Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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DUAL COMPLEMENTARY PRE-BIASED TRANSISTORS

Features

- Ultra-Small Surface Mount Package
- Surface Mount Package Suited for Automated Assembly
- Simplifies Circuit Design and Reduces Board Space
- **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)**

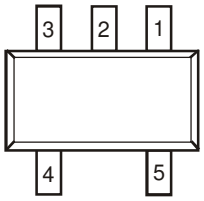
Mechanical Data

- Case: SOT353
- 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)

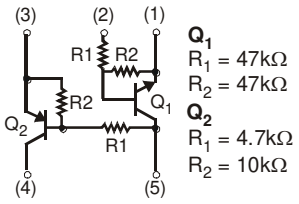
SOT353

Top View

Bottom View



Package Pin Out Configuration



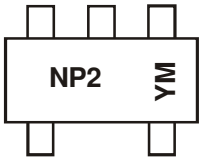
Device Schematic

Ordering Information (Notes 4 & 5)

Part Number	Compliance	Marking	Reel Size (inch)	Tape Width (mm)	Quantity per Reel
UMC5NQ-7	Automotive	NP2	7	8	3,000

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/product_compliance_definitions.html.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.

Marking Information



NP2 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: E = 2017)
M = Month (ex: 9 = September)

Date Code Key

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

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

Absolute Maximum Ratings, Pre-Biased NPN Transistor, Q_1 (@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	30	mA
Collector Current	$I_{C(MAX)}$	100	mA

Absolute Maximum Ratings, Pre-Biased PNP Transistor, Q_2 (@T_A = +25°C unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Supply Voltage	V_{CC}	-50	V
Input Voltage	V_{IN}	-20 to +7	V
Output Current	I_O	-100	mA
Collector Current	$I_{C(MAX)}$	-100	mA

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	290	mW
Thermal Resistance, Junction to Ambient Air (Note 6)	$R_{\theta JA}$	430	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

Note: 6. Device mounted on FR-4 PCB; pad layout as shown on Diodes Incorporated suggested pad layout document, which can be found on our website at http://www.diodes.com/package-outlines.html.

Electrical Characteristics, Pre-Biased NPN Transistor, Q_1 (@T_A = +25°C unless otherwise specified.)

Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	(Note 7)	$V_{I(OFF)}$	0.5	—	—	V	V_{CC} = 5V, I_O = 100μA
	(Note 8)	$V_{I(ON)}$	—	—	3	V	V_O = 0.3V, I_O = 2mA
Output Voltage		$V_{O(ON)}$	—	0.1	0.3	V	I_O/ I_I = 10mA/0.5 mA
Input Current		I_I	—	—	0.18	mA	V_I = 5V
Output Current		$I_{O(OFF)}$	—	—	0.5	μA	V_{CC} = 50V, V_I = 0V
DC Current Gain		G_I	68	—	—	—	V_O = 5V, I_O = 5mA
Gain-Bandwidth Product (Note 9)		f_T	—	250	—	MHz	V_{CE} = 10V, I_E = -5mA, f = 100MHz
Input Resistance		R_1	32.9	47	61.1	kΩ	—
Resistance Ratio		R_2/R_1	0.8	1	1.2	—	—

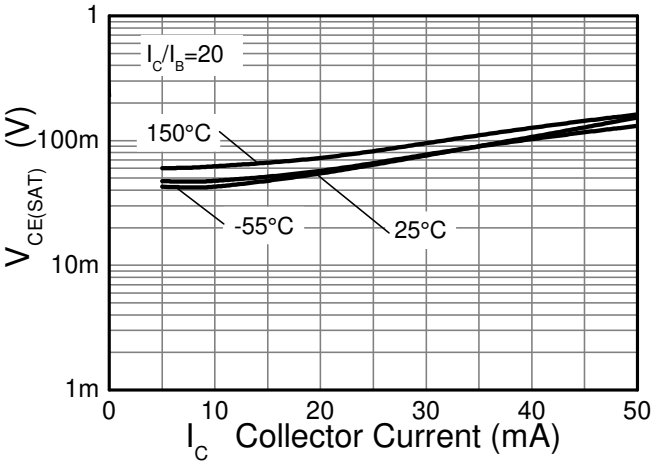
Notes: 7. The device is guaranteed to be in "OFF" state with $V_{I(OFF)}$ up to 0.5V.
8. The device is guaranteed to be in "ON" state with $V_{I(ON)}$ starting from 3V.
9. Characteristic of Transistor – for reference only.

Electrical Characteristics, Pre-Biased PNP Transistor, Q_2 (@T_A = +25°C unless otherwise specified.)

