

General Descriptions

- 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 can also be biased using higher supply. The component devices can be used as part of a circuit or as stand alone discrete devices.

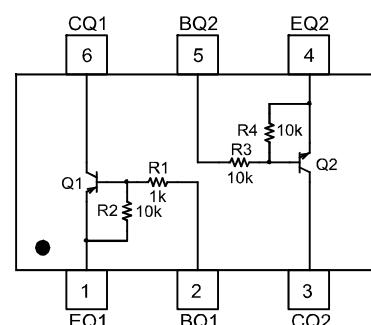


SOT-563

- 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-020
- Terminal Connections: See Diagram
- Terminals: Finish - Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Marking Information: See Page 5
- Ordering Information: See Page 5
- Weight: 0.0035 grams (approximate)



Schematic and Pin Configuration

Reference	Device Type	R1 (NOM)	R2 (NOM)	R3, R4 (NOM)
Q1	PNP	1K Ω	10K Ω	—
Q2	NPN	—	—	10K Ω

Maximum Ratings: Total Device

@ $T_A = 25^\circ\text{C}$ unless otherwise specified

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

Sub-Component Device - Pre-Biased PNP Transistor

@ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	-50	V
Input Voltage	V_{IN}	+5 to -10	V
Output Current	I_{O}	-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

$\text{@T}_A = 25^\circ\text{C}$ unless otherwise specified

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

Electrical Characteristics: Pre-Biased PNP Transistor

$\text{@T}_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(off)}$	-0.3	—	—	V	$V_{CC} = -5\text{V}$, $I_o = -100\text{uA}$
	$V_{I(on)}$	—	—	-3.0	V	$V_O = -0.3\text{V}$, $I_o = -20\text{mA}$
Output Voltage	$V_{O(on)}$	—	0.1	-0.3	V	$I_o/I_I = -10\text{mA} / -0.5\text{mA}$
Input Current	I_I	—	—	-7.2	mA	$V_I = -5\text{V}$
Output Current	$I_O(off)$	—	—	-0.5	uA	$V_{CC} = -50\text{V}$, $V_I = 0\text{V}$
DC Current Gain	G_I	33	—	—	—	$V_O = -5\text{V}$, $I_o = -5\text{mA}$
Input Resistor Tolerance	ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance	R_2/R_1	0.8	1	1.2	%	—
Gain-Bandwidth Product	f_T	—	250	—	MHz	$V_{CE} = -10\text{V}$, $I_E = -5\text{mA}$, $f = 100\text{ MHz}$

Electrical Characteristics: Pre-Biased NPN Transistor

$\text{@T}_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(off)}$	0.5	1.18	—	V	$V_{CC} = 5\text{V}$, $I_o = 100\text{uA}$
	$V_{I(on)}$	—	1.85	3	V	$V_O = 0.3\text{V}$, $I_o = 10\text{mA}$
Output Voltage	$V_{O(on)}$	—	0.1	0.3	V	$I_o/I_I = 10\text{mA} / 0.5\text{mA}$
Input Current	I_I	—	—	0.88	mA	$V_I = 5\text{V}$
Output Current	$I_O(off)$	—	—	0.5	uA	$V_{CC} = 50\text{V}$, $V_I = 0\text{V}$
DC Current Gain	G_I	30	—	—	—	$V_O = 5\text{V}$, $I_o = 5\text{mA}$
Input Resistor Tolerance	ΔR_1	-30	—	+30	%	—
Resistor Ratio Tolerance	R_2/R_1	0.8	1	1.2	—	—
Gain-Bandwidth Product	f_T	—	250	—	MHz	$V_{CE} = 10\text{V}$, $I_E = 5\text{mA}$, $f = 100\text{ MHz}$

