General Descriptions

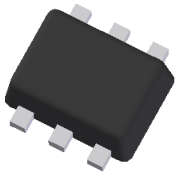
- DCX100NS is best suited for applications where the load needs to be turned on and off using control circuits like micro-controllers, comparators etc. particularly at a point of load. It features a discrete PNP pass transistor which can support continuous maximum current up to 100 mA. It also contains 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.

Features

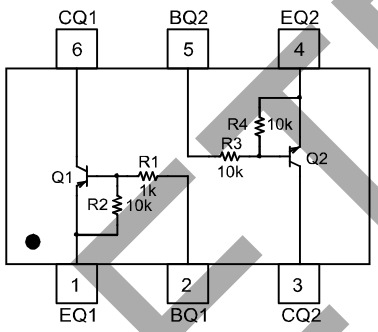
- Built in Biasing Resistors
- Epitaxial Planar Die Construction
- **Lead Free By Design/ROHS Compliant (Note 1)**
- **"Green" Device (Note 2)**
- **Ideally Suited for Automated Assembly Processes**

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-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)



SOT-563



Schematic and Pin Configuration

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

Maximum Ratings: Total Device

@T_A = 25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Power Dissipation	(Note 3)	P_D	150	mW
Collector Current (using PNP as Pass Transistor)		$I_{C(max)}$	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°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_O	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	Δ R1	-30	—	+30	%	—
Resistance 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	ΔR1	-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_A = 25°C unless otherwise specified

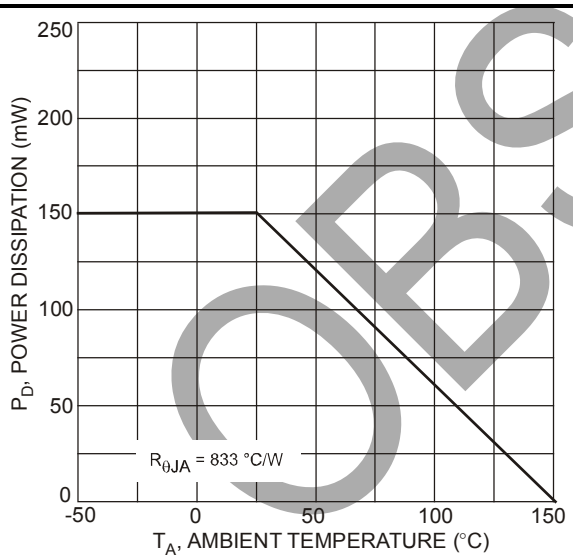


Fig. 1 Power Derating Curve (Total Device)

Characteristics Curves of PNP Transistor (Q1)

