

**SMALL SIGNAL COMPLEMENTARY PRE-BIASED DUAL TRANSISTOR**

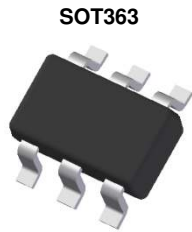
**Features**

- 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)**

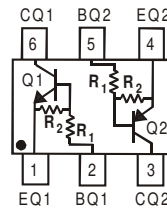
**Mechanical Data**

- 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)

<b>R1(NOM)</b>	<b>R2(NOM)</b>
10kΩ	47kΩ



Top View



Device Schematic

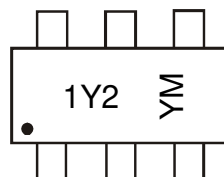
**Ordering Information** (Notes 4 & 5)

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](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/](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** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)
 

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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

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**Absolute Maximum Ratings - PNP Section** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)
 

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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

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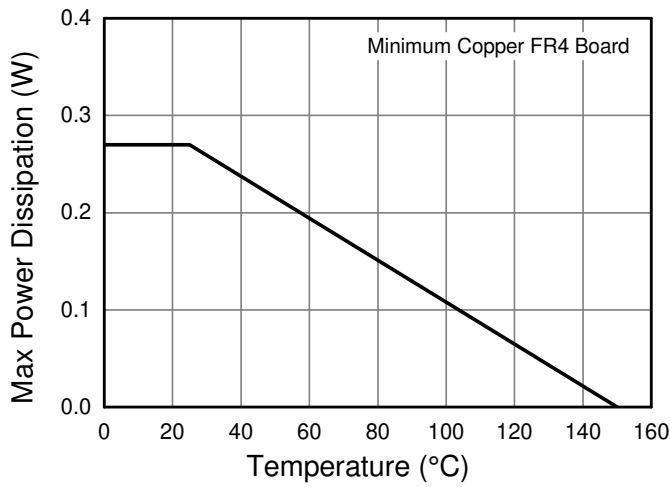
**Thermal Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)
 

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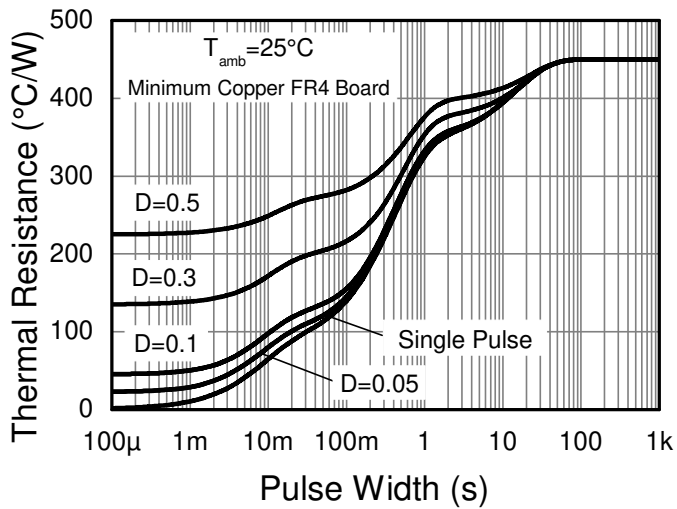
Characteristic	Symbol	Value	Unit
Power Dissipation (Notes 6 & 7)	$P_D$	270	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	450	$^\circ\text{C}/\text{W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

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

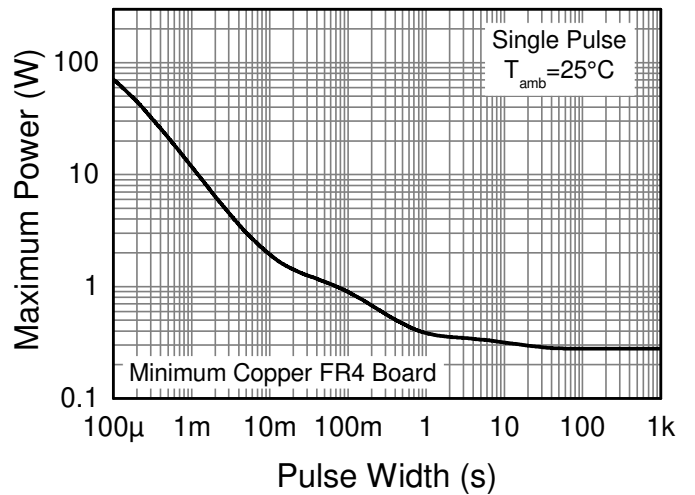
**Thermal Characteristics and Derating Information**



