DCX100NS

100mA DUAL COMPLEMENTARY PRE-BIASED TRANSISTORS

NEW PRODUCT

General Description

DCX100NS is best suited for applications where the load needs to be turned on and off using control circuits like micro-controllers, comparators etc. particularly at a point of load. It features a discrete PNP pass transistor which can support continuous maximum current up to 100 mA. It also contains an NPN transistor which can be used as a control switch and also it can be biased using higher supply. The component devices can be used as part of a circuit or as stand alone discrete devices.

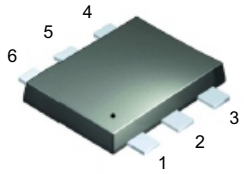

Fig. 1: SOT-563

Features

- Built in Biasing Resistors
- Epitaxial Planar Die Construction
- **Lead Free By Design/ROHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Ideally Suited for Automated Assembly Processes**

Mechanical Data

- Case: SOT-563
- Case Material: Molded Plastic. "Green Molding" Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminal Connections: See Fig. 2
- Terminals: Finish - Matte Tin annealed over Alloy 42 leadframe. Solderable per MIL-STD-202, Method 208
- Marking & Type Code Information: See Page 5
- Ordering Information: See Page 5 and 6
- Weight: 0.005 grams (approximate)

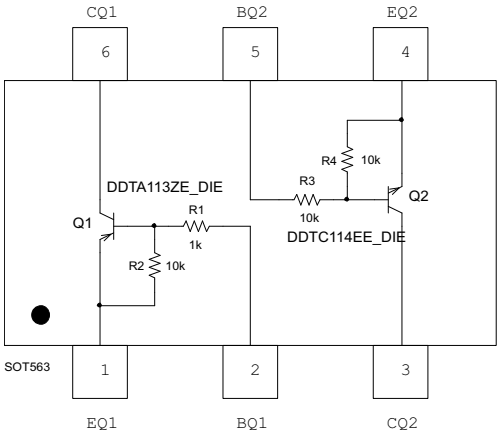

Fig. 2: Schematic and Pin Configuration

Sub-Component P/N	Reference	Device Type	R1 (NOM)	R2 (NOM)	R3, R4 (NOM)	Figure
DDTA113ZE_DIE	Q1	PNP	1K	10K		2
DDTC114EE_DIE	Q2	NPN			10K	2

Maximum Ratings: Total Device @ T_A = 25 C unless otherwise specified

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 3)	Pd	150	mW
Thermal Resistance, Junction to Ambient Air (Note 3)	R_{JA}	833	C/W
Operating and Storage Junction Temperature Range	T_j, T_{stg}	-55 to +150	°C
Collector Current (using PNP as Pass Transistor)	$I_{C(max)}$	100	mA

Sub-Component Device - Pre-Biased PNP Transistor @ T_A = 25 C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{cc}	-50	V
Input Voltage	V_{in}	+5 to -10	V
Output Current	I_c	-100	mA

Notes:
1. No purposefully added lead.
2. Diodes Inc.'s "Green" policy can be found on our website at http:/www.diodes.com/products/lead_free/index.php.
3. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch; please see page 6 or as per Diodes Inc. suggested pad layout document AP02001 on our website at http://www.diodes.com/datasheets/ap02001.pdf.

Sub-Component Device - Pre-Biased NPN Transistor @ T_A = 25 C unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{cc}	50	V
Input Voltage	V_{in}	-10 to +40	V
Output Current	I_c	50	mA

Electrical Characteristics: Pre-Biased PNP Transistor @ T_A = 25 C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(off)}$	-0.3			V	V_{CC} = -5V, I_O = -100uA
	$V_{I(on)}$			-3.0	V	V_O = -0.3V, I_O = -20mA
Output Voltage	$V_{O(on)}$		-0.1	-0.3	V	I_O/I_I = -10mA / -0.5mA
Input Current	I_I			-7.2	mA	V_I = -5V
Output Current	$I_{O(off)}$			-0.5	uA	V_{CC} = -50V, V_I = 0V
DC Current Gain	G_I	33				V_O = -5V, I_O = -5mA
Input Resistor Tolerance	R1	-30		+30	%	
Resistor Ratio Tolerance	R2/R1	0.8	1	1.2	%	
Gain-Bandwidth Product	f_T		250		MHz	V_{CE} = -10V, I_E = -5mA, f = 100 MHz

