

To our customers,

Old Company Name in Catalogs and Other Documents

On April 1st, 2010, NEC Electronics Corporation merged with Renesas Technology Corporation, and Renesas Electronics Corporation took over all the business of both companies. Therefore, although the old company name remains in this document, it is a valid Renesas Electronics document. We appreciate your understanding.

Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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NPN SILICON EPITAXIAL TRANSISTOR
POWER MINI MOLD

DESCRIPTION

2SD1615, 1615A are designed for audio frequency power amplifier and switching application, especially in Hybrid Integrated Circuits.

FEATURES

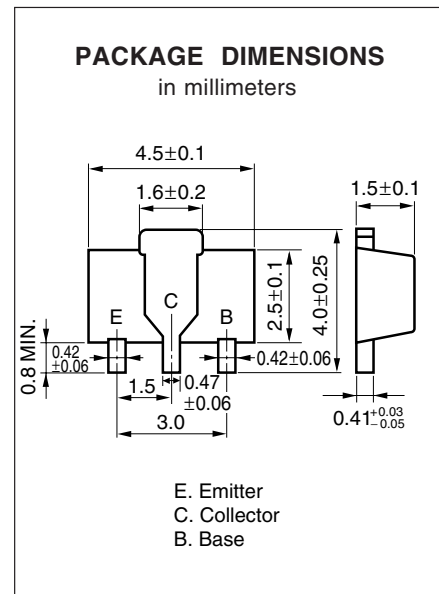
- Low $V_{CE(sat)}$ $V_{CE(sat)} = 0.15$ V
- Complement to 2SB1115, 1115A

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$)

	2SD1615	2SD1615A	
Collector to Base Voltage	V_{CBO} 60	120	V
Collector to Emitter Voltage	V_{CEO} 50	60	V
Emitter to Base Voltage	V_{EBO} 6.0		V
Collector Current (DC)	I_C (DC) 1.0		A
Collector Current (Pulse)*	I_C (Pulse) 2.0		A
Total Power Dissipation**	P_T 2.0		W
Junction Temperature	T_j 150		$^\circ\text{C}$
Storage Temperature Range	T_{stg} -55 to +150		$^\circ\text{C}$

* $PW \leq 10$ ms, Duty Cycle $\leq 50\%$

** When mounted on ceramic substrate of $16\text{ cm}^2 \times 0.7$ mm



ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector Cutoff Current	I_{CBO}			100	nA	2SD1615 $V_{CB} = 60$ V, $I_E = 0$
				100	nA	2SD1615A $V_{CB} = 120$ V, $I_E = 0$
Emitter Cutoff Current	I_{EBO}			100	nA	$V_{EB} = 6.0$ V, $I_C = 0$
DC Current Gain	h_{FE1}^{***}	135	290	600		2SD1615 $V_{CE} = 2.0$ V, $I_C = 100$ mA
		135		400		
DC Current Gain	h_{FE2}^{***}	81	270			$V_{CE} = 2.0$ V, $I_C = 1.0$ A
Collector Saturation Voltage	$V_{CE(sat)}^{***}$		0.15	0.3	V	$I_C = 1.0$ A, $I_B = 50$ mA
Base Saturation Voltage	$V_{BE(sat)}^{***}$		0.9	1.2	V	$I_C = 1.0$ A, $I_B = 50$ mA
Base to Emitter Voltage	V_{BE}^{***}	600		700	mV	$V_{CE} = 2.0$ V, $I_C = 50$ mA
Gain Bandwidth Product	f_T	80	160		MHz	$V_{CE} = 2.0$ V, $I_E = -100$ mA
Output Capacitance	C_{ob}		19		pF	$V_{CB} = 10$ V, $I_E = 0$, $f = 1.0$ MHz