@T_A = 25°C unless otherwise specified

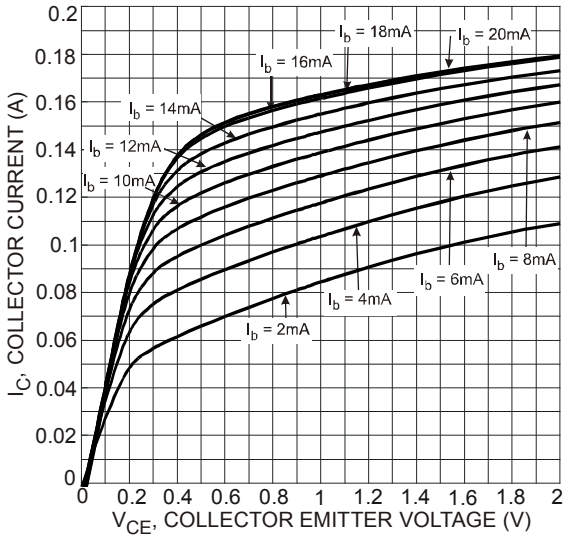


Fig. 2 Typical Collector Current vs. Collector-Emitter Voltage

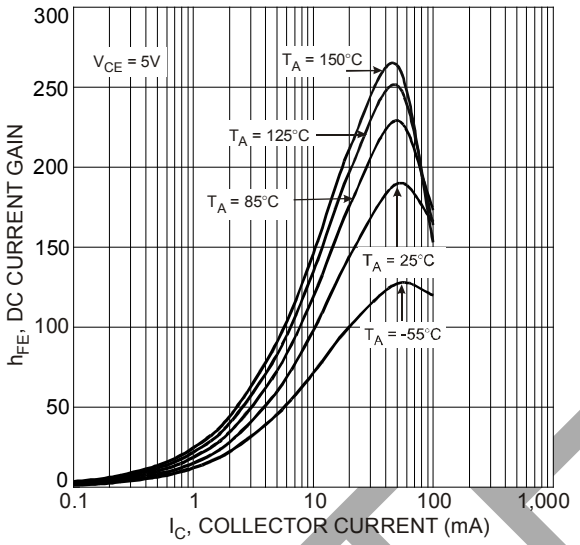


Fig. 3 Typical DC Current Gain vs. Collector Current

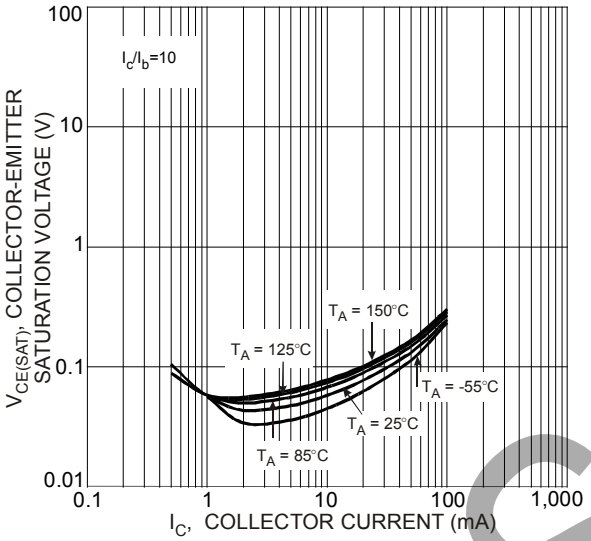


Fig. 4 Typical Collector-Emitter Saturation Voltage vs. Collector Current

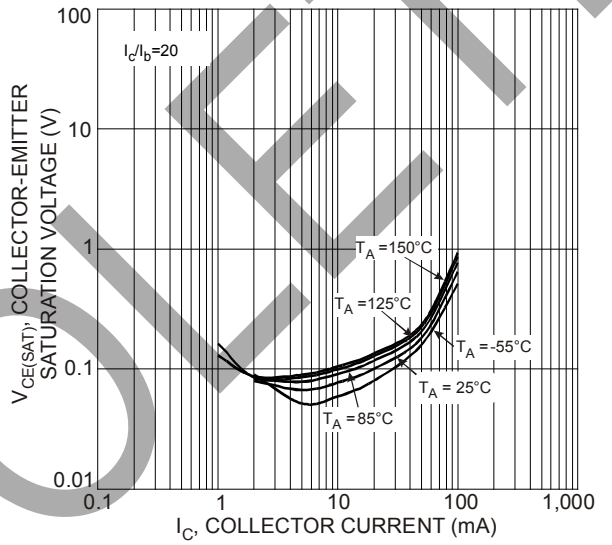


Fig. 5 Typical Collector-Emitter Saturation Voltage vs. Collector Current

