COMPLEMENTARY NPN/PNP PRE-BIASED SMALL SIGNAL DUAL SURFACE MOUNT TRANSISTOR

Features

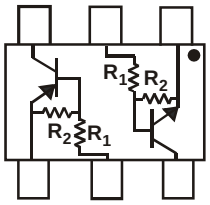
- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

P/N	R1 (NOM)	R2 (NOM)	MARKING
DCX122LH	0.22KΩ	10KΩ	C81
DCX142JH	0.47KΩ	10KΩ	C82
DCX122TH	0.22KΩ	OPEN	C83
DCX142TH	0.47KΩ	OPEN	C84

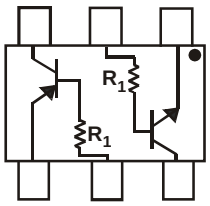
Mechanical Data

- Case: SOT-563
- Case Material: Molded Plastic; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe; Solderable per MIL-STD-202, Method 208 e3
- Terminal Connections: See Diagram
- Weight: 0.005 grams (Approximate)

SOT-563



R_1, R_2



R_1 Only

SCHEMATIC DIAGRAM, TOP VIEW

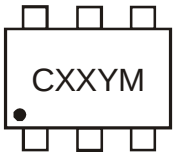
Ordering Information (Note 4)

Device	Packaging	Shipping
DCX122LH-7	SOT-563	3,000/Tape & Reel
DCX142JH-7	SOT-563	3,000/Tape & Reel
DCX122TH-7	SOT-563	3,000/Tape & Reel
DCX142TH-7	SOT-563	3,000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
4. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

SOT-563



CXX = Product Type Marking Code
YM = Date Code Marking
Y = Year ex: T = 2006
M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Code	N	P	R	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

Maximum Ratings NPN Section (@T_A = +25°C unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Supply Voltage		V_{CC}	50	V
Input Voltage	DCX122LH DCX142JH	V_{IN}	-5 to +6 -5 to +6	V
Input Voltage	DCX122TH DCX142TH	$V_{EBO\ (MAX)}$	5	V
Output Current	All	I_C	100	mA
Power Dissipation	(Notes 5 & 6)	P_d	150	mW
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range		T_j, T_{STG}	-55 to +150	°C

Maximum Ratings PNP Section (@T_A = +25°C unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Supply Voltage		V_{CC}	-50	V
Input Voltage	DCX122LH DCX142JH	V_{IN}	+5 to -6 +5 to -6	V
Input Voltage	DCX122TH DCX142TH	$V_{EBO\ (MAX)}$	-5	V
Output Current	All	I_C	-100	mA
Power Dissipation	(Notes 5 & 6)	P_d	150	mW
Thermal Resistance, Junction to Ambient Air	(Note 5)	$R_{\theta JA}$	833	°C/W
Operating and Storage Temperature Range		T_j, T_{STG}	-55 to +150	°C

Notes:
5. Mounted on FR4 PC Board with recommended pad layout at http://www.diodes.com/datasheets/ap02001.pdf.
6. NPN Section, PNP Section, or maximum combined.

Electrical Characteristics NPN Section, R1, R2 Types (@T_A = +25°C unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DCX122LH DCX142JH	$V_{I(off)}$	0.3 0.3	—	—	V	V_{CC} = 5V, I_O = 100µA
	DCX122LH DCX142JH	$V_{I(on)}$	—	—	2.0 2.0	V	V_O = 0.3V, I_O = 20mA V_O = 0.3V, I_O = 20mA
Output Voltage		$V_{O(on)}$	—	—	0.3V	V	I_O/I_I = 5mA/0.25mA
Input Current	DCX122LH DCX142JH	I_I	—	—	28 13	mA	V_I = 5V
Output Current		$I_{O(off)}$	—	—	0.5	µA	V_{CC} = 50V, V_I = 0V
DC Current Gain	DDCX122LH DDCX142JH	G_I	56 56	—	—	—	V_O = 5V, I_O = 10mA
Gain-Bandwidth Product*		f_T	—	200	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

* Transistor - For Reference Only

Electrical Characteristics NPN Section, R1-Only (@T_A = +25°C unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	50	—	—	V	I_C = 50µA
Collector-Emitter Breakdown Voltage		BV_{CEO}	40	—	—	V	I_C = 1mA
Emitter-Base Breakdown Voltage	DCX122TH DCX142TH	BV_{EBO}	5	—	—	V	I_E = 50µA I_E = 50µA
Collector Cut-Off Current		I_{CBO}	—	—	0.5	µA	V_{CB} = 50V
Emitter Cut-Off Current	DCX122TH DCX142TH	I_{EBO}	— —	—	0.5 0.5	µA	V_{EB} = 4V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	0.3	V	I_C = 5mA, I_B = 0.25mA
DC Current Transfer Ratio	DCX122TH DCX142TH	h_{FE}	100 100	250 250	600 600	—	I_C = 1mA, V_{CE} = 5V
Gain-Bandwidth Product*		f_T	—	200	—	MHz	V_{CE} = 10V, I_E = -5mA, f = 100MHz