Typical Characteristics

$\text{@T}_A = 25^\circ\text{C}$ unless otherwise specified

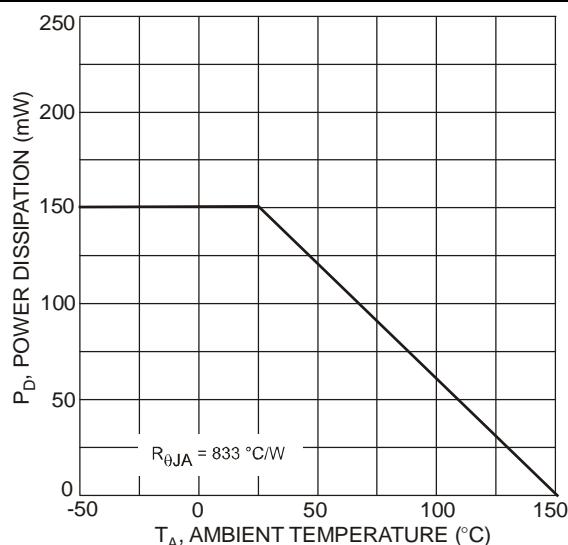


Fig. 1 Power Derating Curve (Total Device)

Characteristics Curves of PNP Transistor (Q1)

@ $T_A = 25^\circ\text{C}$ unless otherwise specified

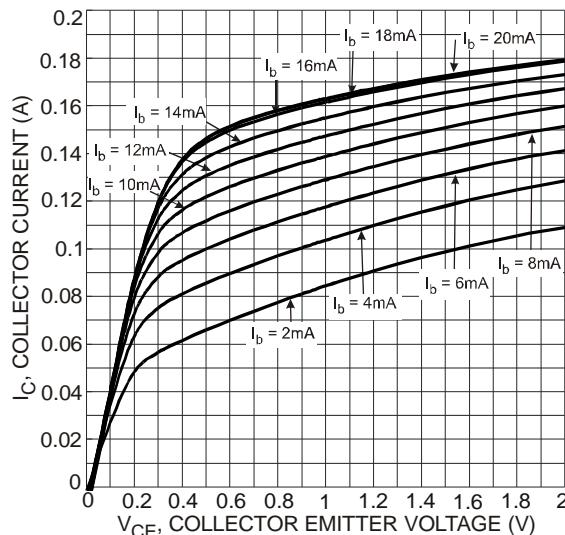


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

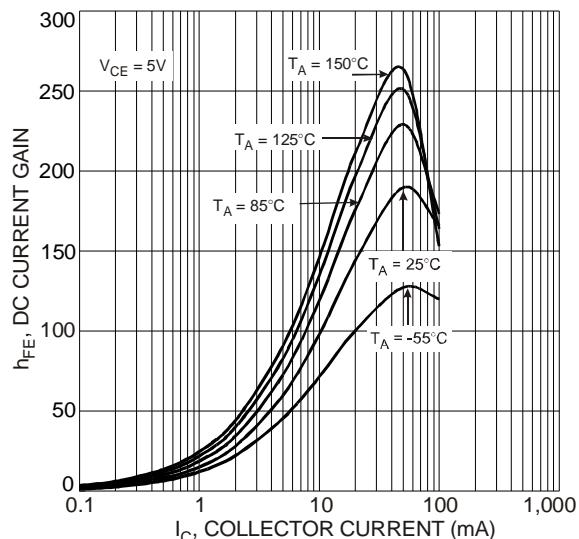


Fig. 3 Typical DC Current Gain vs. Collector Current

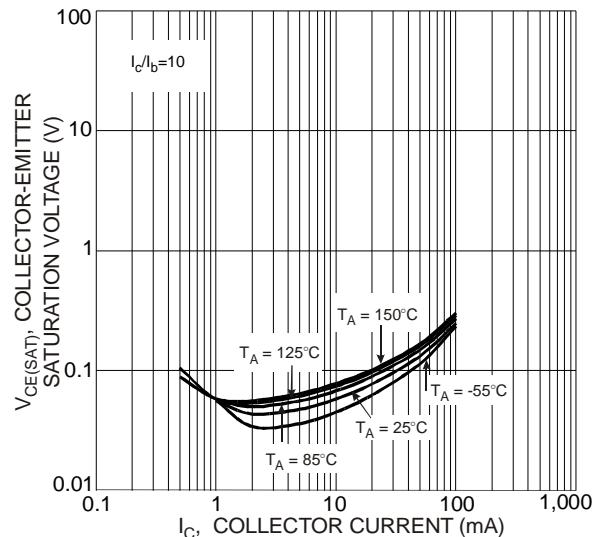


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