Electrical Characteristics: Pre-Biased NPN Transistor @ T_A = 25 C unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(off)}$	0.5	1.18		V	V_{CC} = 5V, I_O = 100uA
	$V_{I(on)}$		1.85	3	V	V_O = 0.3V, I_O = 10mA
Output Voltage	$V_{O(on)}$		0.1	0.3	V	I_O/I_I = 10mA / 0.5mA
Input Current	I_I			0.88	mA	V_I = 5V
Output Current	$I_{O(off)}$			0.5	uA	V_{CC} = 50V, V_I = 0V
DC Current Gain	G_I	30				V_O = 5V, I_O = 5mA
Input Resistor Tolerance	R1	-30		+30	%	
Resistor Ratio Tolerance	R2/R1	0.8	1	1.2		
Gain-Bandwidth Product	f_T		250		MHz	V_{CE} = 10V, I_E = 5mA, f = 100 MHz

Typical Characteristics @ T_{amb} = 25 C unless otherwise specified

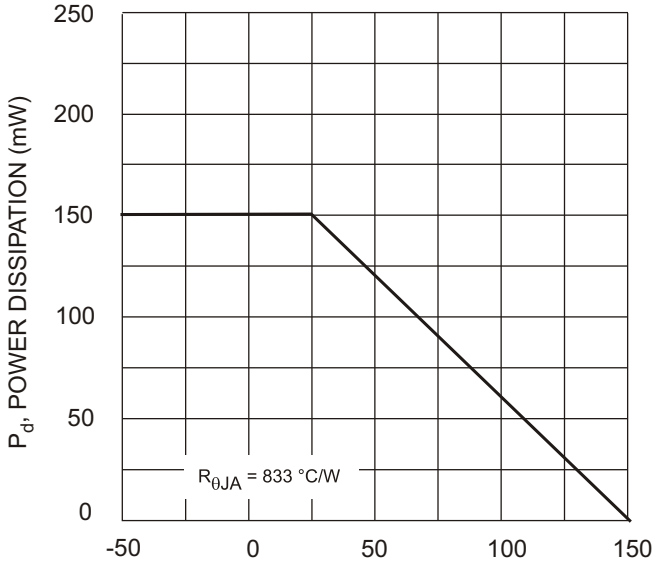

Fig. 3 Power Derating Curve (Total Device)

Characteristics Curves of PNP Transistor (Q1)

