ACX114YUQ

SMALL SIGNAL COMPLEMENTARY PRE-BIASED DUAL TRANSISTOR

Features

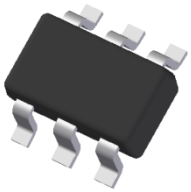
- Epitaxial Planar Die Construction
- Built-In Biasing Resistors
- Surface Mount Package Suited for Automated Assembly
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

Mechanical Data

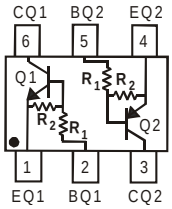
- Case: SOT363
- Case Material: Molded Plastic, "Green" Molding Compound; UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin Plated Leads, Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.006 grams (Approximate)

R1(NOM)	R2(NOM)
10kΩ	47kΩ

SOT363



Top View



Device Schematic

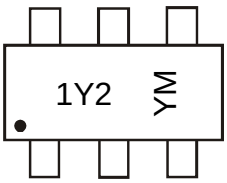
Ordering Information (Notes 4 & 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
ACX114YUQ-7R	Automotive	1Y2	7	8	3,000
ACX114YUQ-13R	Automotive	1Y2	13	8	10,000

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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/quality/product_compliance_definitions/.
5. -13R are parts rotated in the pocket tape by +180°. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information

SOT363



1Y2 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: D = 2016)
M = Month (ex: 9 = September)

Date Code Key

Year	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Code	D	E	F	G	H	I	J	K	L	M	N

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

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

Characteristic	Symbol	Value	Unit
Supply Voltage <Pin: (6) to (1)>	V_{CC}	50	V
Input Voltage <Pin: (2) to (1)>	V_{IN}	-6 to +40	V
Output Current	I_O	70	mA
Output Current	I_C (Max)	100	mA

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

Characteristic	Symbol	Value	Unit
Supply Voltage <Pin: (4) to (3)>	V_{CC}	-50	V
Input Voltage <Pin: (5) to (4)>	V_{IN}	+6 to -40	V
Output Current	I_O	-70	mA
Output Current	I_C (Max)	-100	mA

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 6 & 7)	P_D	270	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	450	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Notes: 6. Mounted on FR4 PC Board with minimum recommended pad layout.
7. 150mW per element must not be exceeded.

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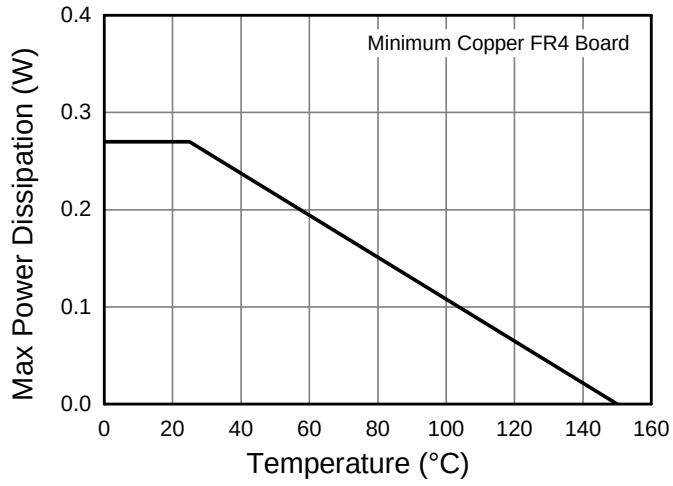
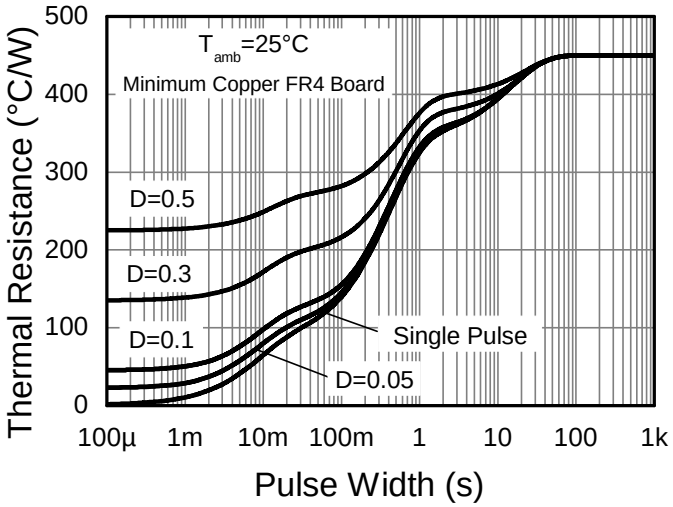
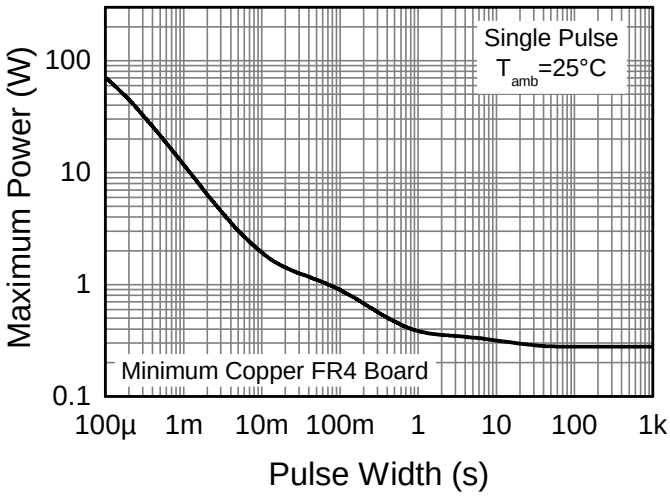
Thermal Characteristics and Derating Information