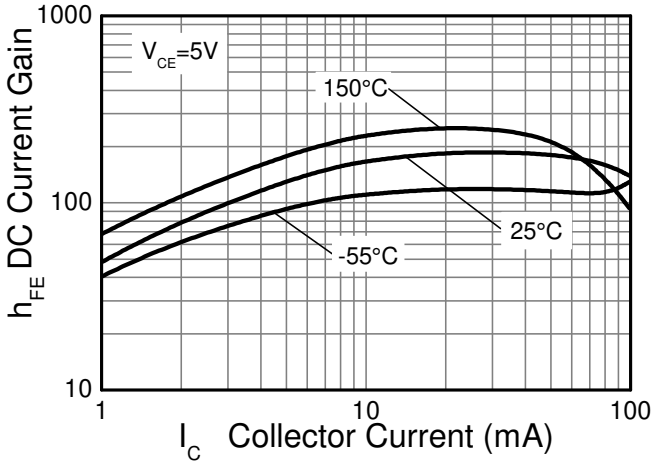
Characteristic		Symbol	Min	Typ	Max	Unit	Test Condition
Input Voltage	(Note 10)	$V_{I(OFF)}$	-0.3	—	—	V	V_{CC} = -5V, I_O = -100μA
	(Note 11)	$V_{I(ON)}$	—	—	-2.5	V	V_O = -0.3V, I_O = -20mA
Output Voltage		$V_{O(ON)}$	—	-0.1	-0.3	V	I_O/ I_I = -10mA/-0.5 mA
Input Current		I_I	—	—	-1.8	mA	V_I = -5V
Output Current		$I_{O(OFF)}$	—	—	-0.5	μA	V_{CC} = -50V, V_I = 0V
DC Current Gain		G_I	30	—	—	—	V_O = -5V, I_O = -10mA
Gain-Bandwidth Product (Note 9)		f_T	—	250	—	MHz	V_{CE} = -10V, I_E = 5mA, f = 100MHz
Input Resistance		R_1	3.29	4.7	6.11	kΩ	—
Resistance Ratio		R_2/R_1	1.7	2.1	2.6	—	—

Notes: 10. The device is guaranteed to be in "OFF" state with $V_{I(OFF)}$ up to -0.3V.
11. The device is guaranteed to be in "ON" state with $V_{I(ON)}$ starting from -2.5V.

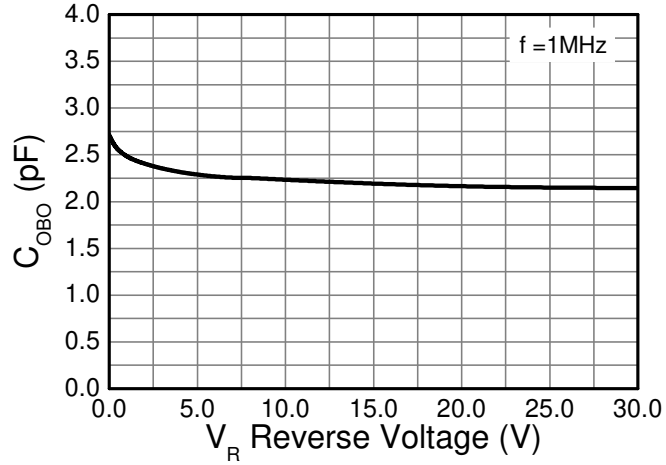
Typical Electrical Characteristics – NPN Section (@T_A = +25°C, unless otherwise specified.)