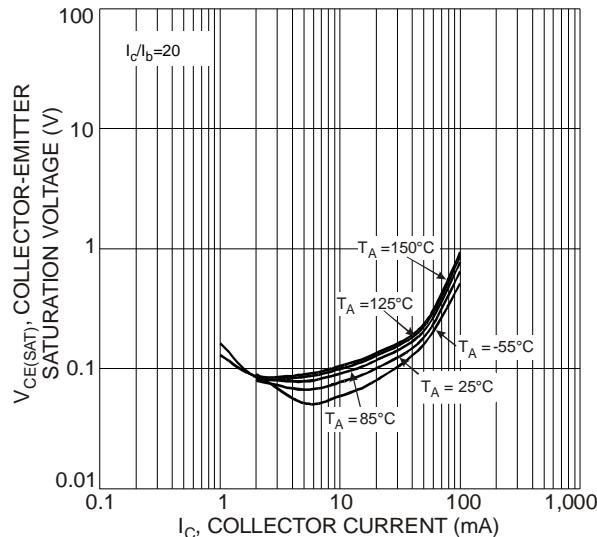


Fig. 5 Typical Collector-Emitter Saturation Voltage vs. Collector Current

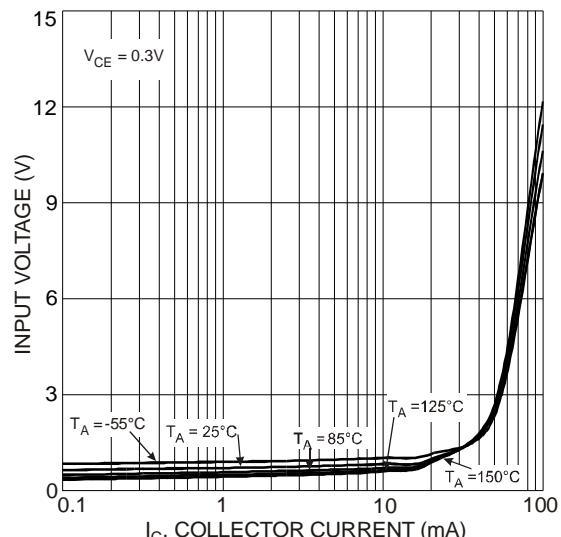


Fig. 6 Typical Input Voltage vs. Collector Current

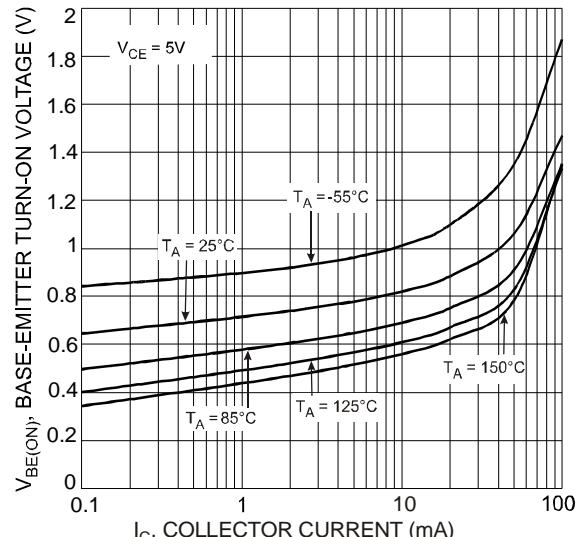


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

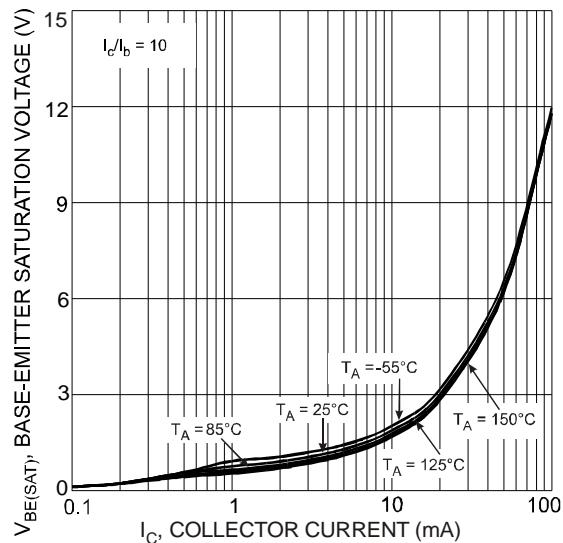


Fig. 8 Typical Base-Emitter Saturation Voltage vs. Collector Current

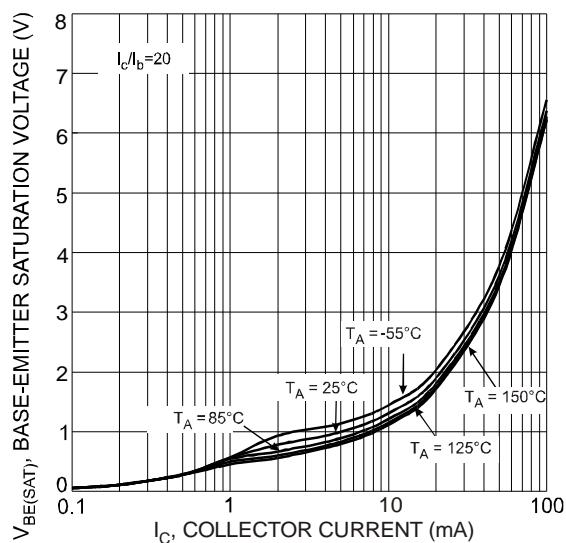


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

Characteristics Curves of NPN Transistor (Q2)

