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Kind regards,

Team Nexperia



NXP3875Y; NXP3875G

50 V, 150 mA NPN general-purpose transistors
Rev. 1 — 12 December 2012

Product data sheet

Product profile

1.1 General description

NPN general-purpose transistors in a small SOT23 (TO-236AB) Surface-Mounted Device (SMD) plastic package.

1.2 Features and benefits

- General-purpose transistors
- Small SMD plastic packages
- Two different current gain selections
- AEC-Q101 qualified

1.3 Applications

General-purpose switching and amplification

1.4 Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
V_{CEO}	collector-emitter voltage	open base	-	-	50	V
I _C	collector current		-	-	150	mΑ
h _{FE}	DC current gain	$V_{CE} = 6 \text{ V}; I_{C} = 2 \text{ mA}$				
	NXP3875Y		120	-	240	
	NXP3875G		200	-	400	

Pinning information 2.

Table 2. **Pinning**

Table 2.	- I IIIIIIII		
Pin	Description	Simplified outline	Graphic symbol
1	base		•
2	emitter	3	3
3	collector		1—
		1 2	'`
			2
			sym021



3. Ordering information

Table 3. Ordering information

Type number	Package				
	Name	Description	Version		
NXP3875Y	TO-236AB	plastic surface-mounted package; 3 leads	SOT23		
NXP3875G					

4. Marking

Table 4. Marking codes

Type number	Marking code ^[1]
NXP3875Y	*JE
NXP3875G	*JF

^{[1] * =} placeholder for manufacturing site code.

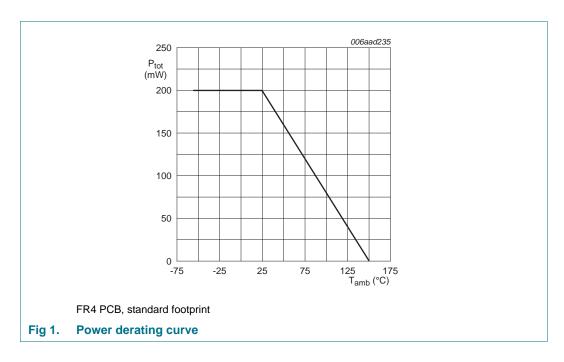
5. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V_{CBO}	collector-base voltage	open emitter	-	60	V
V_{CEO}	collector-emitter voltage	open base	-	50	V
V_{EBO}	emitter-base voltage	open collector	-	5	V
I _C	collector current		-	150	mA
I _{CM}	peak collector current	single pulse; $t_p \le 1 \text{ ms}$	-	200	mA
I _B	base current			30	mA
I _{BM}	peak base current	single pulse; $t_p \le 1 \text{ ms}$	-	100	mA
P _{tot}	total power dissipation	$T_{amb} \le 25 ^{\circ}C$	<u>[1]</u> -	200	mW
Tj	junction temperature		-	150	°C
T _{amb}	ambient temperature		-65	+150	°C
T _{stg}	storage temperature		-65	+150	°C

^[1] Device mounted on an FR4 Printed-Circuit Board (PCB), single-sided copper, tin-plated and standard footprint.

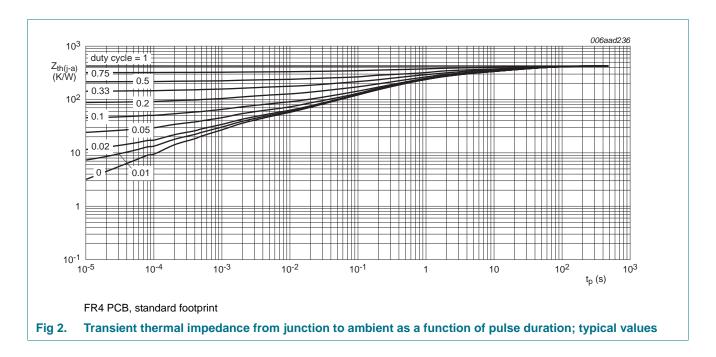


6. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Min	Тур	Max	Unit
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1] -	-	625	K/W

