

# NJD2873T4

## Plastic Power Transistors

### NPN Silicon DPAK For Surface Mount Applications

Designed for high-gain audio amplifier applications.

#### Features

- Pb-Free Package is Available
- High DC Current Gain –  
 $h_{FE} = 120$  (Min) @  $I_C = 500$  mA  
= 40 (Min) @  $I_C = 2$  A
- Low Collector-Emitter Saturation Voltage –  
 $V_{CE(sat)} = 0.3$  Vdc (Max) @  $I_C = 1$  A
- High Current-Gain – Bandwidth Product –  
 $f_T = 65$  MHz (Min) @  $I_C = 100$  mA
- Epoxy Meets UL 94 V-0 @ 0.125 in
- ESD Ratings: Human Body Model, 3B > 8000 V  
Machine Model, C > 400 V

#### MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Base Voltage	$V_{CB}$	50	Vdc
Collector-Emitter Voltage	$V_{CEO}$	50	Vdc
Emitter-Base Voltage	$V_{EB}$	5	Vdc
Collector Current Continuous Peak	$I_C$	2 3	Adc
Base Current	$I_B$	0.4	Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	15 0.1	W W/ $^\circ\text{C}$
Total Device Dissipation @ $T_A = 25^\circ\text{C}^*$ Derate above $25^\circ\text{C}$	$P_D$	1.68 0.011	W W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J$ , $T_{stg}$	-65 to +175	$^\circ\text{C}$

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.

#### THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance Junction-to-Case Junction-to-Ambient*	$R_{\theta JC}$ $R_{\theta JA}$	10 89.3	$^\circ\text{C/W}$

\*These ratings are applicable when surface mounted on the minimum pad sizes recommended.



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**SILICON  
POWER TRANSISTORS  
2 AMPERES  
50 VOLTS  
15 WATTS**

#### MARKING DIAGRAM



Y = Year  
WW = Work Week  
G = Pb-Free Device

#### ORDERING INFORMATION

Device	Package	Shipping <sup>†</sup>
NJD2873	DPAK	75 Units / Rail
NJD2873G	DPAK (Pb-Free)	75 Units / Rail
NJD2873RL	DPAK	1800 Units / Reel
NJD2873RLG	DPAK (Pb-Free)	1800 Units / Reel
NJD2873T4	DPAK	2500 Units / Reel
NJD2873T4G	DPAK (Pb-Free)	2500 Units / Reel

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector–Emitter Sustaining Voltage (Note 1) ( $I_C = 10 \text{ mA}_\text{dc}$ , $I_B = 0$ )	$V_{\text{CEO}(\text{sus})}$	50	—	Vdc
Collector Cutoff Current ( $V_{\text{CB}} = 50 \text{ Vdc}$ , $I_E = 0$ )	$I_{\text{CBO}}$	—	100	$\text{nA}_\text{dc}$
Emitter Cutoff Current ( $V_{\text{BE}} = 5 \text{ Vdc}$ , $I_C = 0$ )	$I_{\text{EBO}}$	—	100	$\text{nA}_\text{dc}$
<b>ON CHARACTERISTICS</b>				
DC Current Gain (Note 1) ( $I_C = 0.5 \text{ A}$ , $V_{\text{CE}} = 2 \text{ V}$ ) ( $I_C = 2 \text{ Adc}$ , $V_{\text{CE}} = 2 \text{ Vdc}$ ) ( $I_C = 0.75 \text{ Adc}$ , $V_{\text{CE}} = 1.6 \text{ Vdc}$ , $-40^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$ )	$h_{\text{FE}}$	120 40 80	360 — 360	—
Collector–Emitter Saturation Voltage (Note 1) ( $I_C = 1 \text{ A}$ , $I_B = 0.05 \text{ A}$ )	$V_{\text{CE}(\text{sat})}$	—	0.3	Vdc
Base–Emitter Saturation Voltage (Note 1) ( $I_C = 1 \text{ A}$ , $I_B = 0.05 \text{ Adc}$ )	$V_{\text{BE}(\text{sat})}$	—	1.2	Vdc
Base–Emitter On Voltage (Note 1) ( $I_C = 1 \text{ Adc}$ , $V_{\text{CE}} = 2 \text{ Vdc}$ ) ( $I_C = 0.75 \text{ Adc}$ , $V_{\text{CE}} = 1.6 \text{ Vdc}$ , $-40^\circ\text{C} \leq T_J \leq 150^\circ\text{C}$ )	$V_{\text{BE}(\text{on})}$	— —	1.2 0.95	Vdc
<b>DYNAMIC CHARACTERISTICS</b>				
Current–Gain – Bandwidth Product (Note 2) ( $I_C = 100 \text{ mA}_\text{dc}$ , $V_{\text{CE}} = 10 \text{ Vdc}$ , $f_{\text{test}} = 10 \text{ MHz}$ )	$f_T$	65	—	MHz
Output Capacitance ( $V_{\text{CB}} = 10 \text{ Vdc}$ , $I_E = 0$ , $f = 0.1 \text{ MHz}$ )	$C_{\text{ob}}$	—	80	pF

1. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\approx 2\%$ .