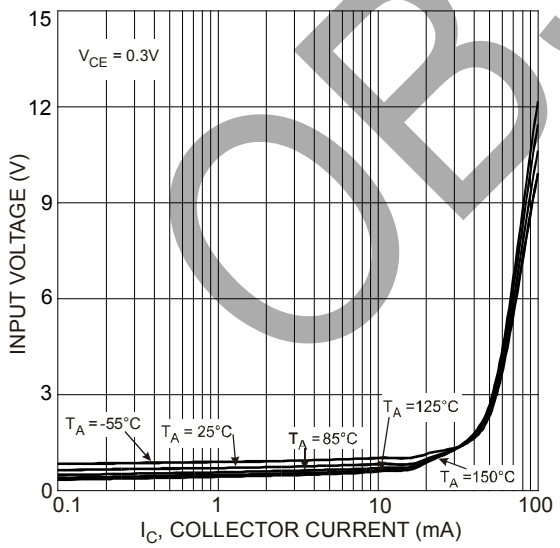


Fig. 6 Typical Input Voltage vs. Collector Current

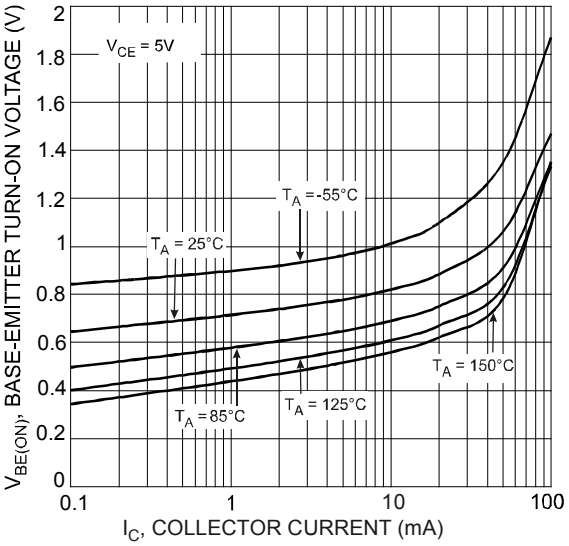


Fig. 7 Typical Base-Emitter Turn-On Voltage vs. Collector Current

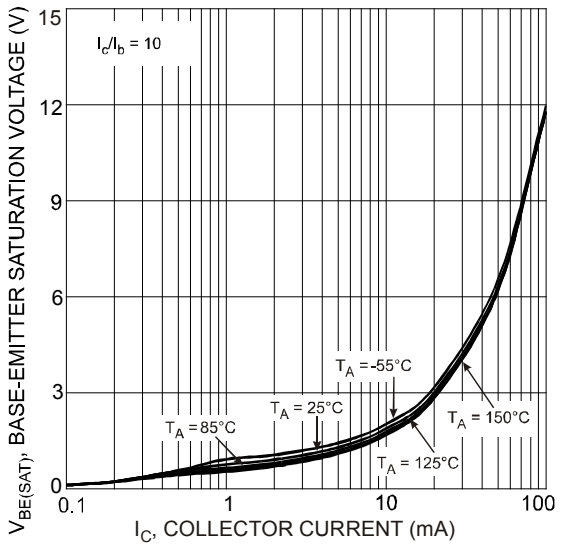


Fig. 8 Typical Base-Emitter Saturation Voltage vs. Collector Current

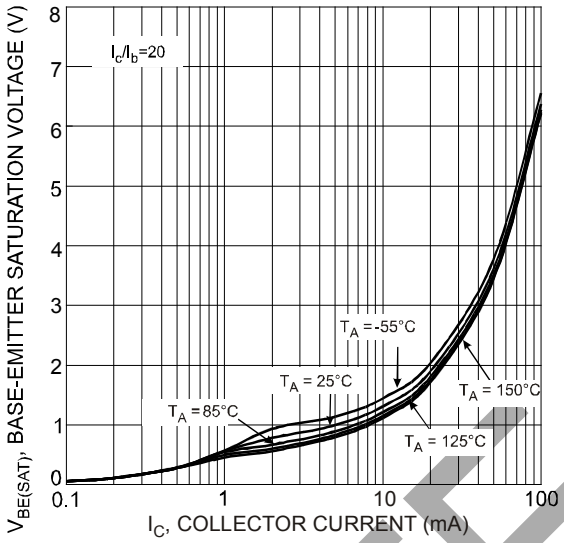


Fig. 9 Typical Base-Emitter Saturation Voltage vs. Collector Current

Characteristics Curves of NPN Transistor (Q2)