* Transistor - For Reference Only

Electrical Characteristics PNP Section, R1, R2 Types (@T_A = +25°C unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DCX122LH DCX142JH	$V_{I(off)}$	-0.3 -0.3	—	—	V	V_{CC} = -5V, I_O = -100µA
	DCX122LH DCX142JH	$V_{I(on)}$	—	—	-2.0 -2.0	V	V_O = -0.3V, I_O = -20mA V_O = -0.3V, I_O = -20mA
Output Voltage		$V_{O(on)}$	—	—	-0.3V	V	I_O/I_I = -5mA/-0.25mA
Input Current	DCX122LH DCX142JH	I_I	—	—	-28 -13	mA	V_I = -5V
Output Current		$I_{O(off)}$	—	—	-0.5	µA	V_{CC} = -50V, V_I = 0V
DC Current Gain	DCX122LH DCX142JH	G_I	56 56	—	—	—	V_O = -5V, I_O = -10mA
Gain-Bandwidth Product*		f_T	—	200	—	MHz	V_{CE} = -10V, I_E = -5mA, f = 100MHz

* Transistor - For Reference Only

Electrical Characteristics, R1-Only Types @T_A = 25°C unless otherwise specified

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage		BV_{CBO}	-50	—	—	V	I_C = -50µA
Collector-Emitter Breakdown Voltage		BV_{CEO}	-40	—	—	V	I_C = -1mA
Emitter-Base Breakdown Voltage	DCX122TH DCX142TH	BV_{EBO}	-5	—	—	V	I_E = -50µA I_E = -50µA
Collector Cut-Off Current		I_{CBO}	—	—	-0.5	µA	V_{CB} = -50V
Emitter Cut-Off Current	DCX122TH DCX142TH	I_{EBO}	— —	—	-0.5 -0.5	µA	V_{EB} = -4V
Collector-Emitter Saturation Voltage		$V_{CE(sat)}$	—	—	-0.3	V	I_C = -5mA, I_B = -0.25mA
DC Current Transfer Ratio	DCX122TH DCX142TH	h_{FE}	100 100	250 250	600 600	—	I_C = -1mA, V_{CE} = -5V
Gain-Bandwidth Product*		f_T	—	200	—	MHz	V_{CE} = -10V, I_E = 5mA, f = 100MHz

* Transistor - For Reference Only

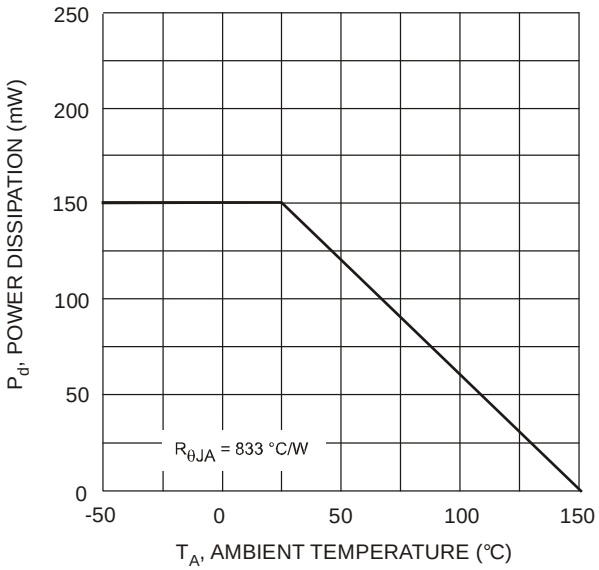
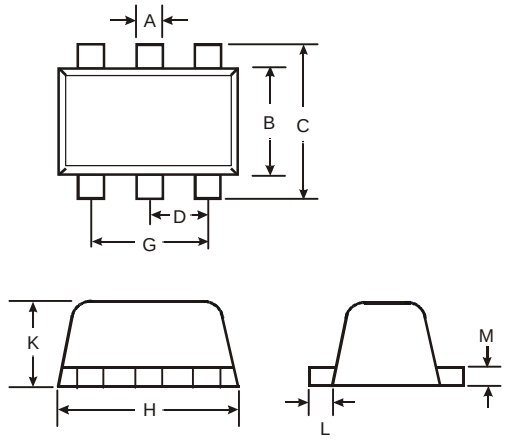


Fig. 1 Derating Curve - Total

Package Outline Dimensions

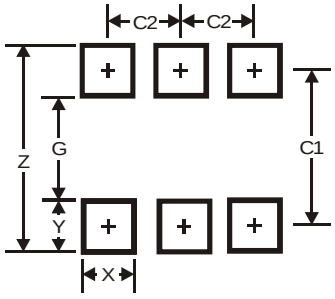
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



SOT563			
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

Please see AP02001 at http://www.diodes.com/datasheets/ap02001.pdf for the latest version.



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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