2.  $f_T = |h_{\text{fe}}| \cdot f_{\text{test}}$ .

TYPICAL CHARACTERISTICS

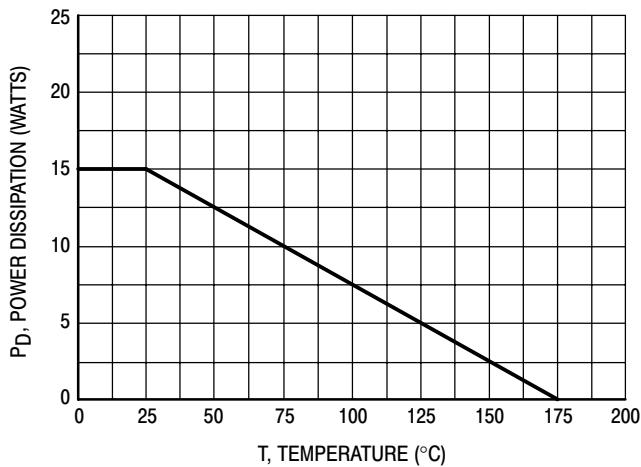


Figure 1. Power Derating

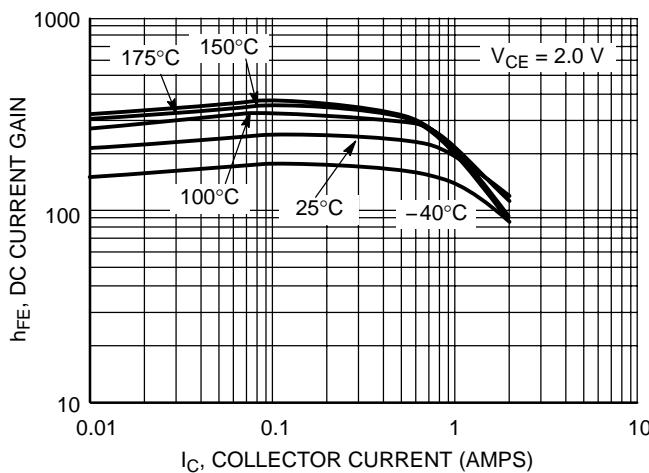


Figure 2. DC Current Gain

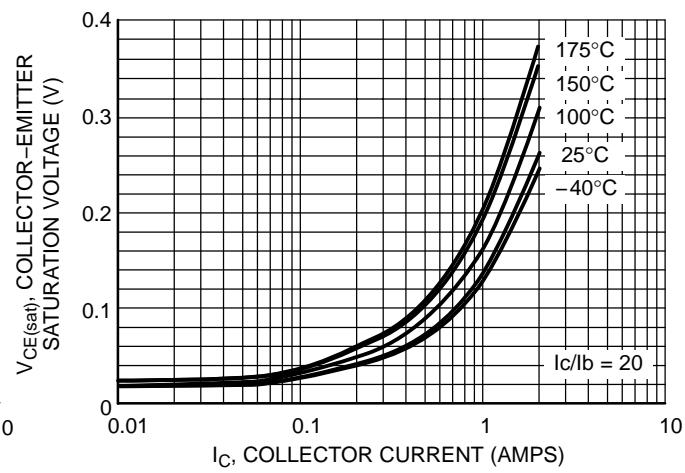


Figure 3. Collector-Emitter Saturation Voltage

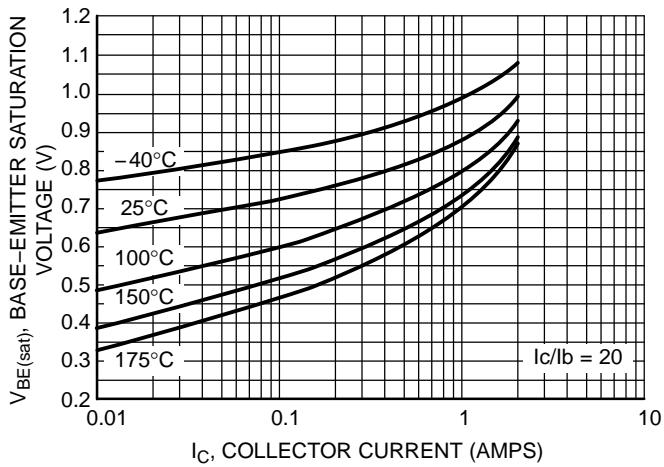


Figure 4. Base-Emitter Saturation Voltage

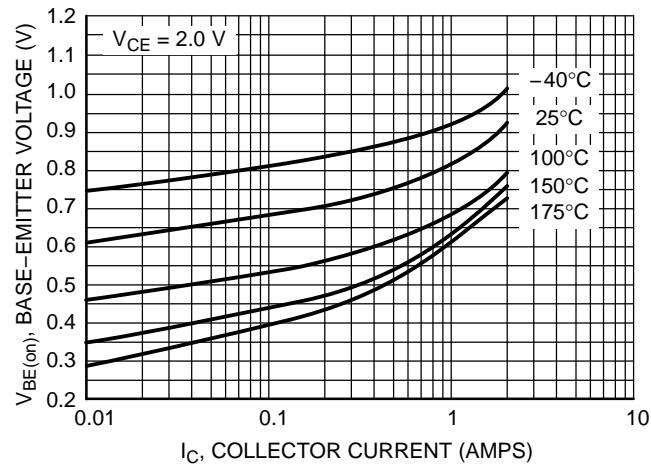


Figure 5. Base-Emitter Voltage

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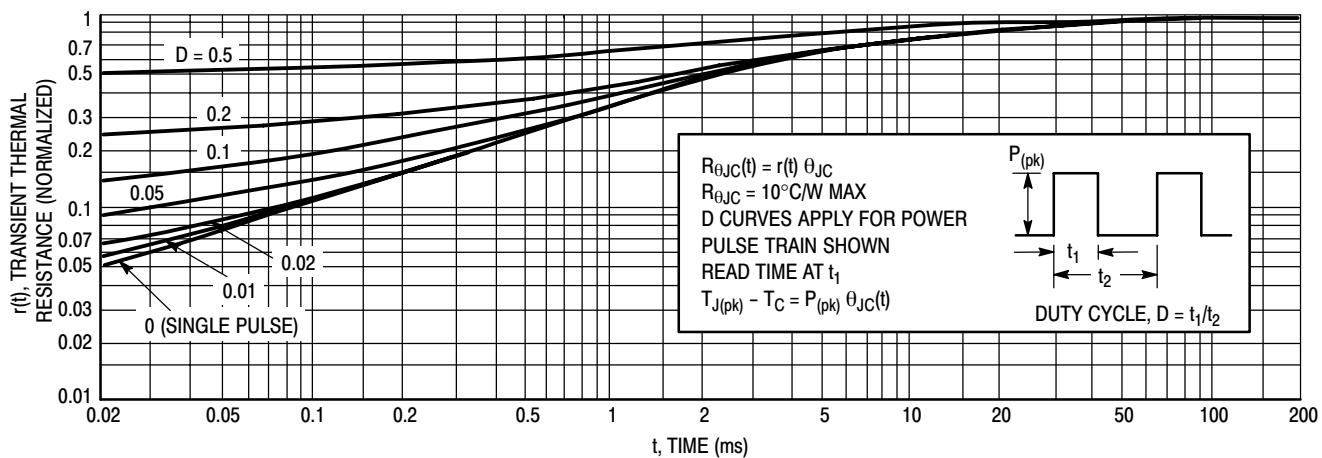
