2N1303 2N1305
2N1307 2N1309

GERMANIUM
PNP TRANSISTORS

TO-5 CASE

Central Semiconductor Corp.

www.centralsemi.com

DESCRIPTION:

The CENTRAL SEMICONDUCTOR 2N1303, 2N1305, 2N1307, and 2N1309 are germanium PNP transistors designed for computer and switching applications.

MARKING: FULL PART NUMBER

MAXIMUM RATINGS: (T_A=25°C)	**SYMBOL**		**UNITS**
Collector-Base Voltage	V_{CBO}	30	V
Emitter-Base Voltage	V_{EBO}	25	V
Continuous Collector Current	I_C	300	mA
Power Dissipation	P_D	150	mW
Operating Junction Temperature	T_J	-65 to +85	°C
Storage Temperature	T_{stg}	-65 to +100	°C

ELECTRICAL CHARACTERISTICS: (T_A=25°C)

SYMBOL	**TEST CONDITIONS**	**MIN**	**TYP**	**MAX**	**UNITS**
I_{CBO}	V_{CB}=25V			10	μA
I_{EBO}	V_{EB}=25V			10	μA
BV_{CBO}	I_C=100μA	30			V
BV_{EBO}	I_E=100μA	25			V
$V_{CE(SAT)}$	I_C=10mA, I_B=0.5mA (2N1303)			0.20	V
$V_{CE(SAT)}$	I_C=10mA, I_B=0.25mA (2N1305)			0.20	V
$V_{CE(SAT)}$	I_C=10mA, I_B=0.17mA (2N1307)			0.20	V
$V_{CE(SAT)}$	I_C=10mA, I_B=0.13mA (2N1309)			0.20	V
$V_{BE(SAT)}$	I_C=10mA, I_B=0.5mA (2N1303)	0.15		0.40	V
$V_{BE(SAT)}$	I_C=10mA, I_B=0.5mA (2N1305, 07, 09)	0.15		0.35	V
h_{FE}	V_{CE}=1.0V, I_C=10mA (2N1303)	20			
h_{FE}	V_{CE}=1.0V, I_C=10mA (2N1305)	40		200	
h_{FE}	V_{CE}=1.0V, I_C=10mA (2N1307)	60		300	
h_{FE}	V_{CE}=1.0V, I_C=10mA (2N1309)	80			
h_{FE}	V_{CE}=0.35V, I_C=200mA (2N1303)	10			
h_{FE}	V_{CE}=0.35V, I_C=200mA (2N1305)	15			
h_{FE}	V_{CE}=0.35V, I_C=200mA (2N1307, 09)	20			
h_{ib}	V_{CB}=5.0V, I_E=1.0mA, f=1.0kHz		29		Ω
h_{rb}	V_{CB}=5.0V, I_E=1.0mA, f=1.0kHz		7.0		$x10^{-4}$
h_{ob}	V_{CB}=5.0V, I_E=1.0mA, f=1.0kHz		0.40		μS
h_{fe}	V_{CB}=5.0V, I_E=1.0mA, f=1.0kHz		140		
NF	V_{CB}=5.0V, I_E=1.0mA, f=1.0kHz		3.0		dB
C_{ob}	V_{CB}=5.0V, f=1.0MHz			20	pF
C_{ib}	V_{EB}=5.0V, f=1.0MHz		9.0		pF

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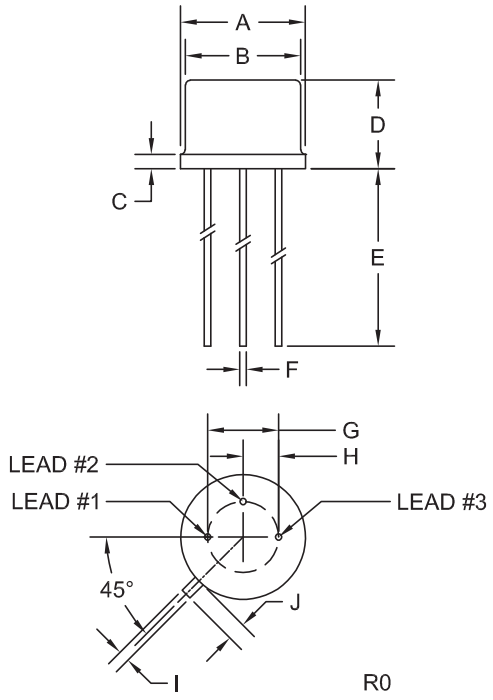
GERMANIUM
PNP TRANSISTORS

ELECTRICAL CHARACTERISTICS - Continued: (T_A=25°C)

SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
t_d			0.06		μs
t_r	I_C=10mA, I_{B1}=1.3mA, I_{B2}=0.7mA		0.16		μs
t_s	$V_{BE(OFF)}$=0.8V, R_L=1.0kΩ		0.75		μs
t_f			0.35		μs
f_{hfb}	V_{CB}=5.0V, I_E=1.0mA (2N1303)	3.0			MHz
f_{hfb}	V_{CB}=5.0V, I_E=1.0mA (2N1305)	5.0			MHz
f_{hfb}	V_{CB}=5.0V, I_E=1.0mA (2N1307)	10			MHz
f_{hfb}	V_{CB}=5.0V, I_E=1.0mA (2N1309)	15			MHz