@T_A = 25°C unless otherwise specified

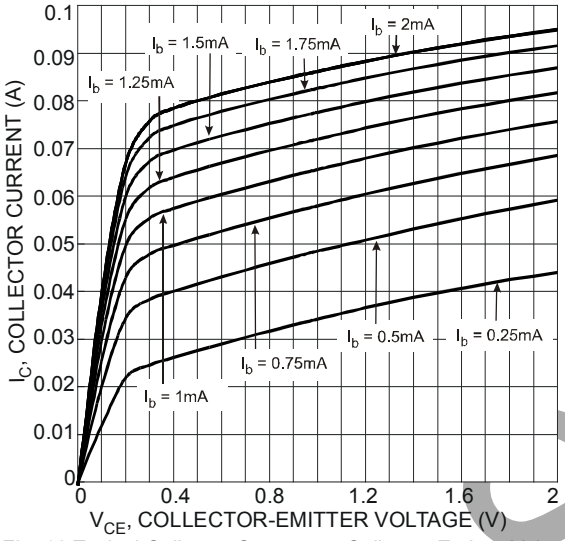


Fig. 10 Typical Collector Current vs. Collector-Emitter Voltage

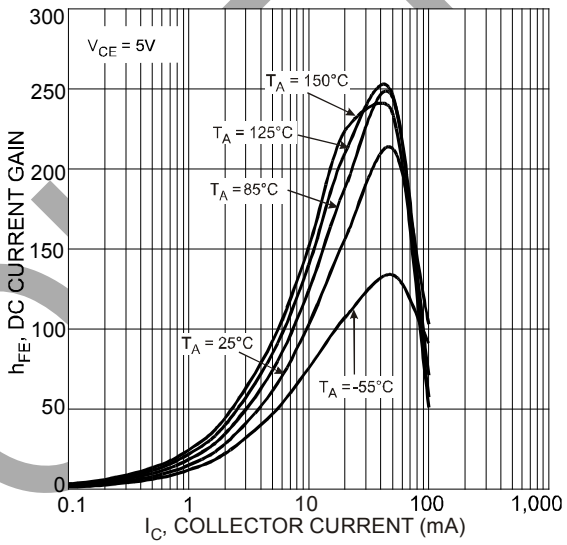


Fig. 11 Typical DC Current Gain vs. Collector Current

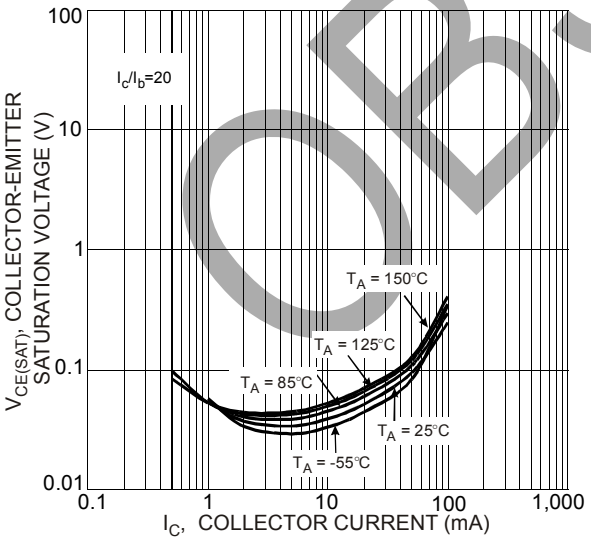


Fig. 12 Typical Collector-Emitter Saturation Voltage vs. Collector Current

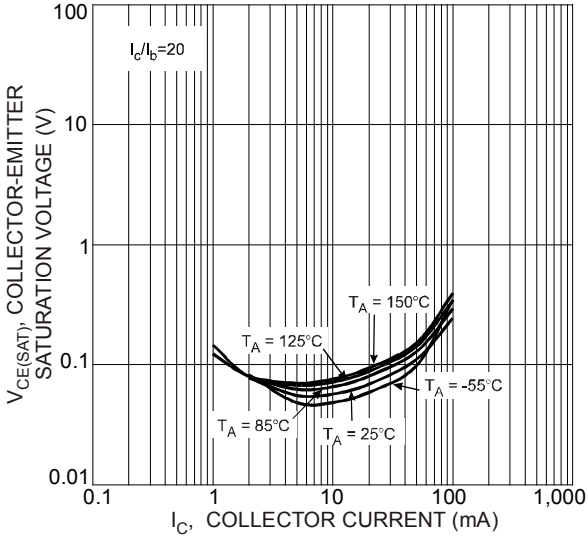


Fig. 13 Typical Collector-Emitter Saturation Voltage vs. Collector Current

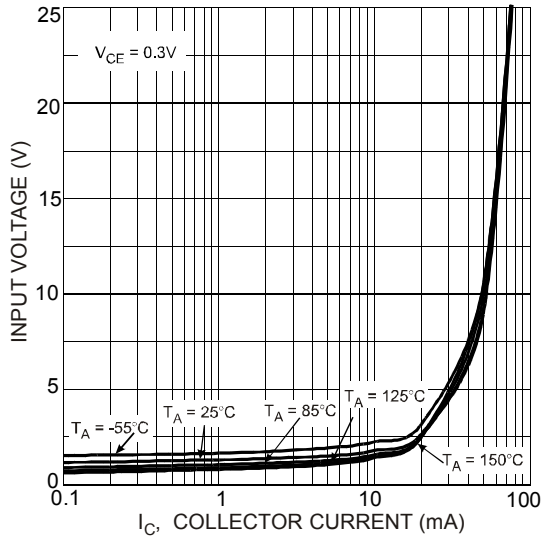


Fig. 14 Typical Input voltage vs. Output Current

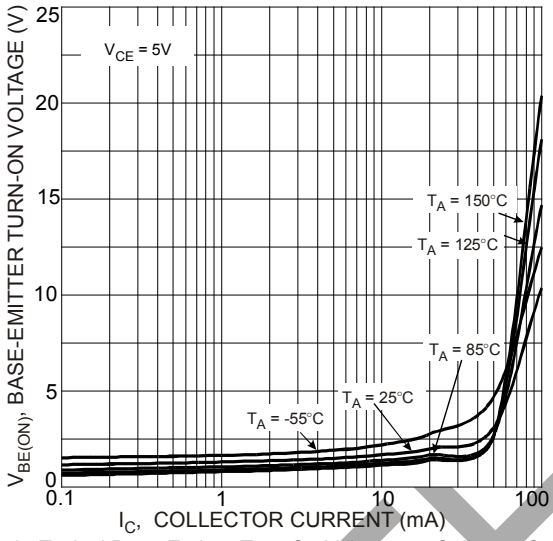


Fig. 15 Typical Base-Emitter Turn-On Voltage vs. Collector Current

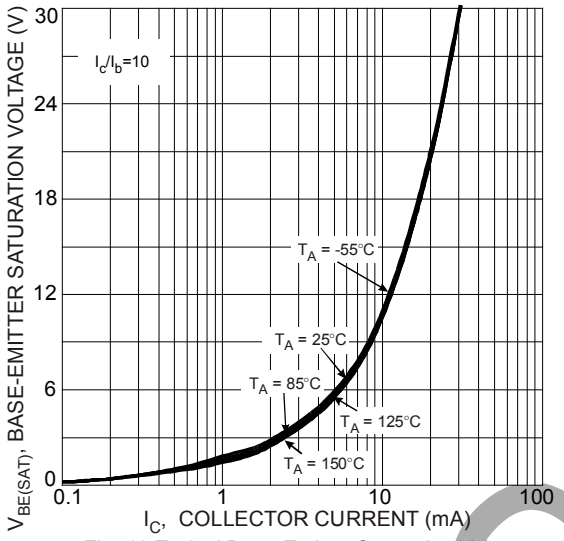


Fig. 16 Typical Base-Emitter Saturation Voltage vs. Collector Current

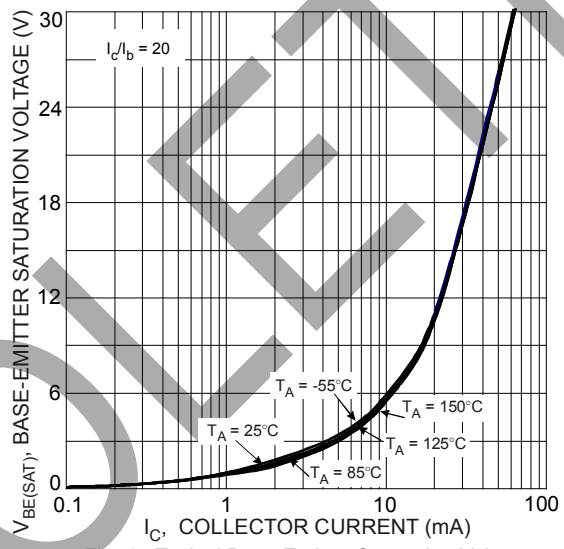