$\text{AT}_A = 25^\circ\text{C}$ unless otherwise specified

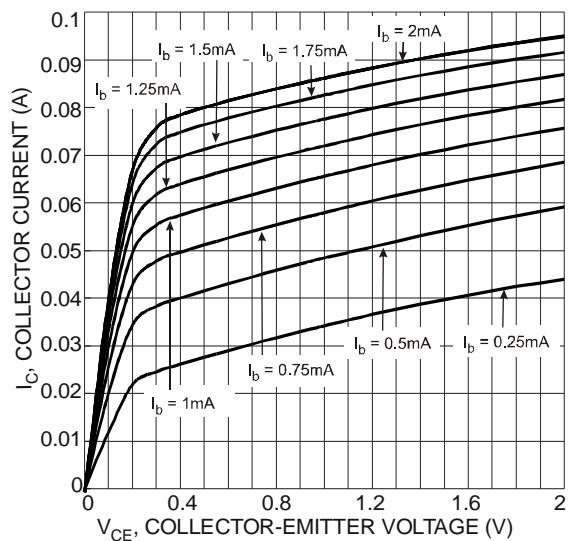


Fig. 10 Typical Collector Current vs. Collector-Emitter Voltage

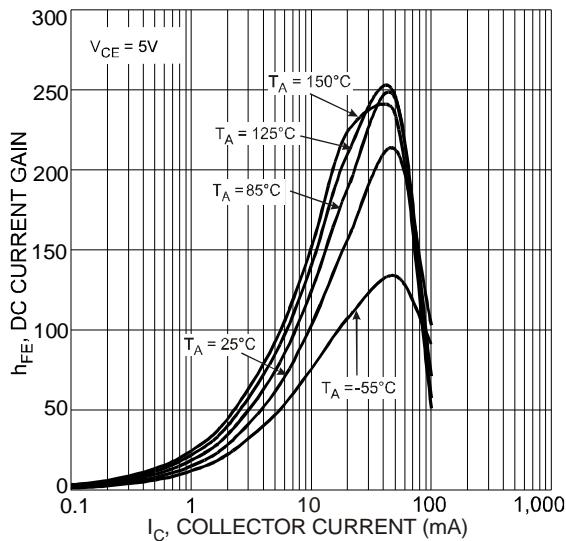


Fig. 11 Typical DC Current Gain vs. Collector Current

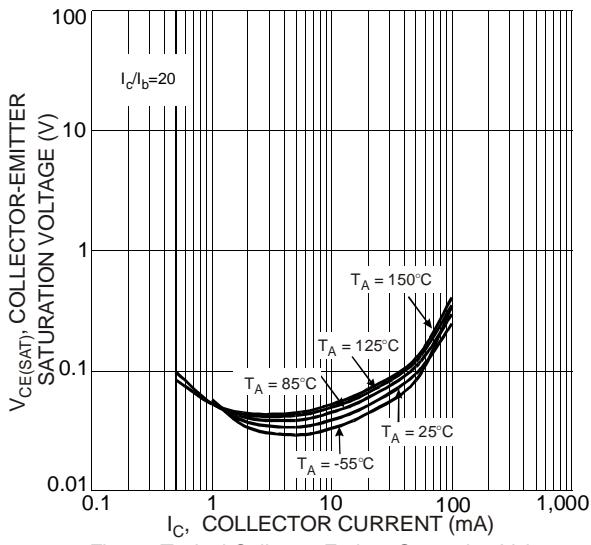


