

**PNP - 2N6040, 2N6042,
 NPN - 2N6043, 2N6045**

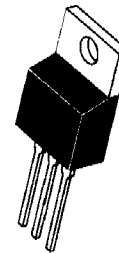
**Plastic Medium-Power
 Complementary Silicon
 Transistors**

Plastic medium-power complementary silicon transistors are designed for general-purpose amplifier and low-speed switching applications.

Features

- High DC Current Gain - $h_{FE} = 2500$ (Typ) @ $I_C = 4.0$ Adc
- Collector-Emitter Sustaining Voltage - @ 100 mAdc -
 $V_{CE(sus)} = 60$ Vdc (Min) - 2N6040, 2N6043
 $= 100$ Vdc (Min) - 2N6042, 2N6045
- Low Collector-Emitter Saturation Voltage -
 $V_{CE(sat)} = 2.0$ Vdc (Max) @ $I_C = 4.0$ Adc - 2N6043,44
 $= 2.0$ Vdc (Max) @ $I_C = 3.0$ Adc - 2N6042, 2N6045
- Monolithic Construction with Built-In Base-Emitter Shunt Resistors
- Epoxy Meets UL 94 V-0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B > 8000 V
 Machine Model, C > 400 V
- Pb-Free Packages are Available*

**DARLINGTON, 8 AMPERES
 COMPLEMENTARY SILICON
 POWER TRANSISTORS
 60 - 100 VOLTS, 75 WATTS**



TO-220AB

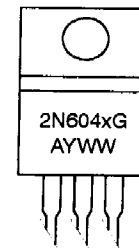
MAXIMUM RATINGS (Note 1)

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	2N6040 2N6043 2N6042 2N6045	V_{CEO} 60 100	Vdc
Collector-Base Voltage	2N6040 2N6043 2N6042 2N6045	V_{CB} 60 100	Vdc
Emitter-Base Voltage		V_{EB} 5.0	Vdc
Collector Current	Continuous Peak	I_C 8.0 16	A dc
Base Current		I_B 120	mAdc
Total Power Dissipation @ $T_C = 25^\circ C$ Derate above $25^\circ C$		P_D 75 0.60	W W/ $^\circ C$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +150	$^\circ C$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. Indicates JEDEC Registered Data.

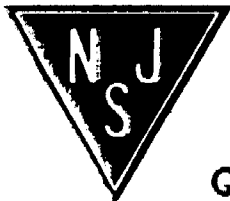
MARKING DIAGRAM



2N604x = Device Code
 x = 0, 2, 3, or 5
 A = Assembly Location
 Y = Year
 WW = Work Week

NJ Semi-Constructors reserves the right to change test conditions, parameters limits and package dimensions without notice information furnished by NJ Semi-Constructors is believed to be both accurate and reliable at the time of going to press. However NJ Semi-Constructors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Constructors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Constructors



PNP – 2N6040, 2N6042, NPN – 2N6043, 2N6045

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Case	θ_{JC}	1.67	$^{\circ}\text{C/W}$
Thermal Resistance, Junction-to-Ambient	θ_{JA}	57	$^{\circ}\text{C/W}$

*ELECTRICAL CHARACTERISTICS ($T_C = 25^{\circ}\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
----------------	--------	-----	-----	------