*** Pulsed: $PW \leq 350$ μs , Duty Cycle $\leq 2\%$

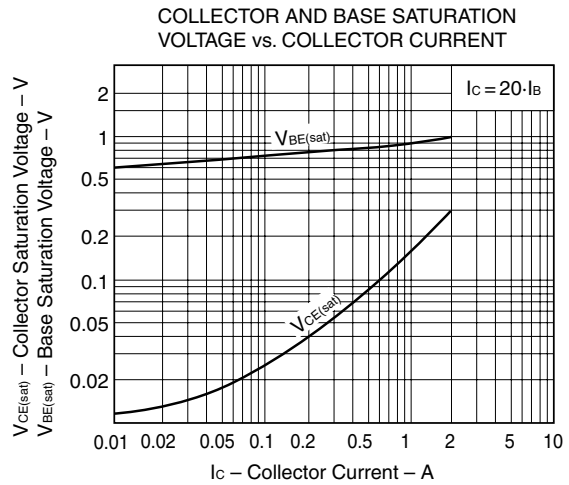
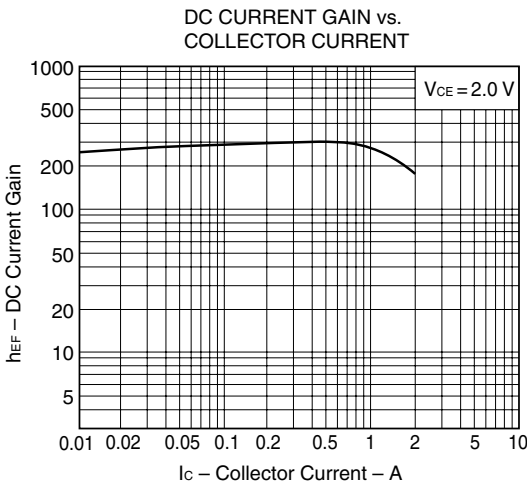
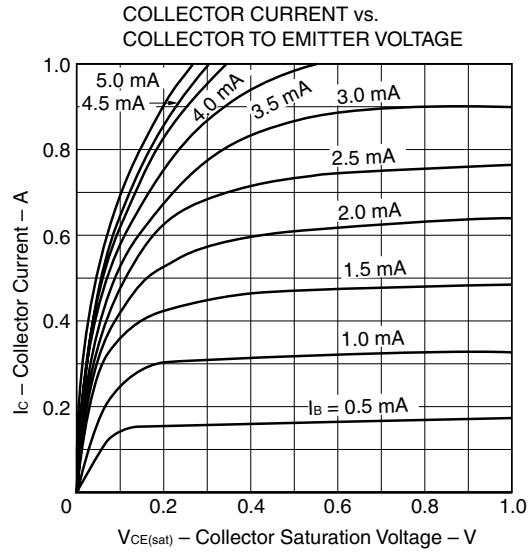
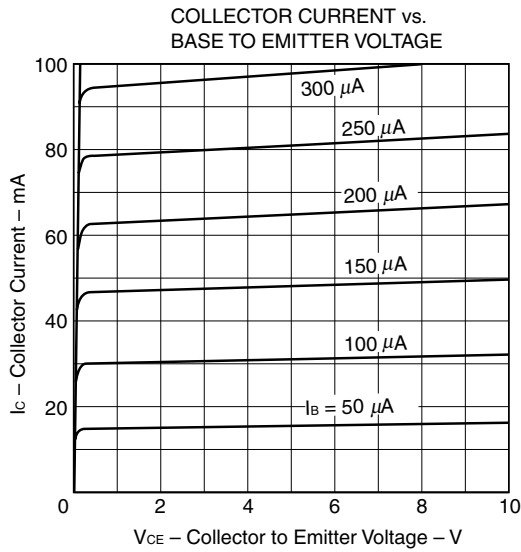
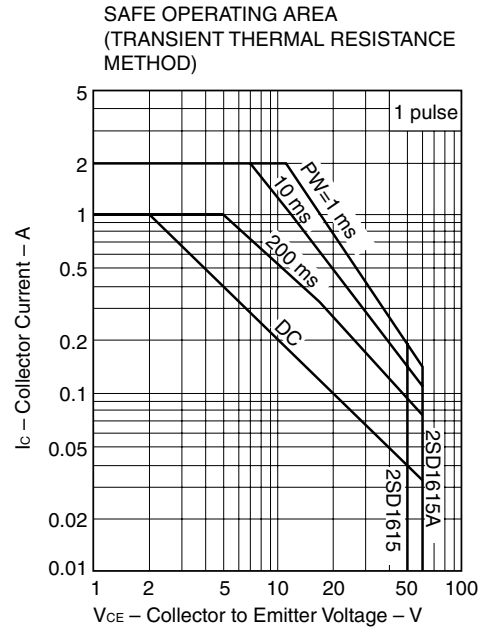
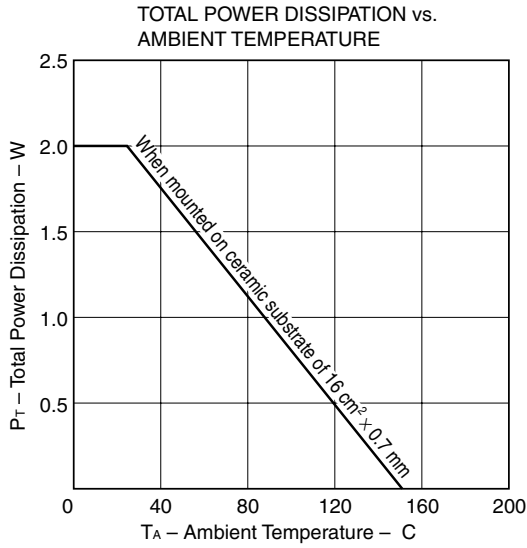
h_{FE} Classification