Derating Curve



Transient Thermal Impedance



Pulse Power Dissipation

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Electrical Characteristics - NPN Section (@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 = 100μA
	$V_{I(ON)}$	—	—	1.4		V_O = 0.3V, I_O = 1mA
Output Voltage	$V_{O(ON)}$	—	0.1	0.3	V	I_O/I_I = 5mA / 0.25mA
Input Current	I_I	—	—	0.88	mA	V_I = 5V
Output Current	$I_{O(OFF)}$	—	—	0.5	μA	V_{CC} = 50V, V_I = 0V
DC Current Gain (Note 8)	G_I	80	—	—	—	V_O = 5V, I_O = 10mA
Input Resistor (R_1) Tolerance	ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance	$\Delta R_2/R_1$	-20	—	+20	%	—
Gain-Bandwidth Product	f_T	—	250	—	MHz	V_{CE} = 10V, I_E = 5mA, f = 100MHz

Electrical Characteristics - PNP Section (@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 = -100μA
	$V_{I(ON)}$	—	—	-1.4		V_O = -0.3V, I_O = -1mA
Output Voltage	$V_{O(ON)}$	—	-0.1	-0.3	V	I_O/I_I = -5mA / -0.25mA
Input Current	I_I	—	—	-0.88	mA	V_I = -5V
Output Current	$I_{O(OFF)}$	—	—	-0.5	μA	V_{CC} = -50V, V_I = 0V
DC Current Gain (Note 8)	G_I	80	—	—	—	V_O = -5V, I_O = -10mA
Input Resistor (R_1) Tolerance	ΔR_1	-30	—	+30	%	—
Resistance Ratio Tolerance	$\Delta R_2/R_1$	-20	—	+20	%	—
Gain-Bandwidth Product	f_T	—	250	—	MHz	V_{CE} = -10V, I_E = -5mA, f = 100MHz

Note: 8. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.