@ T_{amb} = 25 C unless otherwise specified

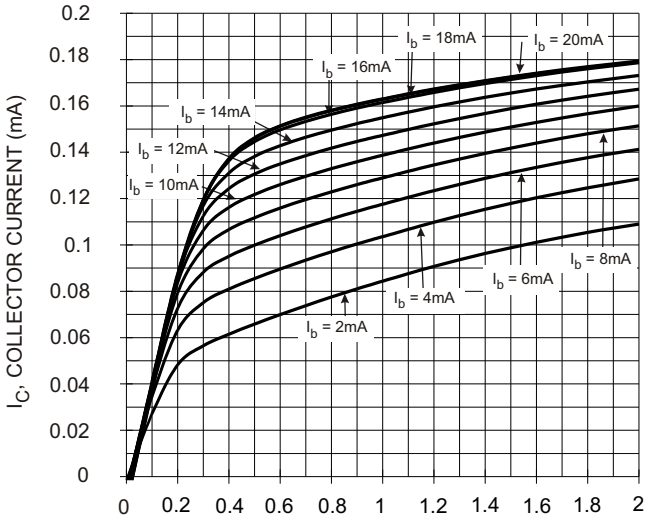

Fig. 4 $V_{CE(SAT)}$ vs. I_C

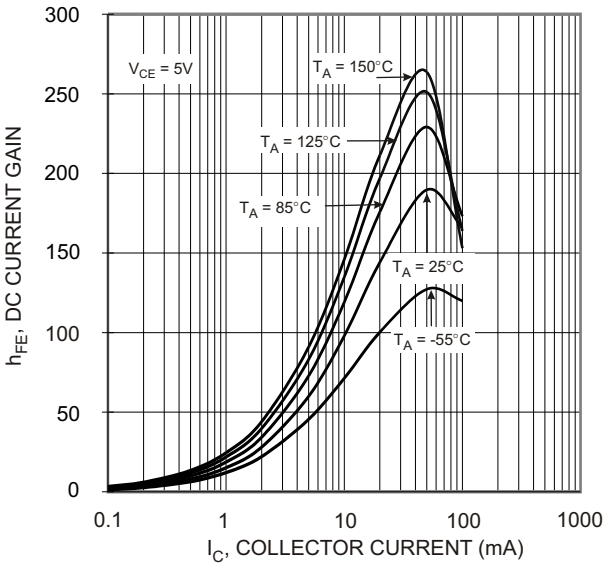

Fig. 5 DC Current Gain

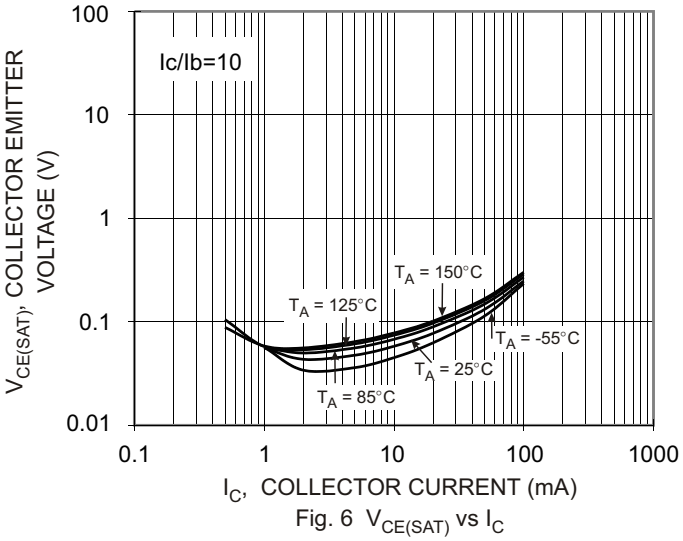

Fig. 6 $V_{CE(SAT)}$ vs I_C

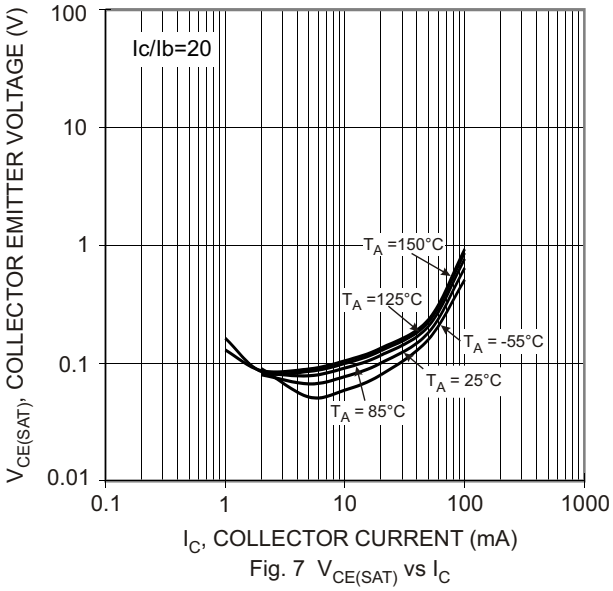

Fig. 7 $V_{CE(SAT)}$ vs I_C