[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

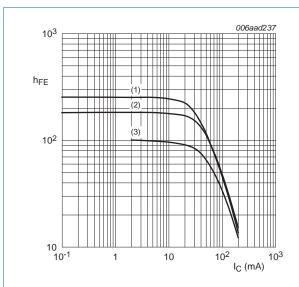


7. Characteristics

Table 7. Characteristics

 $T_{amb} = 25$ °C unless otherwise specified.

arrio						
Symbol	Parameter	Conditions	Min	Тур	Max	Unit
I _{CBO}	collector-base	$V_{CB} = 60 \text{ V}; I_{E} = 0 \text{ A}$	-	-	100	nA
	cut-off current	$V_{CB} = 60 \text{ V}; I_E = 0 \text{ A};$ $T_j = 150 \text{ °C}$	-	-	5	μΑ
I _{EBO}	emitter-base cut-off current	$V_{EB} = 5 \text{ V}; I_{C} = 0 \text{ A}$	-	-	100	nA
h _{FE}	DC current gain	$V_{CE} = 6 \text{ V}; I_{C} = 2 \text{ mA}$				
	NXP3875Y		120	-	240	
	NXP3875G		200	-	400	
V _{CEsat}	collector-emitter saturation voltage	$I_C = 100 \text{ mA}; I_B = 10 \text{ mA}$	-	-	250	mV
V_{BEsat}	base-emitter saturation voltage	$I_C = 100 \text{ mA}; I_B = 10 \text{ mA}$	-	-	1	V
f _T	transition frequency	$V_{CE} = 10 \text{ V; } I_{C} = 1 \text{ mA;}$ f = 100 MHz	80	-	-	MHz
C _c	collector capacitance	$V_{CB} = 10 \text{ V}; I_E = i_e = 0 \text{ A};$ f = 1 MHz	-	-	3.5	pF
NF	noise figure	$I_C = 0.1 \text{ mA}; V_{CE} = 6 \text{ V};$ $R_S = 10 \text{ k}\Omega; f = 1 \text{ kHz};$	-	-	10	dB

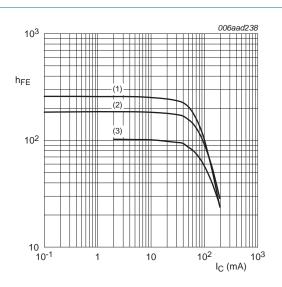


(1)
$$T_{amb} = 100 \, ^{\circ}C$$

(2)
$$T_{amb} = 25 \, ^{\circ}C$$

(3) $T_{amb} = -55 \, ^{\circ}C$

Fig 3. NXP3875Y: DC current gain as a function of collector current; typical values



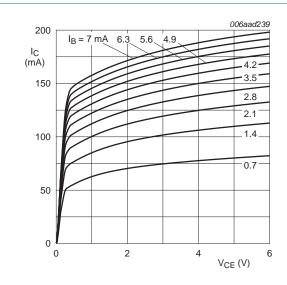
$$V_{CE} = 6 V$$

(1)
$$T_{amb} = 100 \, ^{\circ}C$$

(2)
$$T_{amb} = 25 \, ^{\circ}C$$

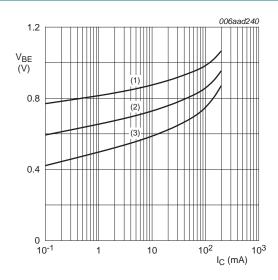
(3)
$$T_{amb} = -55 \, ^{\circ}C$$

Fig 4. NXP3875Y: DC current gain as a function of collector current; typical values



T_{amb} = 25 °C

Fig 5. NXP3875Y: Collector current as a function of collector-emmiter voltage; typical values



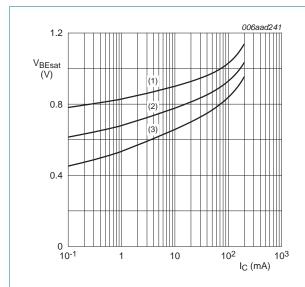
 $V_{CE} = 6 V$

(1)
$$T_{amb} = -55 \, ^{\circ}C$$

(2) $T_{amb} = 25 \, ^{\circ}C$

(3) $T_{amb} = 100 \, ^{\circ}C$

Fig 6. NXP3875Y: Base-emmiter voltage as a function of collector current; typical values