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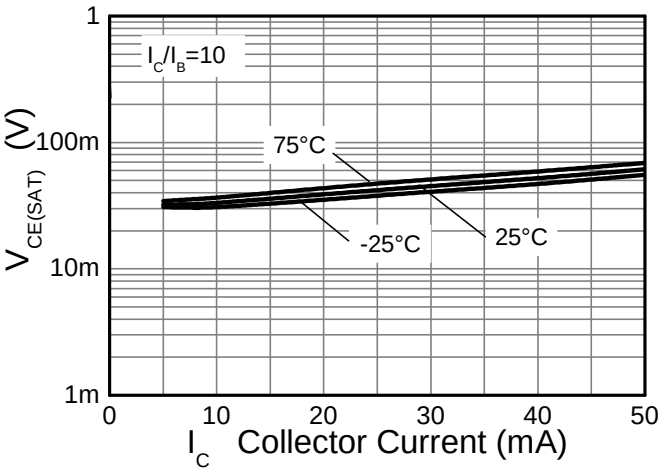
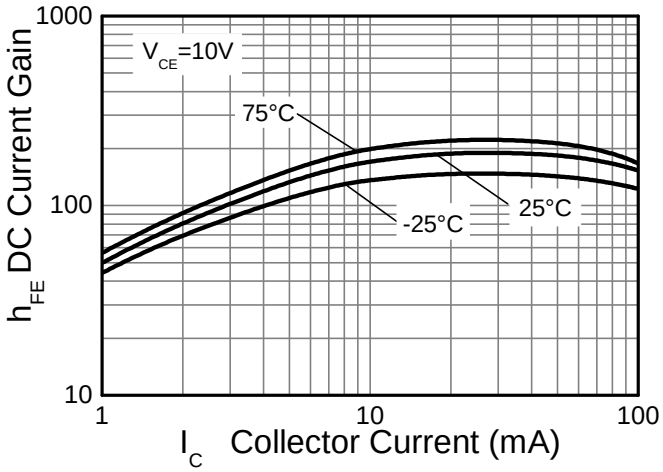
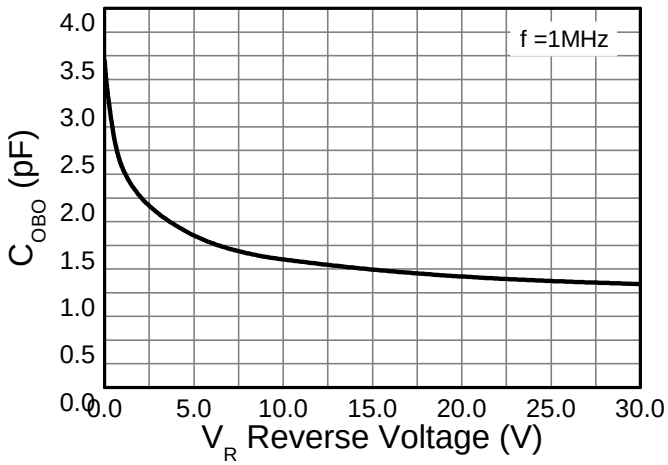
Typical Electrical Characteristics – NPN Section (@T_A = +25°C, unless otherwise specified.)