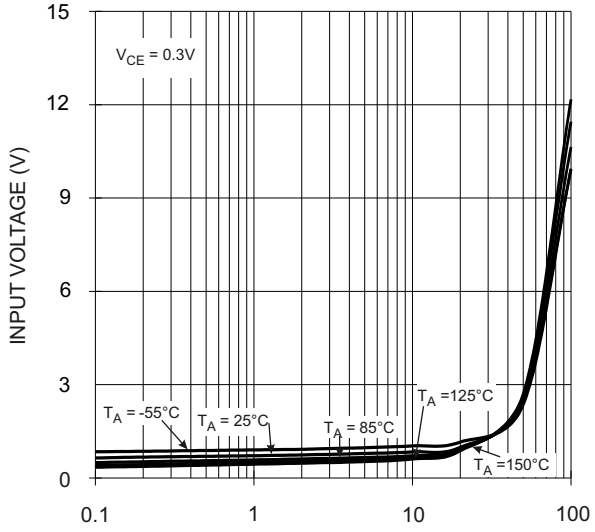

Fig. 8 Input Voltage vs. Output Current

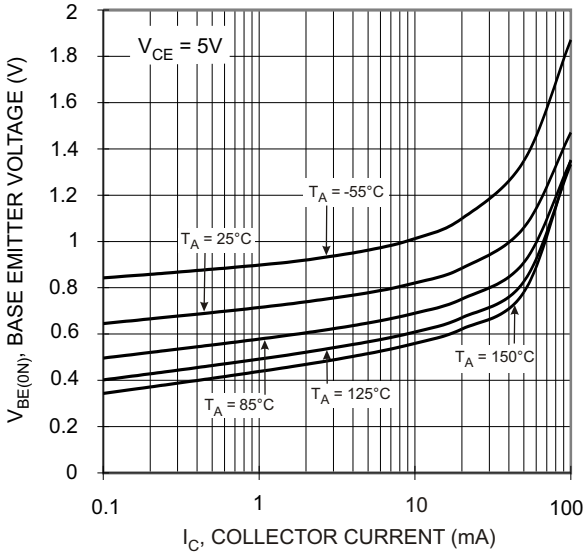

Fig. 9 $V_{BE(ON)}$ vs I_C

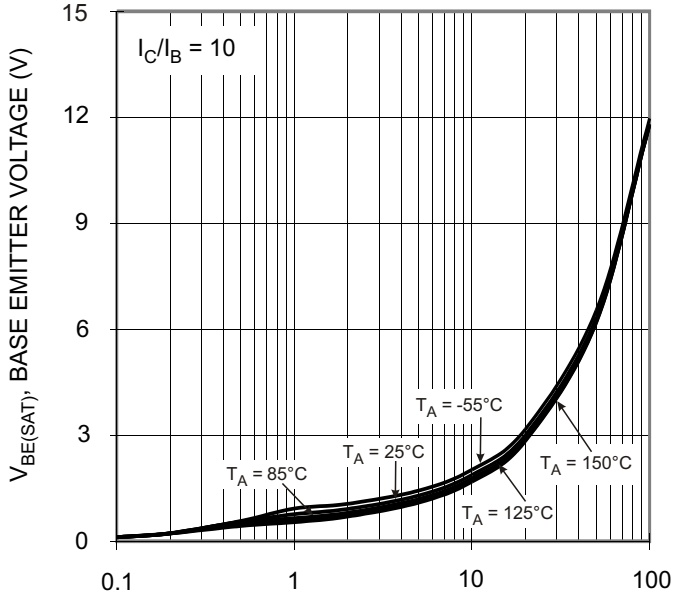

Fig. 10 $V_{BE(SAT)}$ vs I_C

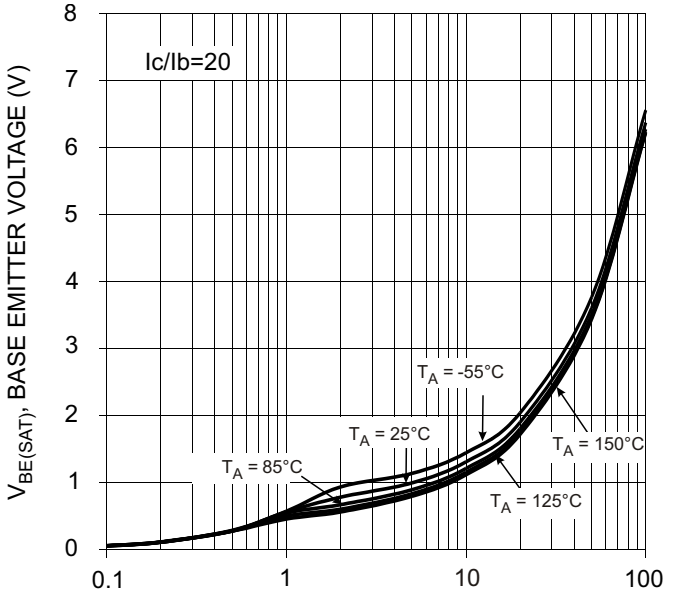

Fig. 11 $V_{BE(SAT)}$ vs I_C

Characteristics Curves of NPN Transistor (Q2)