**Derating Curve**



**Transient Thermal Impedance**



**Pulse Power Dissipation**

**Electrical Characteristics - NPN Section** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

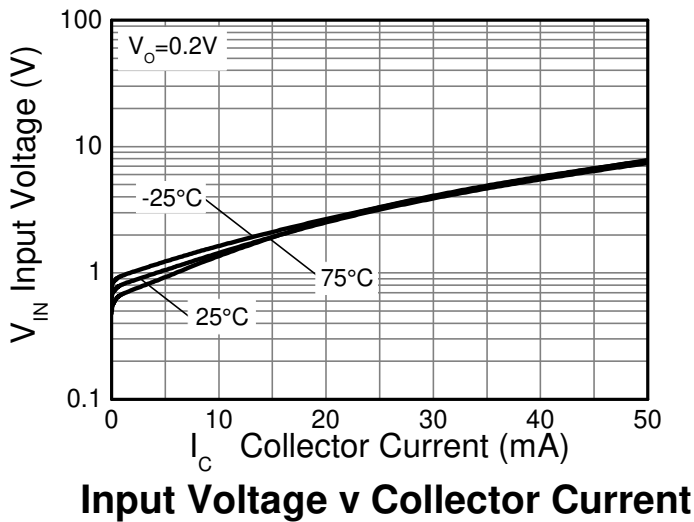
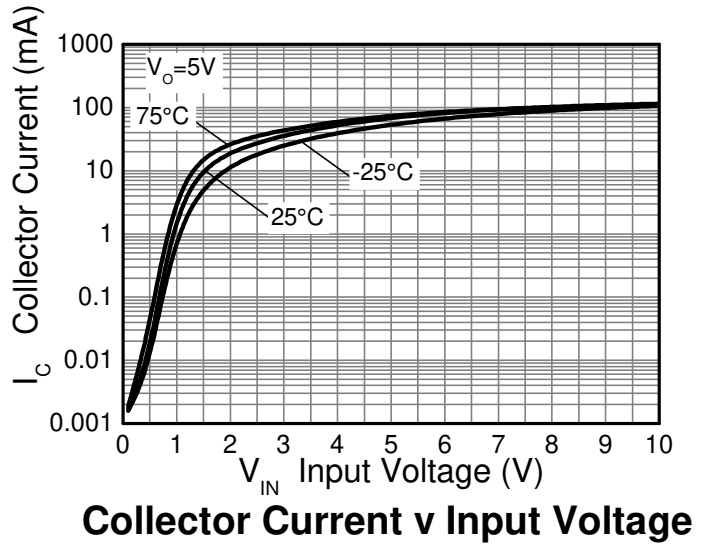
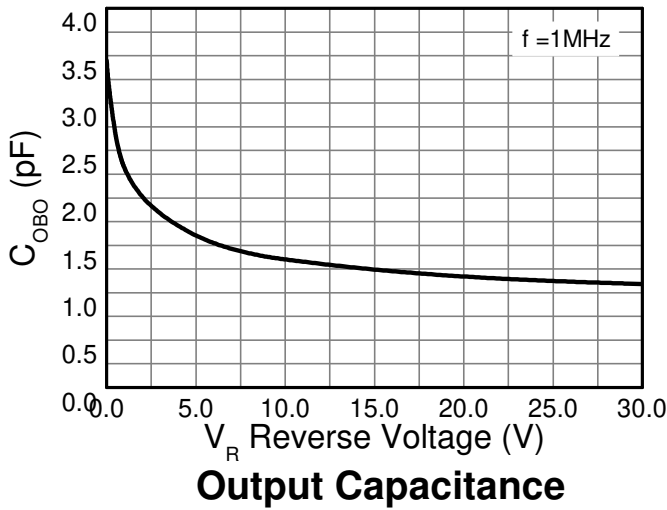
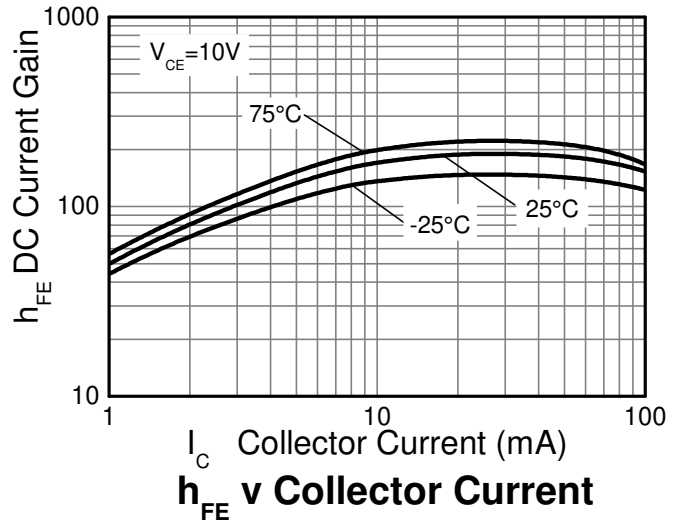
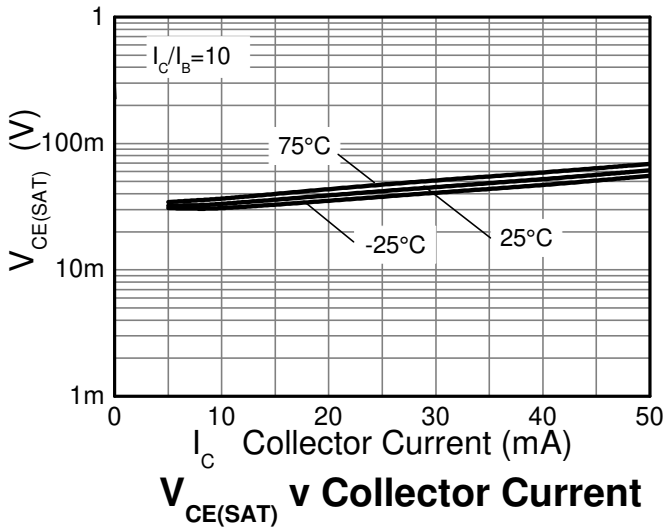
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(OFF)}$	0.3	—	—	V	$V_{CC} = 5V, I_O = 100\mu\text{A}$
	$V_{I(ON)}$	—	—	1.4		$V_O = 0.3V, I_O = 1\text{mA}$
Output Voltage	$V_{O(ON)}$	—	0.1	0.3	V	$I_O/I_I = 5\text{mA} / 0.25\text{mA}$
Input Current	$I_I$	—	—	0.88	mA	$V_I = 5V$
Output Current	$I_{O(OFF)}$	—	—	0.5	$\mu\text{A}$	$V_{CC} = 50V, V_I = 0V$
DC Current Gain (Note 8)	$G_I$	80	—	—	—	$V_O = 5V, I_O = 10\text{mA}$
Input Resistor ( $R_1$ ) Tolerance	$\Delta R_1$	-30	—	+30	%	—
Resistance Ratio Tolerance	$\Delta R_2/R_1$	-20	—	+20	%	—
Gain-Bandwidth Product	$f_T$	—	250	—	MHz	$V_{CE} = 10V, I_E = 5\text{mA}, f = 100\text{MHz}$

