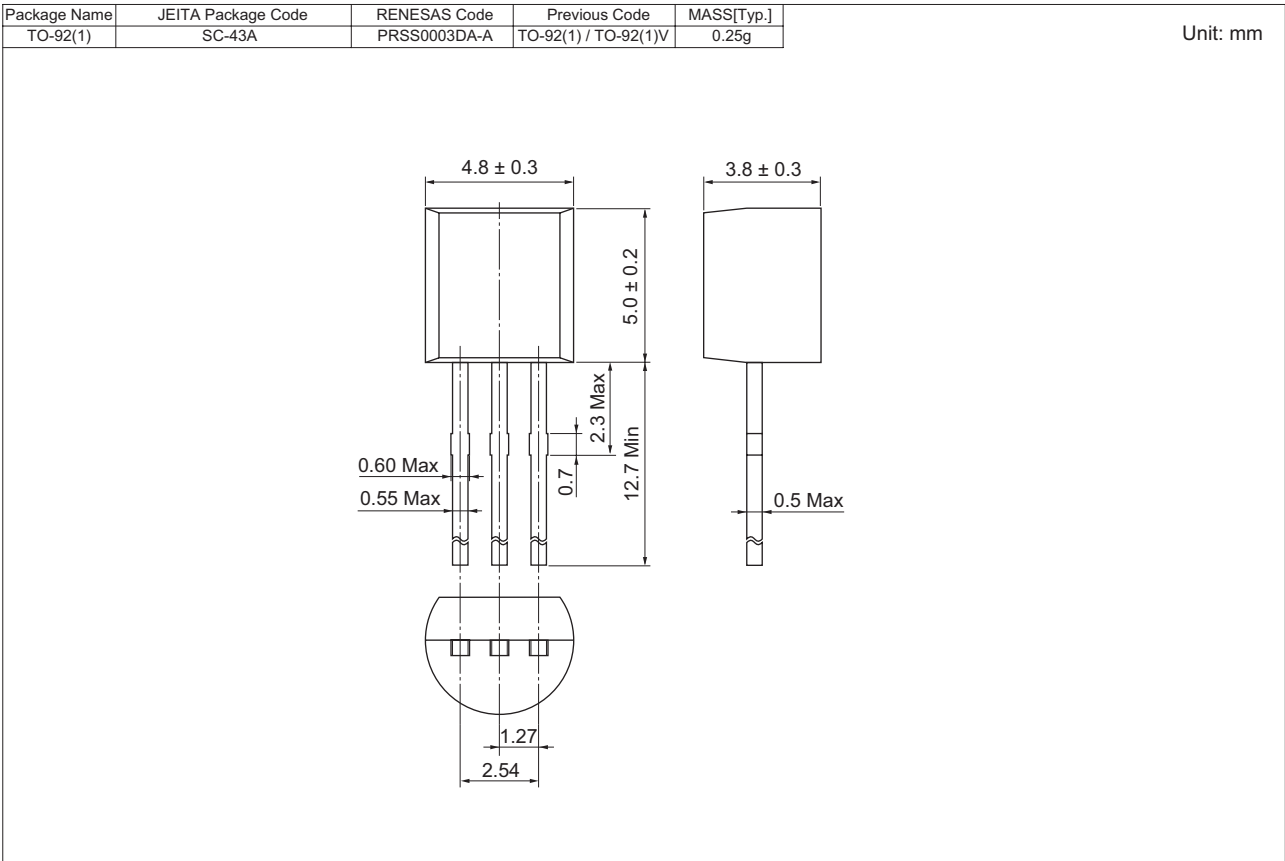


DC Current Transfer Ratio vs. Collector Current





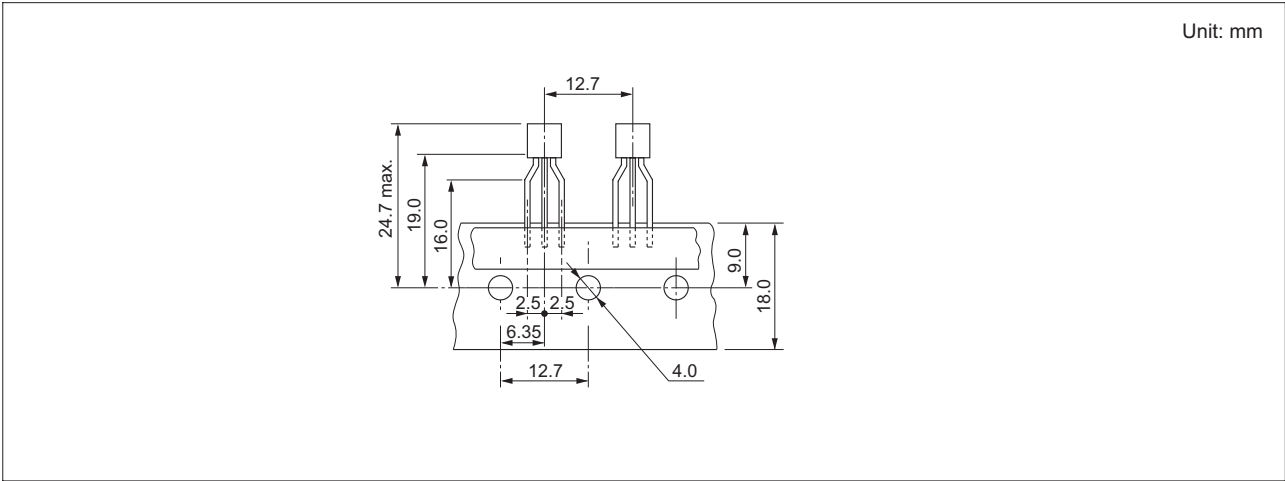
Package Dimensions



Ordering Information

Part Name	Quantity	Shipping Container
2SC1213AKCTZ-E	2500	Hold Box, Radial Taping

- Notes: 1. For some grades, production may be terminated. Please contact the Renesas sales office to check the state of production before ordering the product.
2. Leads is forming applied as following figure.



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