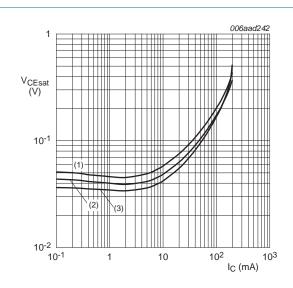
$$I_{\rm C}/I_{\rm B} = 10$$

(1)
$$T_{amb} = -55 \, ^{\circ}C$$

(2)
$$T_{amb} = 25 \, ^{\circ}C$$

(3) $T_{amb} = 100 \, ^{\circ}C$

Fig 7. NXP3875Y: Base-emitter saturation voltage as a function of collector currant; typical values



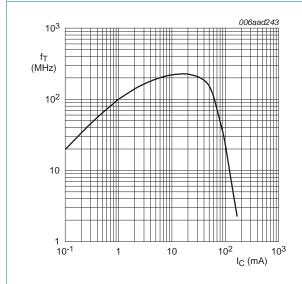
$$I_{\rm C}/I_{\rm B} = 10$$

(1)
$$T_{amb} = 100 \, ^{\circ}C$$

(2)
$$T_{amb} = 25 \, ^{\circ}C$$

(3)
$$T_{amb} = -55 \, ^{\circ}C$$

Fig 8. NXP3875Y: Collector-emmiter saturation voltage as a function of collector current; typical values



 V_{CE} = 10 V; T_{amb} = 25 °C

NXP3875Y: Transition frequency as a function

of collector current; typical values

$$V_{CE} = 1 V$$

(1)
$$T_{amb} = 100 \, ^{\circ}C$$

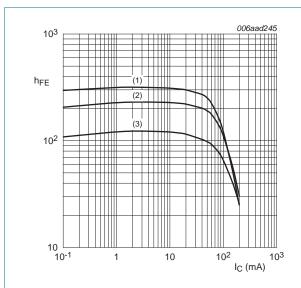
(2)
$$T_{amb} = 25 \, ^{\circ}C$$

(3)
$$T_{amb} = -55 \, ^{\circ}C$$

Fig 10. NXP3875G: DC current gain as a function of collector current; typical values

NXP3875Y NXP3875G

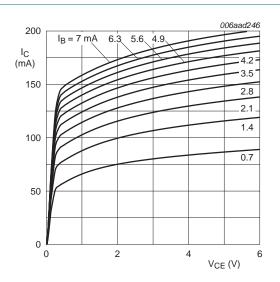
Fig 9.



 $V_{CE} = 6 V$

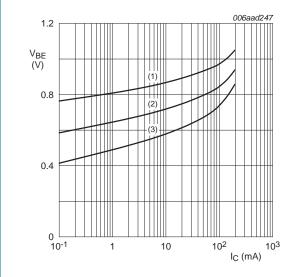
- (1) $T_{amb} = 100 \, ^{\circ}C$
- (2) $T_{amb} = 25 \, ^{\circ}C$
- (3) $T_{amb} = -55 \, ^{\circ}C$

Fig 11. NXP3875G: DC current gain as a function of collector current; typical values



T_{amb} = 25 °C

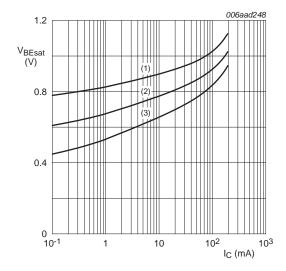
Fig 12. NXP3875G: Collector current as a function of collector-emmiter voltage; typical values



 $V_{CE} = 6 V$

- (1) $T_{amb} = -55 \, ^{\circ}C$
- (2) T_{amb} = 25 °C
- (3) $T_{amb} = 100 \, ^{\circ}C$

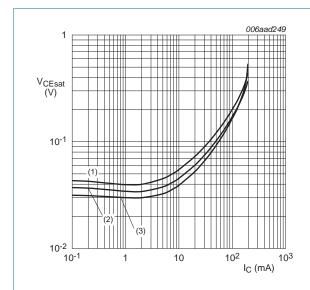
Fig 13. NXP3875G: Base-emmiter voltage as a function of collector current; typical values