MARKING	2SD1615	GM	GL	GK
	2SD1615A	GQ	GP	
h_{FE1}		135 to 270	200 to 400	300 to 600

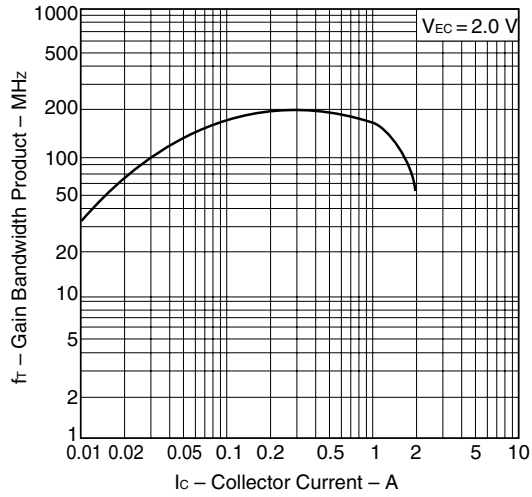
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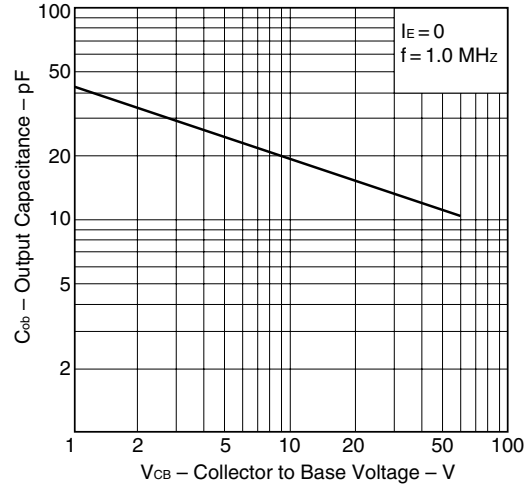
TYPICAL CHARACTERISTICS (T_A = 25°C)



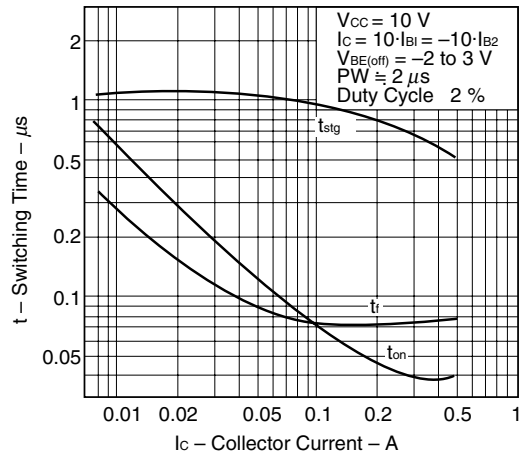
GAIN BANDWIDTH PRODUCT vs. EMITTER CURRENT



OUTPUT CAPACITANCE vs. COLLECTOR TO BASE VOLTAGE



SWITCHING TIME vs. COLLECTOR CURRENT



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