

COMPLEMENTARY NPN/PNP PRE-BIASED SMALL SIGNAL SOT-363 DUAL SURFACE MOUNT TRANSISTOR

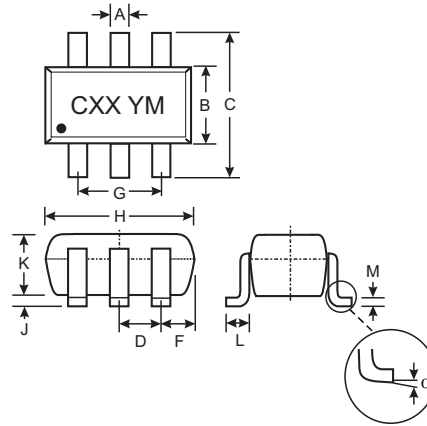
NEW PRODUCT

Features

- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Lead Free/RoHS Compliant (Note 3)

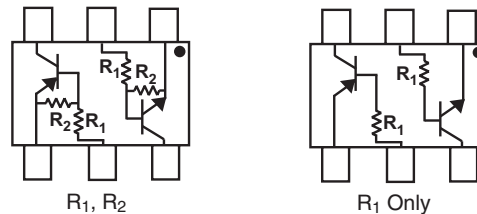
Mechanical Data

- Case: SOT-363
- Case Material: Molded Plastic. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020C
- Terminals: Finish - Matte Tin Solderable per MIL-STD-202, Method 208
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe).
- Terminal Connections: See Diagram
- Marking: Date Code and Type Code, See Page 3
- Type Code: See Table Below
- Ordering Information (See Page 3)
- Weight: 0.006 grams (approx.)



SOT-363		
Dim	Min	Max
A	0.10	0.30
B	1.15	1.35
C	2.00	2.20
D	0.65 Nominal	
F	0.30	0.40
H	1.80	2.20
J	—	0.10
K	0.90	1.00
L	0.25	0.40
M	0.10	0.25
α	0°	8°
All Dimensions in mm		

P/N	R1 (NOM)	R2 (NOM)	Type Code
DCX122LU	0.22K	10K	C81
DCX142JU	0.47K	10K	C82
DCX122TU	0.22K	OPEN	C83
DCX142TU	0.47K	OPEN	C84



SCHEMATIC DIAGRAM

Maximum Ratings NPN Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	50	V
Input Voltage	V_{IN}	-5 to +6	V
Input Voltage	$V_{EBO (MAX)}$	5	V
Output Current	I_C	100	mA
Power Dissipation (Note 1, 2)	P_d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 2)	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	$^\circ\text{C}$

- Note: 1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
 2. 150mW per element must not be exceeded.
 3. No purposefully added lead.

Maximum Ratings PNP Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	-50	V
Input Voltage	DCX122LU DCX142JU V_{IN}	+5 to -6 +5 to -6	V
Input Voltage	DCX122TU DCX142TU $V_{EBO (MAX)}$	-5	V
Output Current	All I_C	-100	mA
Power Dissipation (Note 1,2)	P_d	200	mW
Thermal Resistance, Junction to Ambient Air (Note 1,2)	$R_{\theta JA}$	625	$^\circ\text{C/W}$
Operating and Storage and Temperature Range	T_j, T_{STG}	-55 to +150	$^\circ\text{C}$

Note: 1. Mounted on FR4 PC Board with recommended pad layout at <http://www.diodes.com/datasheets/ap02001.pdf>.
2. 150mW per element must not be exceeded.

Electrical Characteristics NPN Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified **R1, R2 Types**

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	DCX122LU DCX142JU $V_{I(off)}$	0.3 0.3	—	—	V	$V_{CC} = 5V, I_O = 100\mu\text{A}$
	DCX122LU DCX142JU $V_{I(on)}$	—	—	2.0 2.0	V	$V_O = 0.3V, I_O = 20\text{mA}$ $V_O = 0.3V, I_O = 20\text{mA}$
Output Voltage	$V_{O(on)}$	—	—	0.3V	V	$I_O/I_I = 5\text{mA}/0.25\text{mA}$
Input Current	DCX122LU DCX142JU 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	DCX122LU DCX142JU G_I	56 56	—	—	—	$V_O = 5V, I_O = 10\text{mA}$
Gain-Bandwidth Product*	f_T	—	200	—	MHz	$V_{CE} = 10V, I_E = 5\text{mA}, f = 100\text{MHz}$

* Transistor - For Reference Only

Electrical Characteristics NPN Section @ $T_A = 25^\circ\text{C}$ unless otherwise specified **R1 Only**