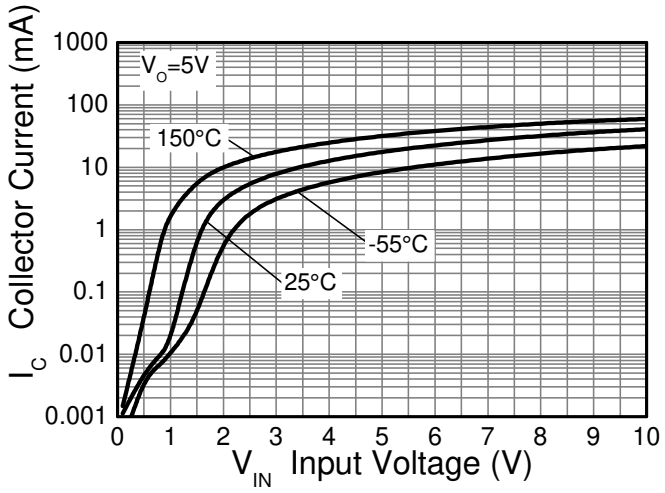
$V_{CE(SAT)}$ v Collector Current



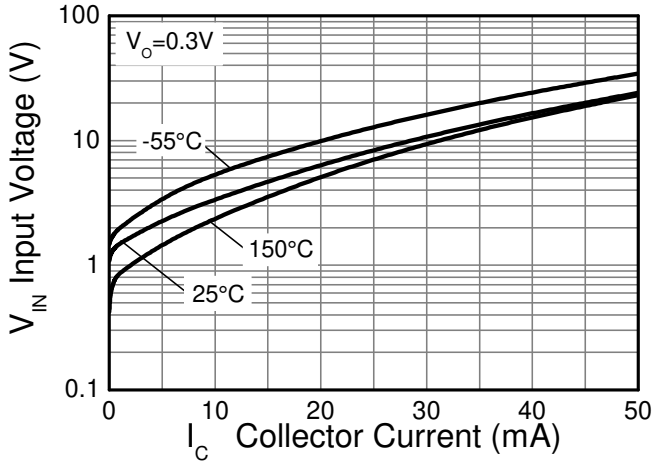
h_{FE} v Collector Current



Output Capacitance

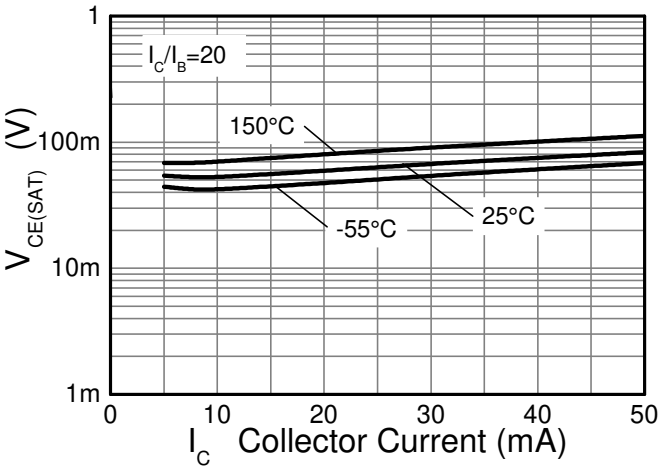


Collector Current v Input Voltage

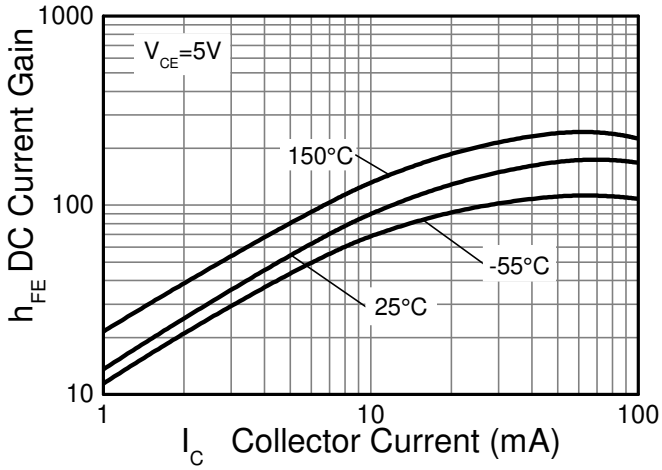


Input Voltage v Collector Current

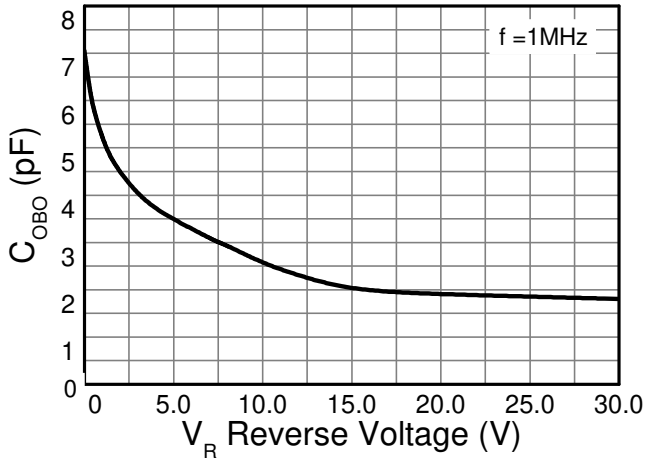
Typical Electrical Characteristics – PNP Section (@T_A = +25°C, unless otherwise specified.)