**Electrical Characteristics - PNP Section** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

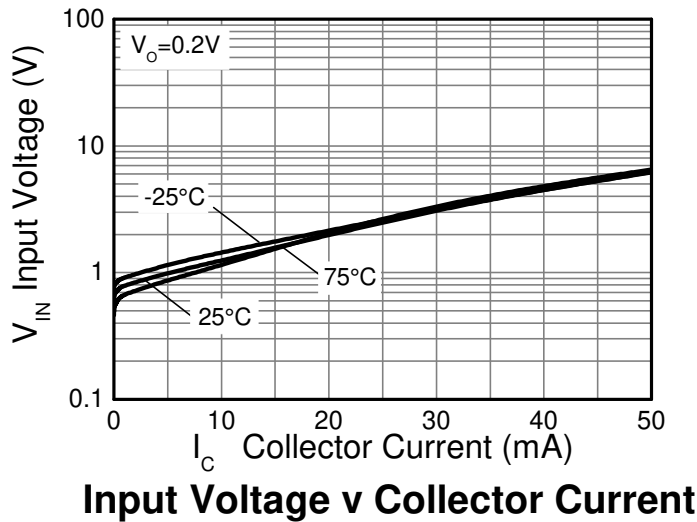
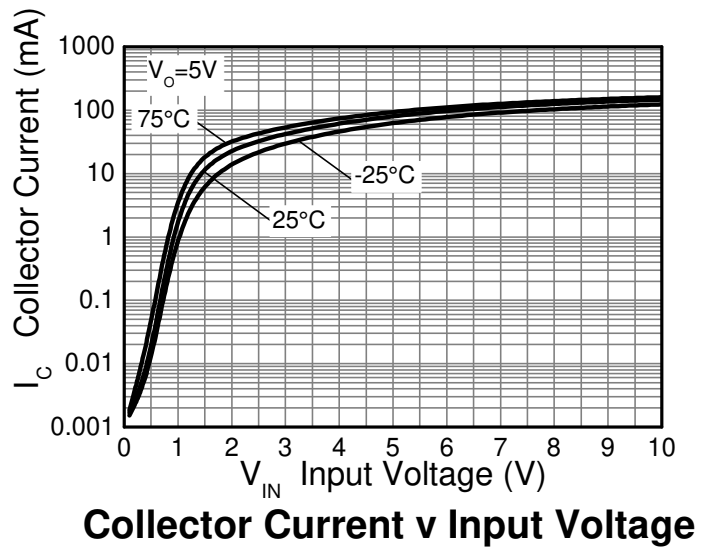
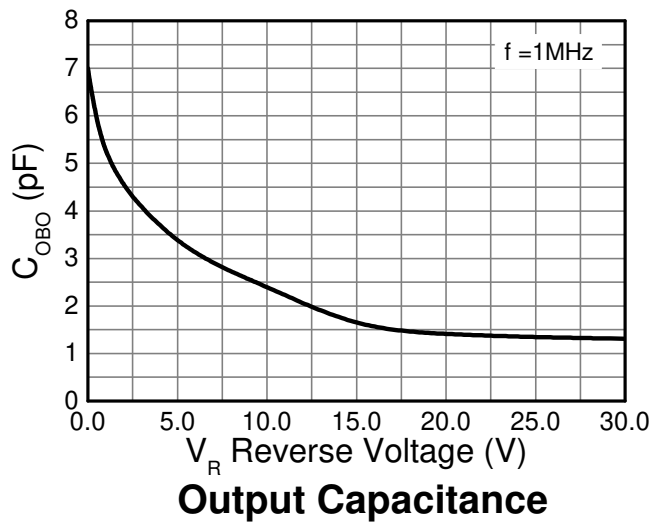
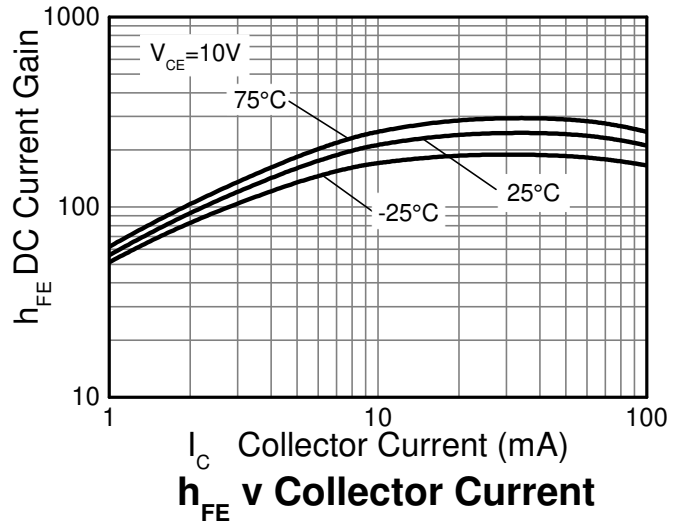
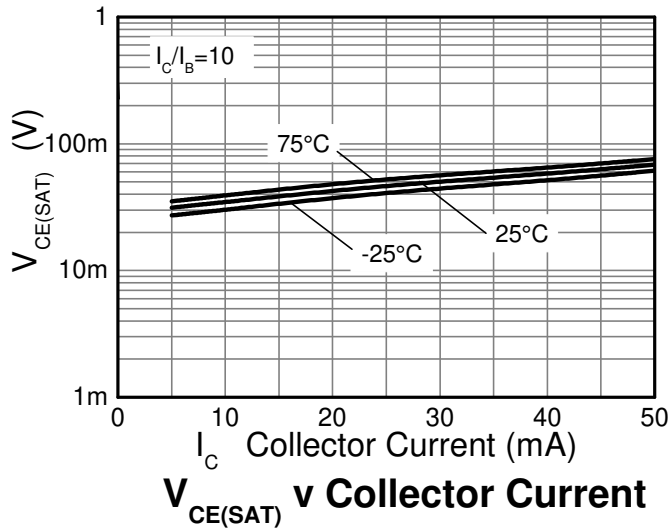
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	$V_{I(OFF)}$	-0.3	—	—	V	$V_{CC} = -5V, I_O = -100\mu\text{A}$
	$V_{I(ON)}$	—	—	-1.4		$V_O = -0.3V, I_O = -1\text{mA}$
Output Voltage	$V_{O(ON)}$	—	-0.1	-0.3	V	$I_O/I_I = -5\text{mA} / -0.25\text{mA}$
Input Current	$I_I$	—	—	-0.88	mA	$V_I = -5V$
Output Current	$I_{O(OFF)}$	—	—	-0.5	$\mu\text{A}$	$V_{CC} = -50V, V_I = 0V$
DC Current Gain (Note 8)	$G_I$	80	—	—	—	$V_O = -5V, I_O = -10\text{mA}$
Input Resistor ( $R_1$ ) Tolerance	$\Delta R_1$	-30	—	+30	%	—
Resistance Ratio Tolerance	$\Delta R_2/R_1$	-20	—	+20	%	—
Gain-Bandwidth Product	$f_T$	—	250	—	MHz	$V_{CE} = -10V, I_E = -5\text{mA}, f = 100\text{MHz}$