@ T_{amb} = 25 C unless otherwise specified

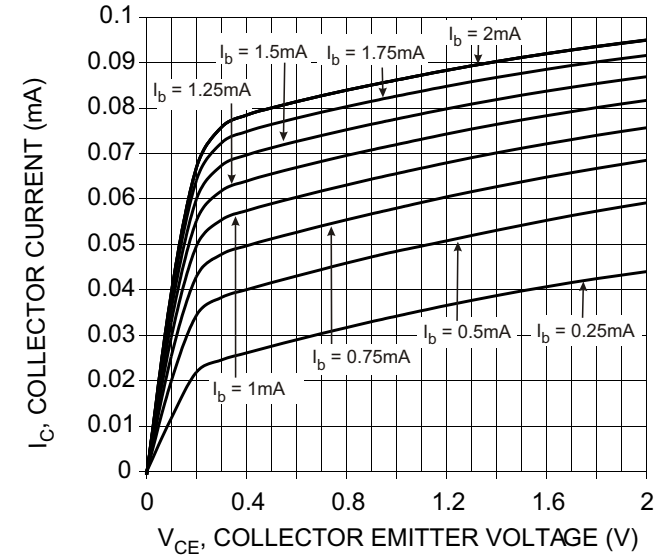

Fig.12 V_{CE} vs I_C

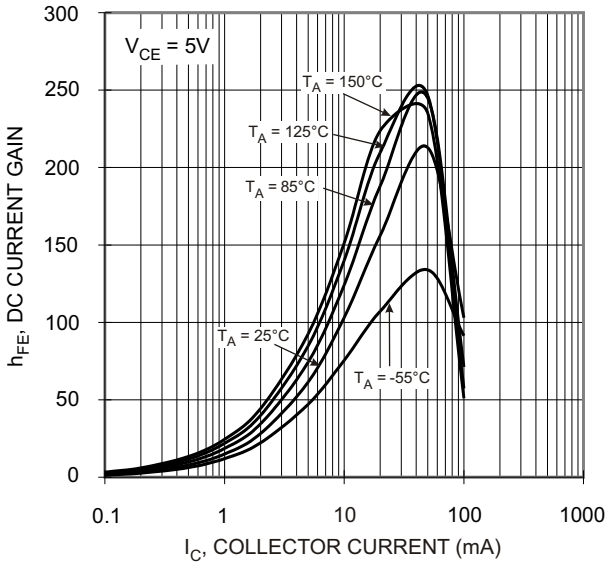

Fig. 13 DC Current Gain

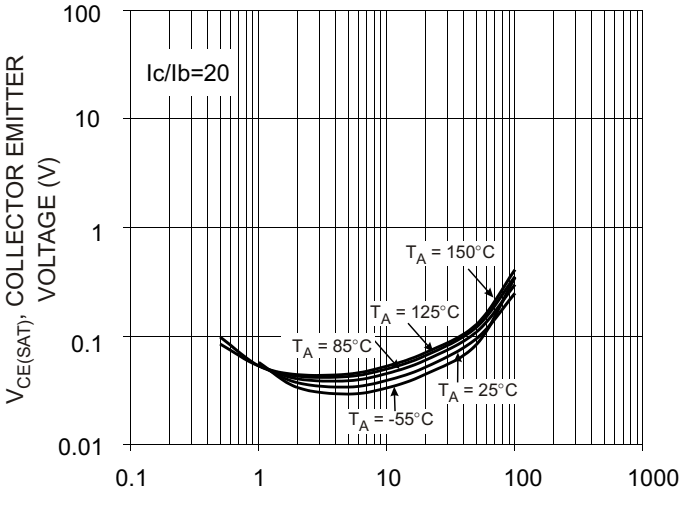

Fig. 14 $V_{CE(SAT)}$ vs I_C

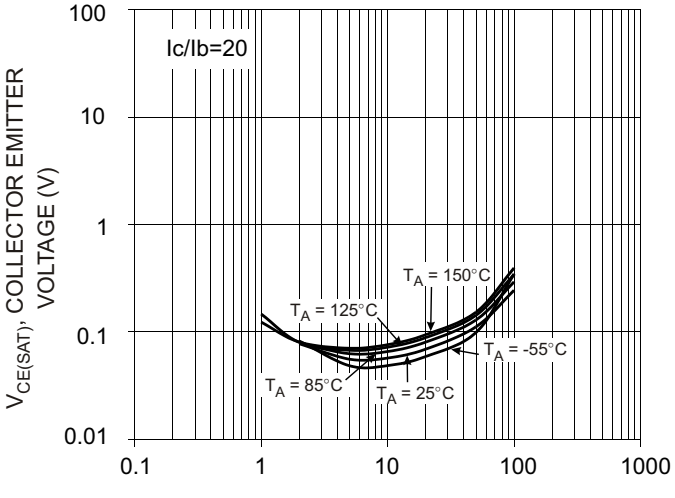

Fig. 15 $V_{CE(SAT)}$ vs I_C

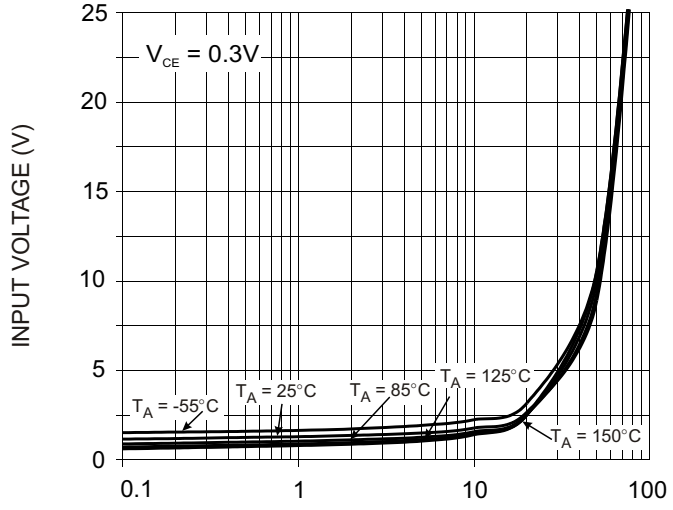

Fig. 16 Input Voltage vs Output Current

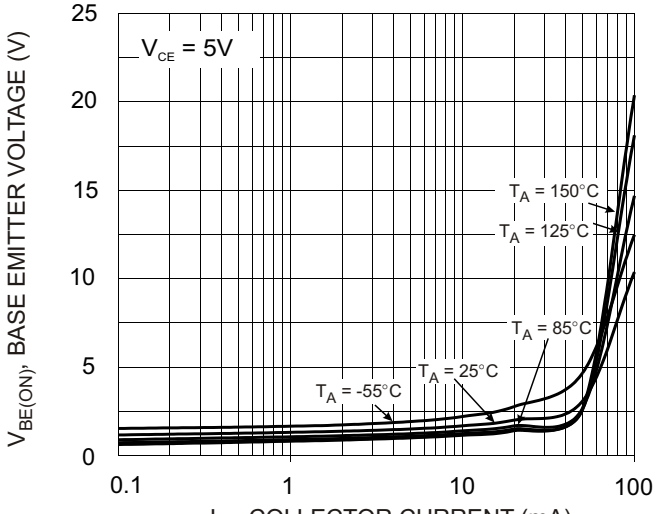

Fig. 17 $V_{BE(ON)}$ vs I_C

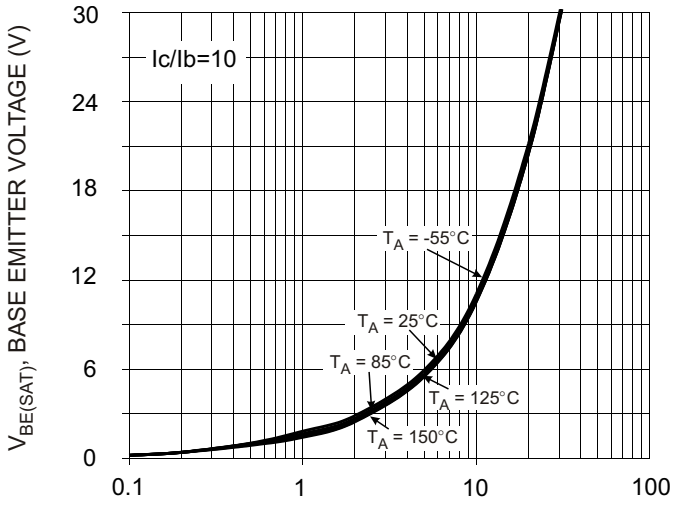

Fig. 18 $V_{BE(ON)}$ vs I_C