Fig. 12 Typical Collector-Emitter Saturation Voltage vs. Collector Current

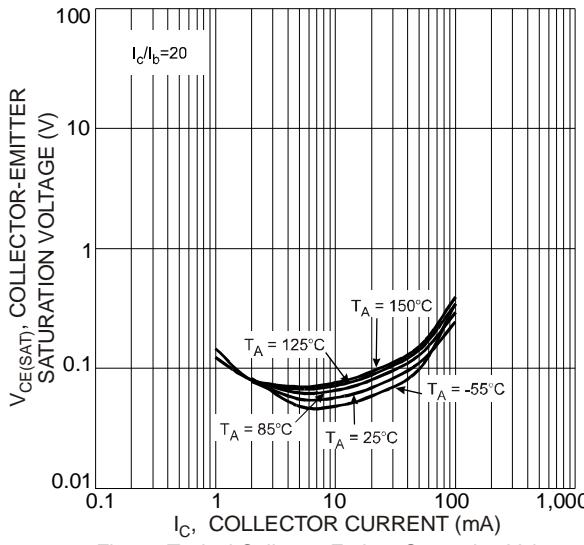
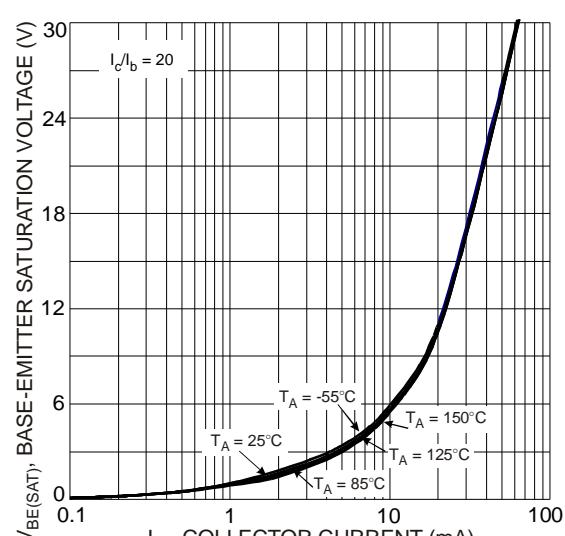
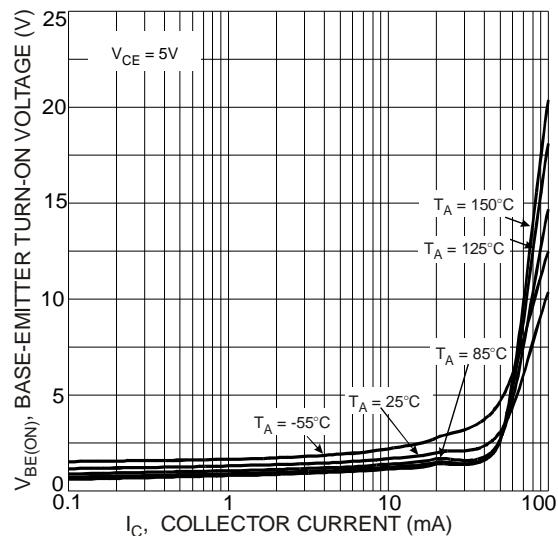
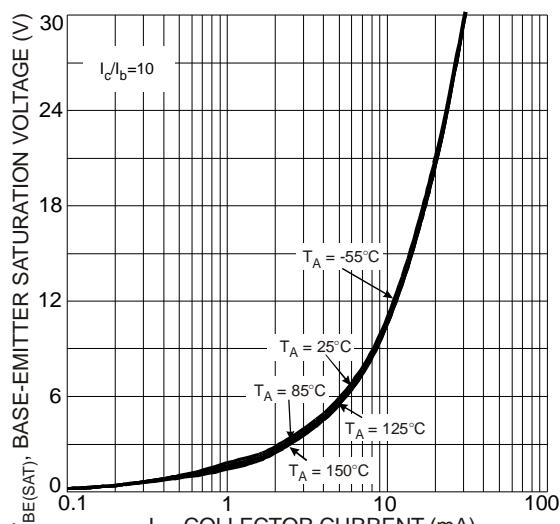
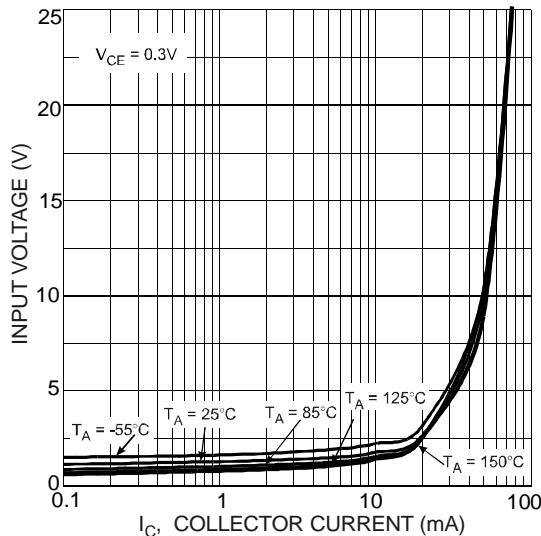