OFF CHARACTERISTICS

Collector-Emitter Sustaining Voltage ($I_C = 100 \text{ mA}$, $I_B = 0$)	2N6040, 2N6043 2N6042, 2N6045	$V_{CEO(sus)}$	60 100	– –	Vdc
Collector Cutoff Current ($V_{CE} = 60 \text{ Vdc}$, $I_B = 0$) ($V_{CE} = 100 \text{ Vdc}$, $I_B = 0$)	2N6040, 2N6043 2N6042, 2N6045	I_{CEO}	– –	20 20	μA
Collector Cutoff Current ($V_{CE} = 60 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$) ($V_{CE} = 100 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$) ($V_{CE} = 60 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$, $T_C = 150^{\circ}\text{C}$) ($V_{CE} = 80 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$, $T_C = 150^{\circ}\text{C}$) ($V_{CE} = 100 \text{ Vdc}$, $V_{BE(off)} = 1.5 \text{ Vdc}$, $T_C = 150^{\circ}\text{C}$)	2N6040, 2N6043 2N6042, 2N6045 2N6040, 2N6043 2N6041, 2N6044 2N6042, 2N6045	I_{CEX}	– – – – –	20 20 200 200 200	μA
Collector Cutoff Current ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 100 \text{ Vdc}$, $I_E = 0$)	2N6040, 2N6043 2N6042, 2N6045	I_{CBO}	– –	20 20	μA
Emitter Cutoff Current ($V_{BE} = 5.0 \text{ Vdc}$, $I_C = 0$)		I_{EBO}	–	2.0	mAdc

ON CHARACTERISTICS

DC Current Gain ($I_C = 4.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$) ($I_C = 3.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$) ($I_C = 8.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$)	2N6040, 2N6043, 2N6042, 2N6045 All Types	h_{FE}	1000 1000 100	20,000 20,000 –	–
Collector-Emitter Saturation Voltage ($I_C = 4.0 \text{ Adc}$, $I_B = 16 \text{ mA}$) ($I_C = 3.0 \text{ Adc}$, $I_B = 12 \text{ mA}$) ($I_C = 8.0 \text{ Adc}$, $I_B = 80 \text{ Adc}$)	2N6040, 2N6043, 2N6042, 2N6045 All Types	$V_{CE(sat)}$	– – –	2.0 2.0 4.0	Vdc
Base-Emitter Saturation Voltage ($I_C = 8.0 \text{ Adc}$, $I_B = 80 \text{ mA}$)		$V_{BE(sat)}$	–	4.5	Vdc
Base-Emitter On Voltage ($I_C = 4.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$)		$V_{BE(on)}$	–	2.8	Vdc

DYNAMIC CHARACTERISTICS

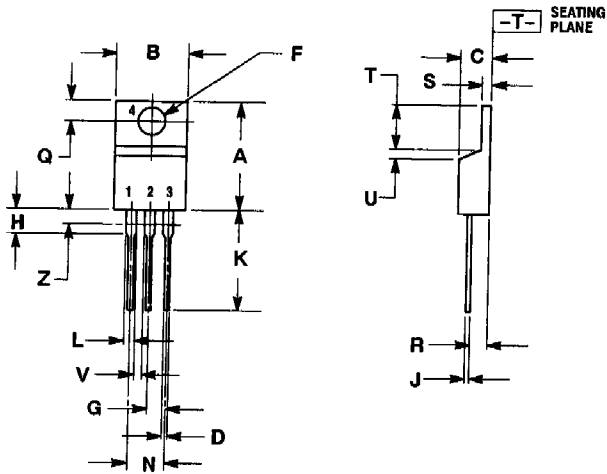
Small Signal Current Gain ($I_C = 3.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$, $f = 1.0 \text{ MHz}$)		$ h_{fe} $	4.0	–	
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 0.1 \text{ MHz}$)	2N6040/2N6042 2N6043/2N6045	C_{ob}	– –	300 200	pF
Small-Signal Current Gain ($I_C = 3.0 \text{ Adc}$, $V_{CE} = 4.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)		h_{fe}	300	–	–

*Indicates JEDEC Registered Data.

PNP - 2N6040, 2N6042, NPN - 2N6043, 2N6045

PACKAGE DIMENSIONS

TO-220



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.036	0.64	0.91
F	0.142	0.161	3.61	4.09
G	0.095	0.105	2.42	2.66
H	0.110	0.161	2.80	4.10
J	0.014	0.025	0.36	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.78
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

STYLE 1:

- PIN 1: BASE
 2. COLLECTOR
 3. EMITTER
 4. COLLECTOR