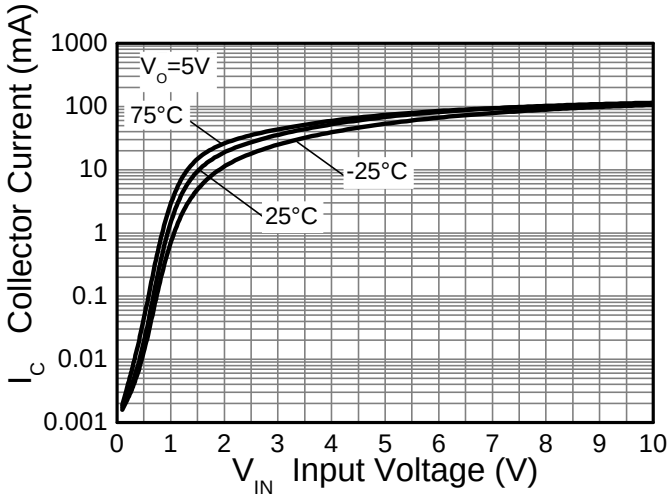
$V_{CE(SAT)}$ v Collector Current



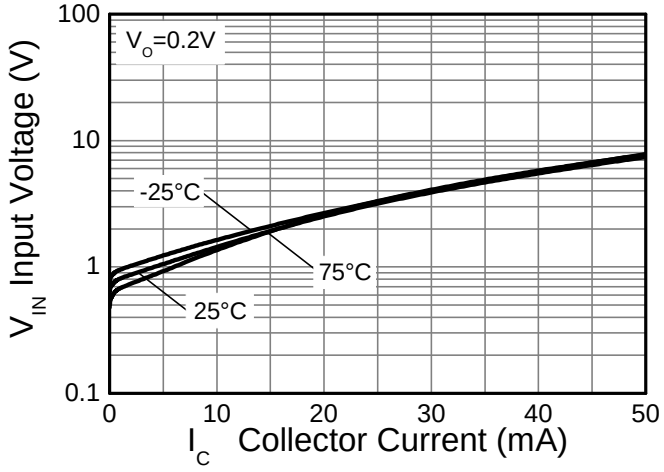
h_{FE} v Collector Current



Output Capacitance



Collector Current v Input Voltage



Input Voltage v Collector Current

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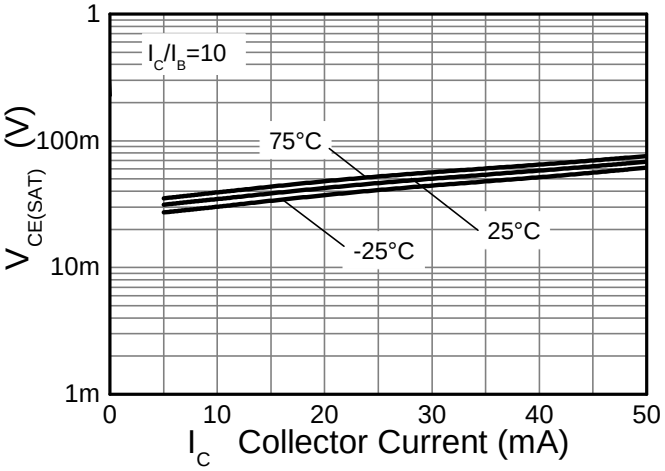
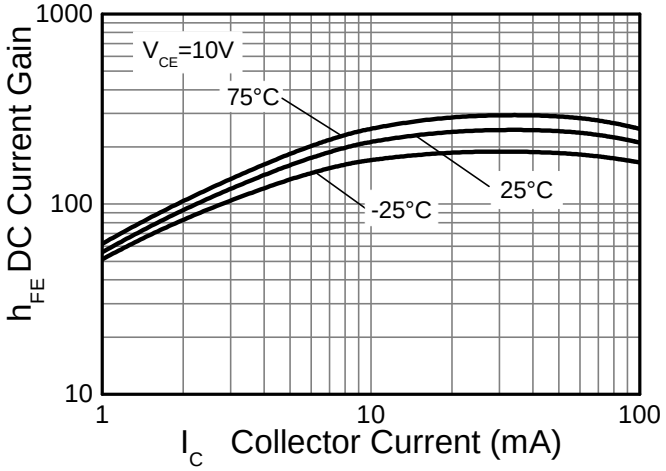
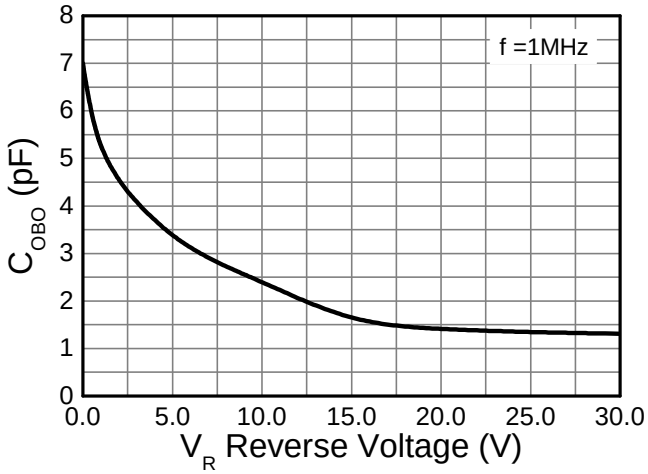
Typical Electrical Characteristics – PNP Section (@T_A = +25°C, unless otherwise specified.)



