



DUAL COMPLEMENTARY PRE-BIASED TRANSISTORS

Features

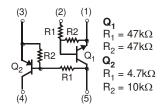
- Ultra-Small Surface Mount Package
- Surface Mount Package Suited for Automated Assembly
- Simplifies Circuit Design and Reduces Board Space
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free. "Green" Device (Note 3)
- Qualified to AEC-Q101 Standards for High Reliability
- 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 (§3)
- Weight: 0.006 grams (Approximate)







Package Pin Out Configuration

Device Schematic

Ordering Information (Notes 4 & 5)

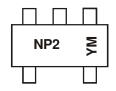
Top View

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-0101 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	20	18	2019	2020	20	21	2022	2023	20	24	2025
Code	Е	F	=	G	Н		I	J	K	L	-	М
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



Absolute Maximum Ratings, Pre-Biased NPN Transistor, Q₁ (@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	lo	30	mA
Collector Current	I _{C(MAX)}	100	mA

Absolute Maximum Ratings, Pre-Biased PNP Transistor, Q2 (@TA = +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 ₀	-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)	$R_{ hetaJA}$	430	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

Note:

Electrical Characteristics, Pre-Biased NPN Transistor, Q₁ (@T_A = +25°C unless otherwise specified.)

Characteristic		Symbol	Min	Тур	Max	Unit	Test Condition
Input Voltage	(Note 7)	$V_{I(OFF)}$	0.5			٧	$V_{CC} = 5V, I_{O} = 100 \mu A$
Input voltage	(Note 8)	V _{I(ON)}			3	٧	$V_O = 0.3V$, $I_O = 2mA$
Output Voltage		V _{O(ON)}		0.1	0.3	V	$I_0/I_1 = 10 \text{mA}/0.5 \text{ mA}$
Input Current		lı			0.18	mA	$V_I = 5V$
Output Current		I _{O(OFF)}			0.5	μΑ	$V_{CC} = 50V, V_I = 0V$
DC Current Gain		Gı	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, Q2 (@TA = +25°C unless otherwise specified.)

Characteristic		Symbol	Min	Тур	Max	Unit	Test Condition
Input Voltage	(Note 10)	$V_{I(OFF)}$	-0.3	_	_	V	$V_{CC} = -5V$, $I_{O} = -100\mu A$
Imput voltage	(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	$I_{O}/I_{I} = -10 \text{mA}/-0.5 \text{ mA}$
Input Current		I _I		_	-1.8	mA	$V_I = -5V$
Output Current		I _{O(OFF)}	_	_	-0.5	μΑ	$V_{CC} = -50V, V_{I} = 0V$
DC Current Gain		Gı	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	_	

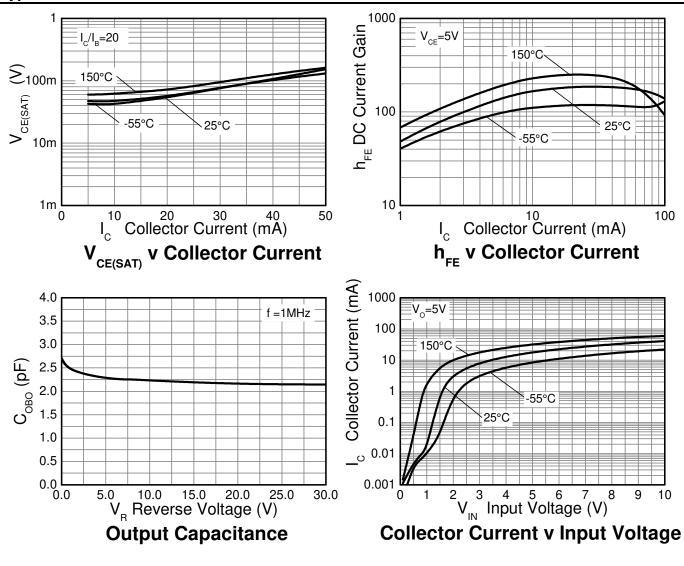
Notes:

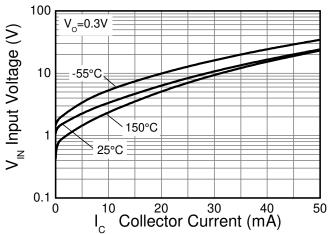
- 10. The device is guaranteed to be in "OFF" state with $V_{I(OFF)}$ up to -0.3V.
- 11. The device is guaranteed to be in "ON" state with $V_{I(ON)}$ starting from -2.5V.

^{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.



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

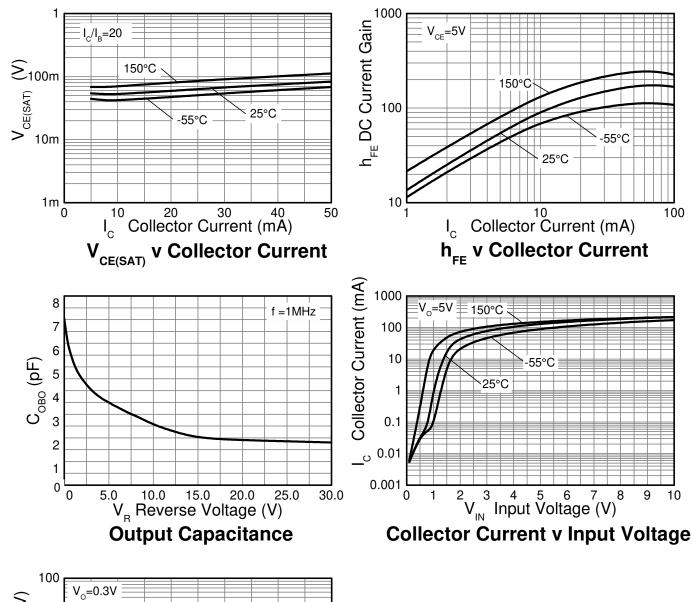


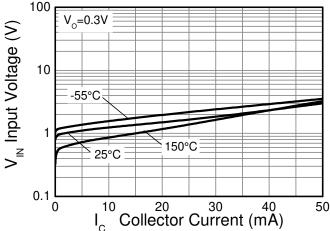


Input Voltage v Collector Current



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





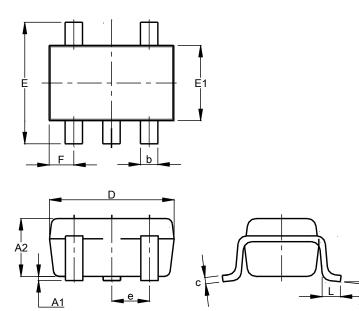
Input Voltage v Collector Current



Package Outline Dimensions

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

SOT353

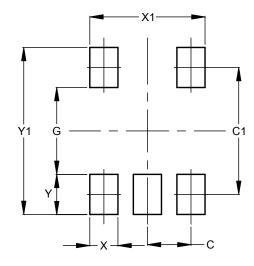


	SOT353							
Dim	Min	Тур						
A1	0.00	0.10	0.05					
A2	0.90	1.00	1.00					
b	0.10	0.30	0.25					
С	0.10	0.22	0.11					
D	1.80	2.20	2.15					
Е	2.00	2.20	2.10					
E1	1.15	1.35	1.30					
е	C).650 B	SC					
F	0.40 0.45 0.425							
L	0.25	0.40	0.30					
а	0°	8°						
All Dimensions in mm								

Suggested Pad Layout

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

SOT353



Dimensions	Value			
Dilliensions	(in mm)			
С	0.650			
C1	1.900			
G	1.300			
Х	0.420			
X1	1.720			
Υ	0.600			
Y1	2.500			



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