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Collector-Base Breakdown Voltage	BV_{CBO}	50	—	—	V	$I_C = 50\mu\text{A}$
Collector-Emitter Breakdown Voltage	BV_{CEO}	40	—	—	V	$I_C = 1\text{mA}$
Emitter-Base Breakdown Voltage	DCX122TU DCX142TU BV_{EBO}	5	—	—	V	$I_E = 50\mu\text{A}$ $I_E = 50\mu\text{A}$
Collector Cutoff Current	I_{CBO}	—	—	0.5	μA	$V_{CB} = 50V$
Emitter Cutoff Current	DCX122TU DCX142TU I_{EBO}	—	—	0.5 0.5	μA	$V_{EB} = 4V$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	—	—	0.3	V	$I_C = 5\text{mA}, I_B = 0.25\text{mA}$
DC Current Transfer Ratio	DCX122TU DCX142TU h_{FE}	100 100	250 250	600 600	—	$I_C = 1\text{mA}, V_{CE} = 5V$
Gain-Bandwidth Product*	f_T	—	200	—	MHz	$V_{CE} = 10V, I_E = -5\text{mA}, f = 100\text{MHz}$

* Transistor - For Reference Only

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition	
Input Voltage	DCX122LU DCX142JU	V _{I(off)}	-0.3 -0.3	—	—	V	V _{CC} = -5V, I _O = -100μA
	DCX122LU DCX142JU	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	DCX122LU DCX142JU	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	DCX122LU DCX142JU	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 PNP Section @ T_A = 25°C unless otherwise specified R1-Only Types

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	DCX122TU DCX142TU	BV _{EBO}	-5	—	—	V	I _E = -50μA I _E = -50μA
Collector Cutoff Current	I _{CBO}	—	—	-0.5	μA	V _{CB} = -50V	
Emitter Cutoff Current	DCX122TU DCX142TU	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	DCX122TU DCX142TU	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

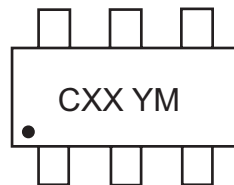
* Transistor - For Reference Only

Ordering Information (Note 4)

Device	Packaging	Shipping
DCX122LU-7-F	SOT-363	3000/Tape & Reel
DCX142JU-7-F	SOT-363	3000/Tape & Reel
DCX122TU-7-F	SOT-363	3000/Tape & Reel
DCX142TU-7-F	SOT-363	3000/Tape & Reel

Notes: 4. For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



CXX = Product Type Marking Code, See Table on Page 1
 YM = Date Code Marking
 Y = Year ex: N = 2002
 M = Month ex: 9 = September

Date Code Key

Year	2002	2003	2004	2005	2006	2007	2008	2009
Code	N	P	R	S	T	U	V	W

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

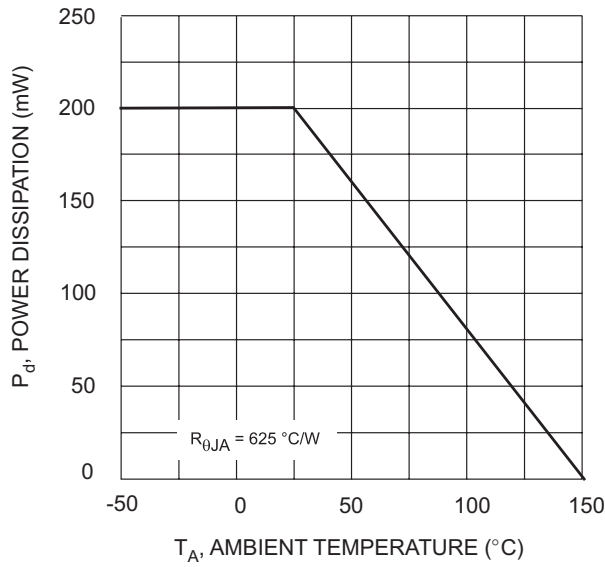


Fig. 1 Power Derating Curve

(150mW per element must not be exceeded).

IMPORTANT NOTICE

Diodes, Inc. and its subsidiaries reserve the right to make changes without further notice to any product herein to make corrections, modifications, enhancements, improvements, or other changes. Diodes, Inc. does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others. The user of products in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on our website, harmless against all damages.

LIFE SUPPORT

The products located on our website at www.diodes.com are not recommended for use in life support systems where a failure or malfunction of the component may directly threaten life or cause injury without the expressed written approval of Diodes Incorporated.