TO-5 CASE - MECHANICAL OUTLINE



DIMENSIONS				
	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A (DIA)	0.335	0.370	8.51	9.40
B (DIA)	0.315	0.335	8.00	8.51
C	-	0.040	-	1.02
D	0.240	0.260	6.10	6.60
E	1.500	1.752	38.1	44.5
F (DIA)	0.016	0.021	0.41	0.53
G (DIA)	0.200		5.08	
H	0.100		2.54	
I	0.028	0.034	0.71	0.86
J	0.029	0.045	0.74	1.14

TO-5 (REV: R0)

LEAD CODE:
1) Emitter
2) Base
3) Collector

MARKING: FULL PART NUMBER

R1 (5-May 2014)

OUTSTANDING SUPPORT AND SUPERIOR SERVICES

PRODUCT SUPPORT

Central's operations team provides the highest level of support to insure product is delivered on-time.

- Supply management (Customer portals)
- Inventory bonding
- Consolidated shipping options
- Custom bar coding for shipments
- Custom product packing

DESIGNER SUPPORT/SERVICES

Central's applications engineering team is ready to discuss your design challenges. Just ask.

- Free quick ship samples (2nd day air)
- Online technical data and parametric search
- SPICE models
- Custom electrical curves
- Environmental regulation compliance
- Customer specific screening
- Up-screening capabilities
- Special wafer diffusions
- PbSn plating options
- Package details
- Application notes
- Application and design sample kits
- Custom product and package development

REQUESTING PRODUCT PLATING

1. If requesting Tin/Lead plated devices, add the suffix " TIN/LEAD" to the part number when ordering (example: 2N2222A TIN/LEAD).
2. If requesting Lead (Pb) Free plated devices, add the suffix " PBFREE" to the part number when ordering (example: 2N2222A PBFREE).

CONTACT US

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www.centralsemi.com/wwreps

Worldwide Distributors:
www.centralsemi.com/wwdistributors

http://www.centralsemi.com

Product End of Life Notification

PDN ID:	PDN01015
Notification Date:	12/14/15
Last Buy Date:	6/14/16
Last Shipment Date	12/14/16

Summary:All devices manufactured in the TO-5 package are discontinued and now classified as End of Life (EOL).

Although Central Semiconductor Corp. makes every effort to continue to produce devices that have been proclaimed EOL (End of Life) by various manufacturers, it is an accepted industry practice to discontinue certain devices when customer demand falls below a minimum level of sustainability. Accordingly, the following product(s) have been transitioned to End of Life status as part of Central's Product Management Process. Any replacement product will be noted below. The effective date for placing the last purchase order will be six(6) months from the date of this notice and twelve(12) months from the notice date for final shipments; this may be extended if inventory is available.

Central Part Number	Replacement
ACY18	N/A
ACY20	N/A
BSY32	N/A
CEN1285	N/A
2N1038	N/A
2N1039	N/A
2N1040	N/A
2N1131 TO-5	2N1131
2N1131A T0-5	2N1131A
2N1132 TO-5	2N1132
2N1132 TO-5 W/GOLD	2N1132
2N1175	N/A
2N1191	N/A
2N1194	N/A
2N1301	N/A
2N1302	N/A
2N1303	N/A
2N1304	N/A
2N1305	N/A
2N1306	N/A
2N1307	N/A
2N1308	N/A
2N1309	N/A
2N1310	N/A
2N1311	N/A
2N1373	N/A
2N1377	N/A
2N1499A	N/A
2N1613 TO-5	2N1613
2N2043	N/A
2N2160	N/A
2N2171	N/A
2N2218A TO-5	2N2218A
2N2219 TO-5	2N2219A
2N2219A TO-5	2N2219A
2N2374	N/A
2N2382	N/A
2N2904 TO-5	2N2904A

*** CONTINUED ***

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Product End of Life Notification

PDN ID:	PDN01015
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*** CONTINUED FROM PRIOR PAGE ***

Central Part Number	Replacement
2N2904A TO-5	2N2904A
2N2905 TO-5	2N2905A
2N3019 TO-5	2N3019
2N3053 TO-5	2N3053
2N3133 TO-5	2N3133
2N3467 TO-5	2N3467
2N3725 TO-5	2N3725
2N388A	N/A
2N396A	N/A
2N398A	N/A
2N4033 TO-5	2N4033
2N4036 TO-5	2N4036
2N404	N/A
2N404A	N/A
2N414	N/A
2N446	N/A
2N491B	N/A
2N492	N/A
2N508A	N/A
2N525	N/A
2N526	N/A
2N527	N/A
2N5416 TO-5	N/A
2N650	N/A
2N697 TO-5	N/A
2N699 TO-5	N/A
2SB492	N/A

Central would be happy to assist you by providing additional information or technical data to help locate an alternate source if we have no replacement available. Please email your requests to engineering@centralsemi.com.