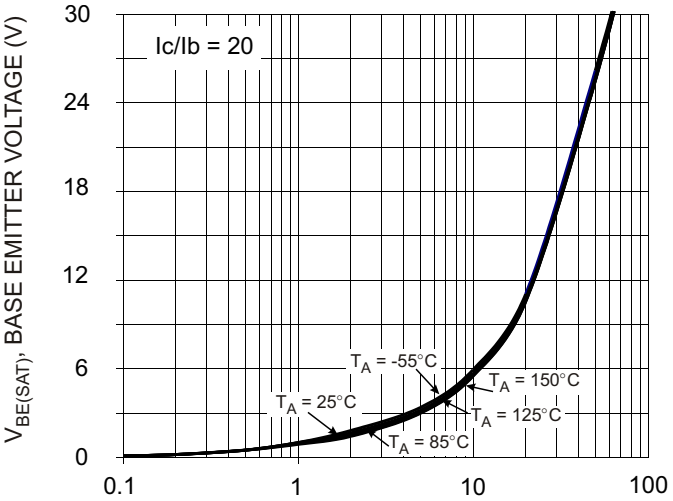

Fig. 19 $V_{BE(SAT)}$ vs I_C

Ordering Information (Note 4)

Device	Marking Code	Packaging	Shipping
DCX100NS-7	C01	SOT-563	3000/Tape & Reel

Notes: 4. For Packaging Details, please see page 6 or go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

Marking Information

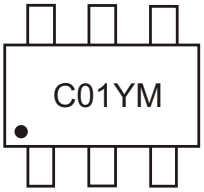

Fig. 20

C01 = Product Type Marking Code
YM = Date Code Marking
Y = Year e.g., T = 2006
M = Month e.g., 9 = September

Date Code Key

Year	2005	2006	2007	2008	2009	2010	2011	2012
Code	S	T	U	V	W	X	Y	Z