Note: 8. Measured under pulsed conditions. Pulse width  $\leq 300\mu\text{s}$ . Duty cycle  $\leq 2\%$ .

**Typical Electrical Characteristics – NPN Section** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

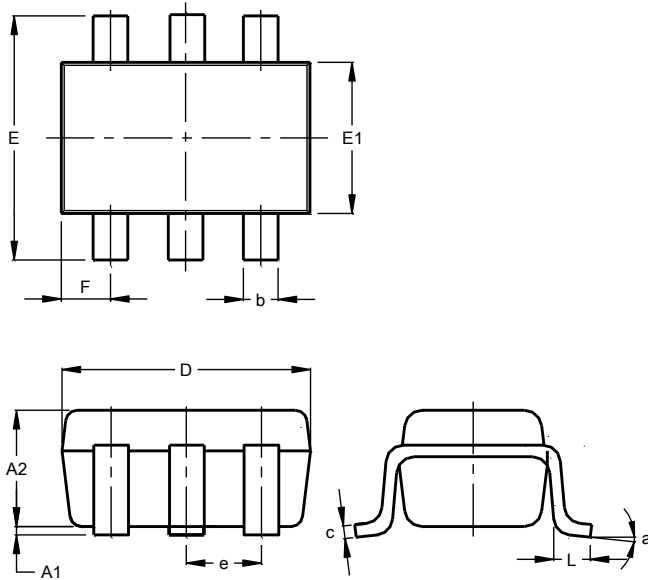


**Typical Electrical Characteristics – PNP Section** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



**Package Outline Dimensions**

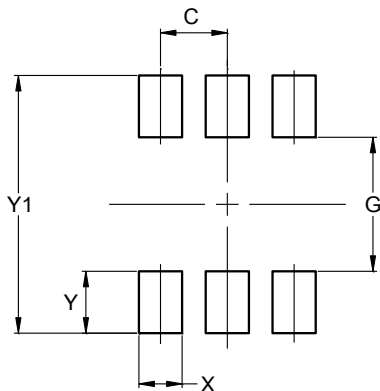
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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°	--
<b>All Dimensions in mm</b>			

**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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