 $I_{\rm C}/I_{\rm B} = 10$

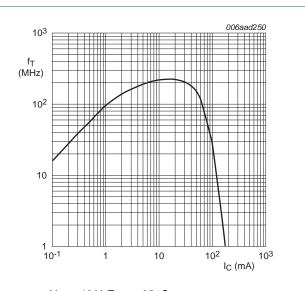
- (1) $T_{amb} = -55 \, ^{\circ}C$
- (2) $T_{amb} = 25 \, ^{\circ}C$
- (3) $T_{amb} = 100 \, ^{\circ}C$

Fig 14. NXP3875G: Base-emitter saturation voltage as a function of collector currant; typical values



- $I_{\rm C}/I_{\rm B} = 10$
- (1) $T_{amb} = 100 \, ^{\circ}C$
- (2) $T_{amb} = 25 \, ^{\circ}C$
- (3) $T_{amb} = -55 \, ^{\circ}C$

Fig 15. NXP3875G: Collector-emmiter saturation voltage as a function of collector current; typical values



 V_{CE} = 10 V; T_{amb} = 25 °C

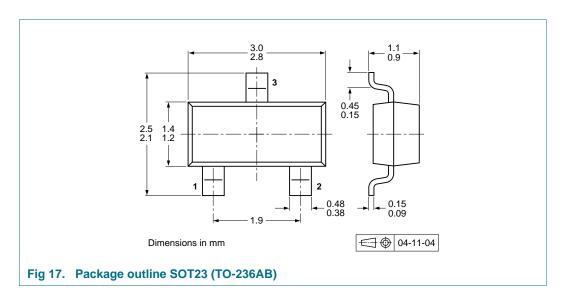
Fig 16. NXP3875G: Transition frequency as a function of collector current; typical values

8. Test information

8.1 Quality information

This product has been qualified in accordance with the Automotive Electronics Council (AEC) standard *Q101 - Stress test qualification for discrete semiconductors*, and is suitable for use in automotive applications.

9. Package outline



10. Packing information

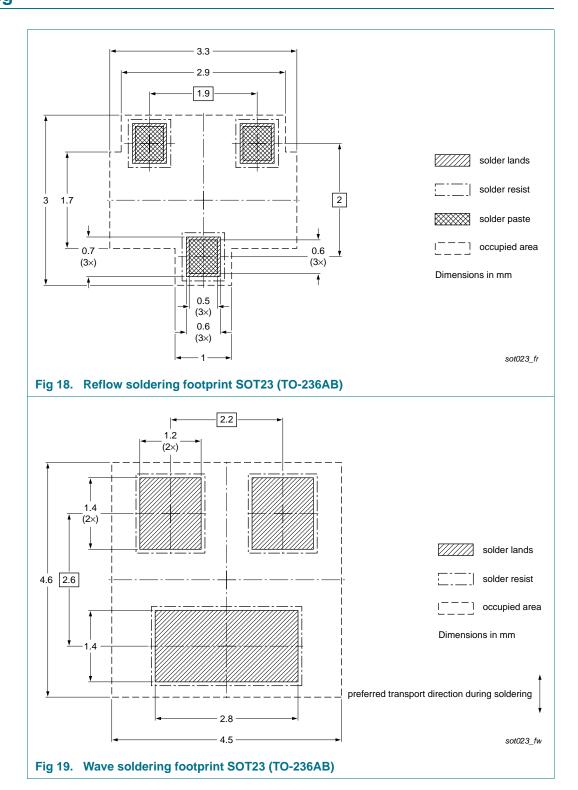
Table 8. Packing methods

The indicated -xxx are the last three digits of the 12NC ordering code.[1]

Туре	Package	Description	Packing quantity	
number			1000	4000
NXP3875Y	SOT23	4 mm pitch, 8 mm tape and reel	-215	-235
NXP3875G				

^[1] For further information and the availability of packing methods, see $\underline{\text{Section 14}}$.

11. Soldering



12. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
NXP3875Y_NXP3875G v.1	20121212	Product data sheet	-	-

13. Legal information

13.1 Data sheet status

Document status[1][2]	Product status[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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NXP3875Y_NXP3875G

NXP3875Y; NXP3875G

50 V, 150 mA NPN general-purpose transistors

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