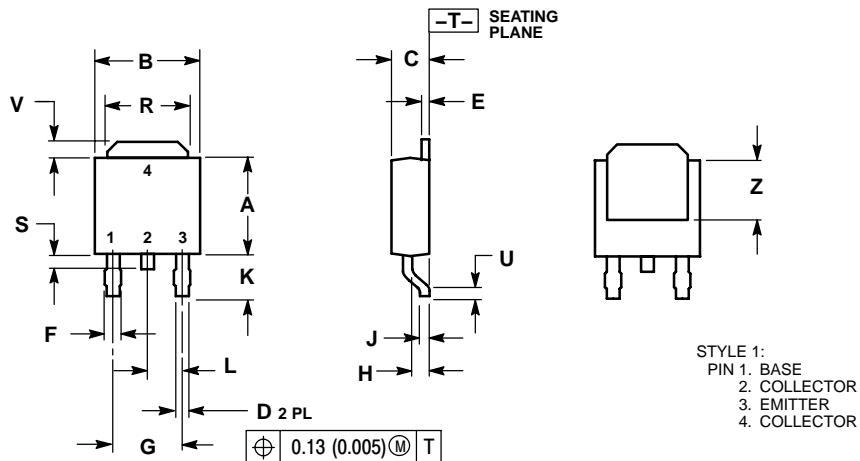


Figure 6. Thermal Response

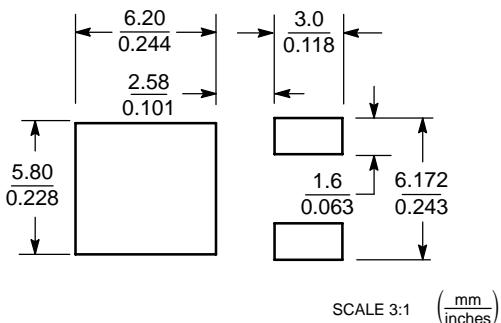
## PACKAGE DIMENSIONS

DPAK  
CASE 369C-01  
ISSUE O

NOTES:  
1. DIMENSIONING AND TOLERANCING  
PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.245	5.97	6.22
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.180	0.215	4.57	5.45
S	0.025	0.040	0.63	1.01
U	0.020	---	0.51	---
V	0.035	0.050	0.89	1.27
Z	0.155	---	3.93	---

## SOLDERING FOOTPRINT\*



\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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