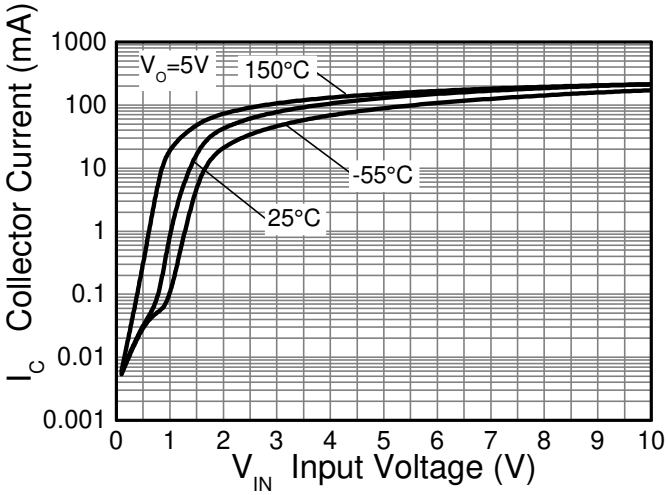
$V_{CE(SAT)}$ v Collector Current



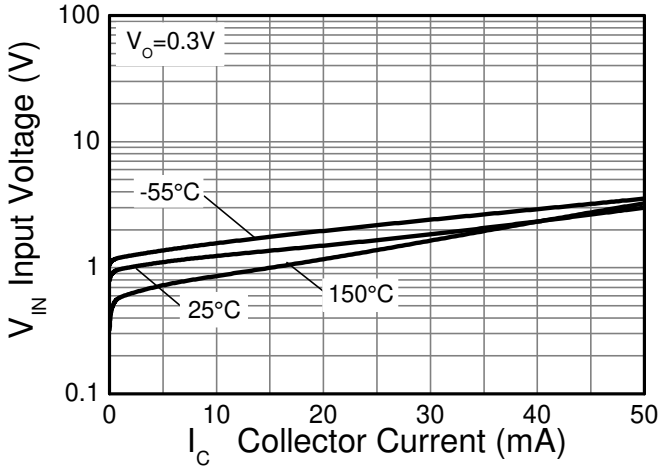
h_{FE} v Collector Current



Output Capacitance



Collector Current v Input Voltage

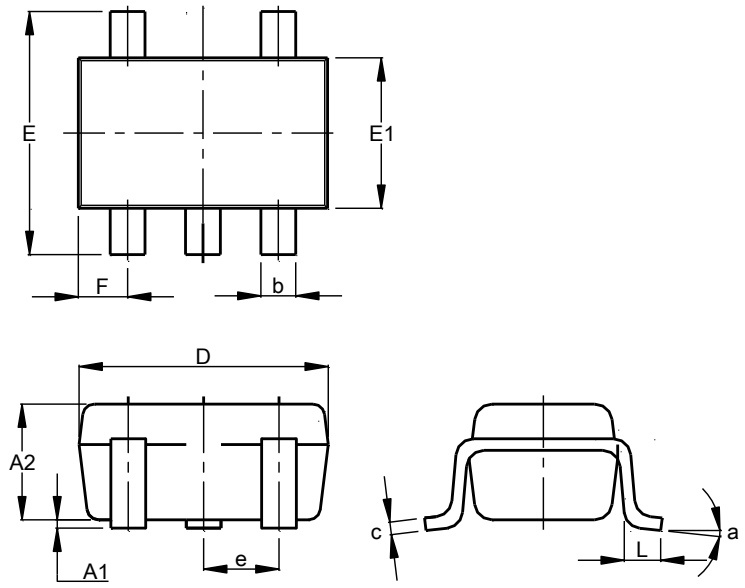


Input Voltage v Collector Current

Package Outline Dimensions

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

SOT353

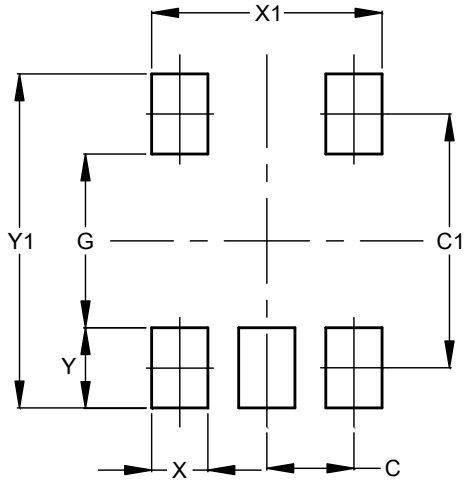


SOT353			
Dim	**Min**	**Max**	**Typ**
A1	0.00	0.10	0.05
A2	0.90	1.00	1.00
b	0.10	0.30	0.25
c	0.10	0.22	0.11
D	1.80	2.20	2.15
E	2.00	2.20	2.10
E1	1.15	1.35	1.30
e	0.650 BSC		
F	0.40	0.45	0.425
L	0.25	0.40	0.30
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT353



Dimensions	Value (in mm)
C	0.650
C1	1.900
G	1.300
X	0.420
X1	1.720
Y	0.600
Y1	2.500

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