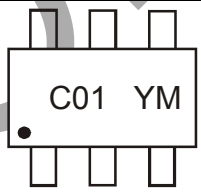
Fig. 17 Typical Base-Emitter Saturation Voltage vs. Collector Current

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



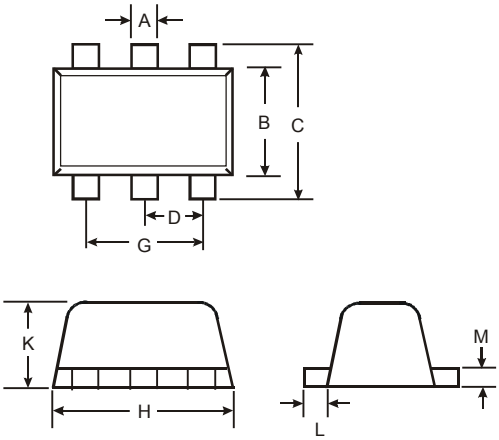
C01 = Product Type Marking Code
YM = Date Code Marking
Y = Year e.g., T = 2006
M = Month e.g., 9 = September

Date Code Key

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

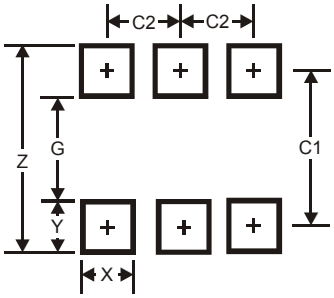
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

Package Outline Dimensions



SOT-563			
Dim	Min	Max	Typ
A	0.15	0.30	0.20
B	1.10	1.25	1.20
C	1.55	1.70	1.60
D	-	-	0.50
G	0.90	1.10	1.00
H	1.50	1.70	1.60
K	0.55	0.60	0.60
L	0.10	0.30	0.20
M	0.10	0.18	0.11
All Dimensions in mm			

Suggested Pad Layout



Dimensions	Value (in mm)
Z	2.2
G	1.2
X	0.375
Y	0.5
C1	1.7
C2	0.5

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