Fig. 13 Typical Collector-Emitter Saturation Voltage vs. Collector Current

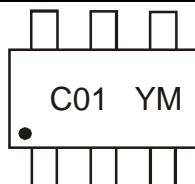


Ordering Information (Note 4)

Device	Packaging	Shipping
DCX100NS-7	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

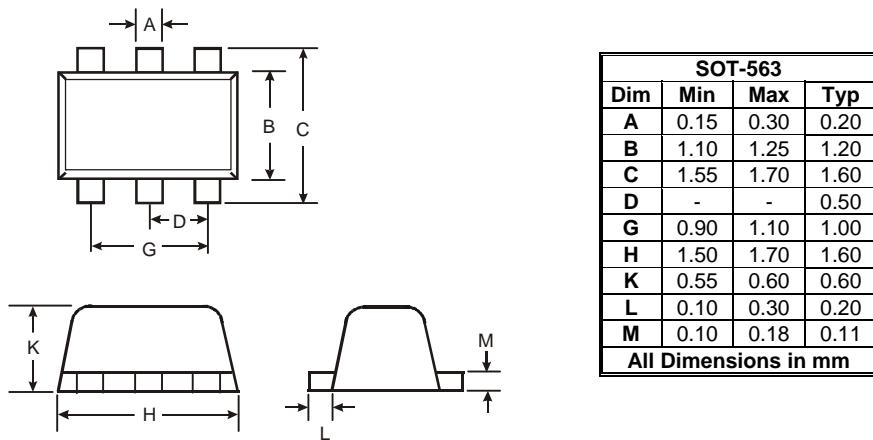


C01 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year e.g., T = 2006
 M = Month e.g., 9 = September

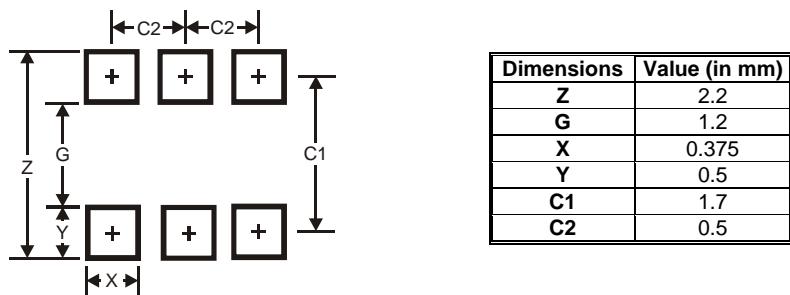
Date Code Key

Year	2005	2006	2007	2008	2009	2010	2011	2012				
Code	S	T	U	V	W	X	Y	Z				
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Package Outline Dimensions



Suggested Pad Layout



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