Month	Jan	Feb	March	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Mechanical Details

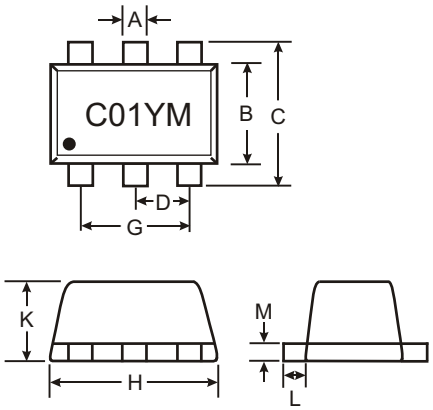

Fig. 21

SOT-563			
Dim	Min	Max	Typ
A	0.15	0.3	0.25
B	1.1	1.25	1.2
C	1.55	1.7	1.6
D		0.5	
G	0.90	1.1	1.00
H	1.5	1.7	1.6
K	0.56	0.6	0.6
L	0.15	0.25	0.2
M	0.1	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout: (Based on IPC-SM-782)

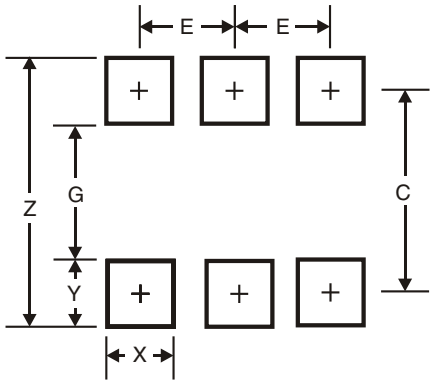

Fig. 22

Figure 22 Dimensions	SOT-563
Z	2.2
G	1.2
X	0.375
Y	0.5
C	1.7
E	0.5

NEW PRODUCT

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