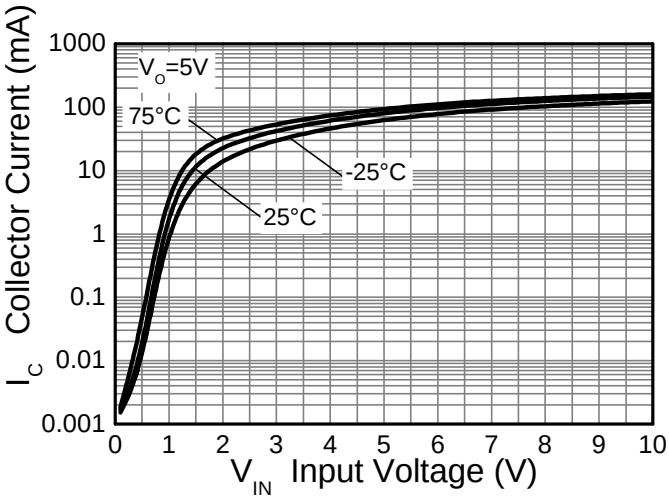
$V_{CE(SAT)}$ v Collector Current



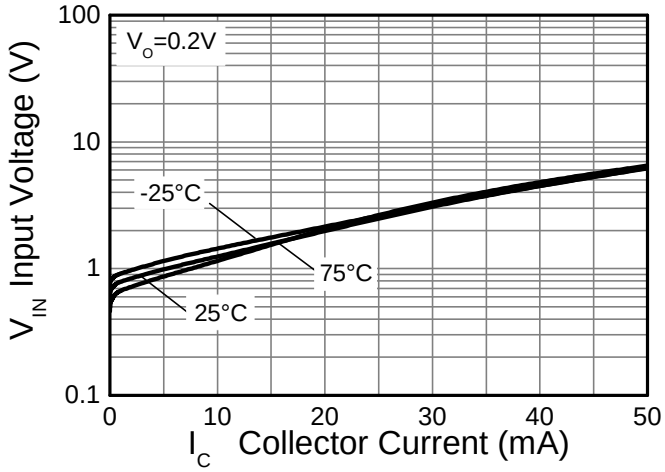
h_{FE} v Collector Current



Output Capacitance



Collector Current v Input Voltage



Input Voltage v Collector Current

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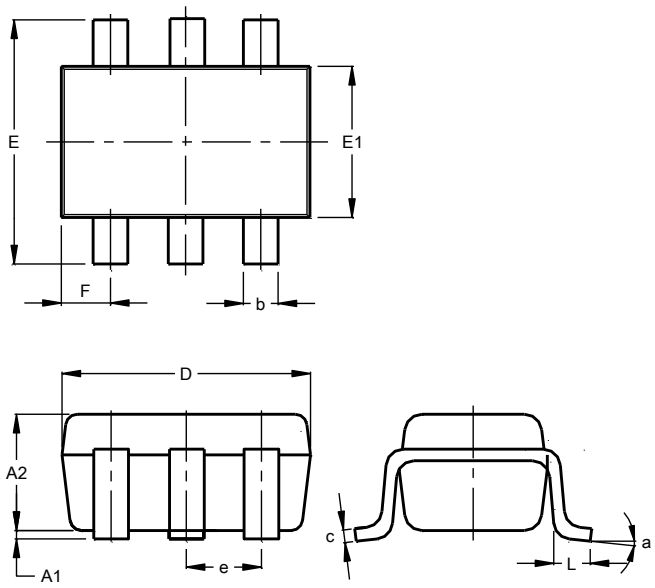
Package Outline Dimensions

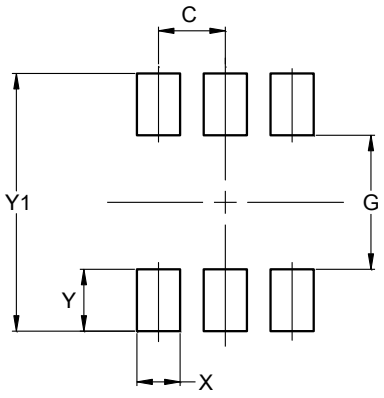
Please see http://www.diodes.com/package-outlines.html for the latest version.



SOT363			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	1.00
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

Please see http://www.diodes.com/package-outlines.html for the latest version.



Dimensions	Value (in mm)
C	0.650
G	1.300
X	0.420
Y	0.600
Y1	2.500

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