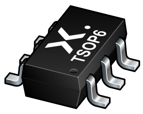


NMB2227A

40 V, 600 mA NPN/PNP general-purpose transistors

12 November 2025 Product data sheet

1. General description

NPN/PNP general-purpose transistors in a small SOT457 (SC-74) Surface-Mounted Device (SMD) plastic package.

2. Features and benefits

- General-purpose transistor
- High current
- Reduces component count on Printed-Circuit Board (PCB)
- Reduces pick and place costs
- AEC-Q101 qualified

3. Applications

- General-purpose switching and amplification
- Complementary driver
- Half-bridge and full-bridge driver

4. Quick reference data

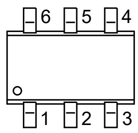
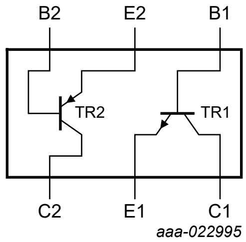
Table 1. Quick reference data

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
TR1 (NPN)							
V_{CEO}	collector-emitter voltage	open base		-	-	40	V
h_{FE}	DC current gain	V_{CE} = 10 V; I_C = 150 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		100	-	300	
TR2 (PNP)							
V_{CEO}	collector-emitter voltage	open base		-	-	-60	V
h_{FE}	DC current gain	V_{CE} = -10 V; I_C = -150 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		100	-	300	
Per transistor; for the PNP transistor with negative polarity							
I_C	collector current			-	-	600	mA

nexperia

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	C2	collector TR2	 **TSOP6 (SOT457)**	
2	E1	emitter TR1		
3	C1	collector TR1		
4	B1	base TR1		
5	E2	emitter TR2		
6	B2	base TR2		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
NMB2227A	TSOP6	plastic, surface-mounted package (SC-74; TSOP6); 6 leads	SOT457

7. Marking

Table 4. Marking codes

Type number	Marking code
NMB2227A	3B

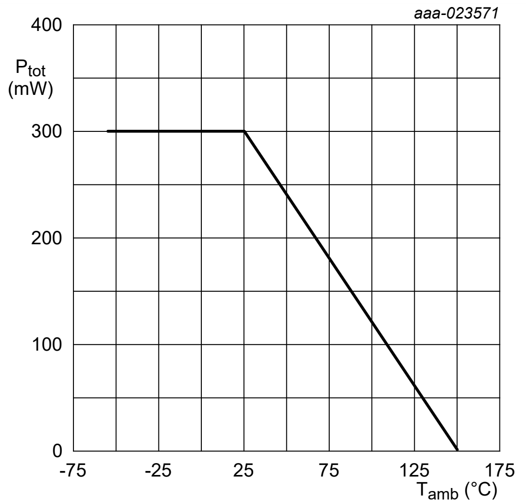
8. Limiting values

Table 5. Limiting values

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

Symbol	Parameter	Conditions		Min	Max	Unit
TR1 (NPN)						
V_{CBO}	collector-base voltage	open emitter		-	75	V
V_{CEO}	collector-emitter voltage	open base		-	40	V
TR2 (PNP)						
V_{CBO}	collector-base voltage	open emitter		-	-60	V
V_{CEO}	collector-emitter voltage	open base		-	-60	V
Per transistor; for the PNP transistor with negative polarity						
V_{EBO}	emitter-base voltage	open collector		-	6	V
I_C	collector current			-	600	mA
I_{CM}	peak collector current	single pulse; $t_p \leq$ 1 ms		-	800	mA
I_{BM}	peak base current			-	200	mA
P_{tot}	total power dissipation	$T_{amb} \leq$ 25 °C	[1]	-	200	mW
Per device						
P_{tot}	total power dissipation	$T_{amb} \leq$ 25 °C	[1]	-	300	mW
T_j	junction temperature			-	150	°C
T_{amb}	ambient temperature			-55	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.



FR4 PCB; standard footprint

Fig. 1. Power derating curve

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Per transistor							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	625	K/W
Per device							
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air	[1]	-	-	417	K/W

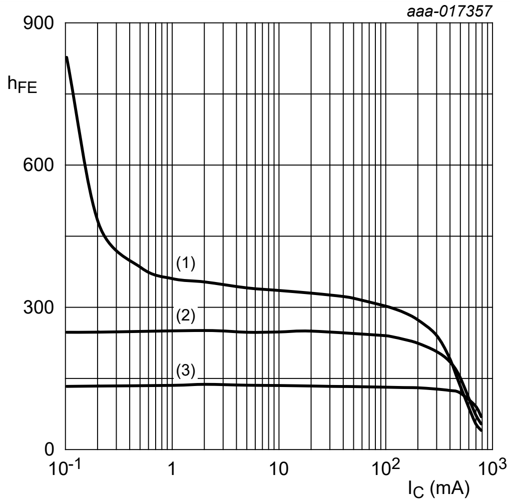
[1] Device mounted on an FR4 PCB, single-sided copper, tin-plated and standard footprint.

10. Characteristics

Table 7. Characteristics

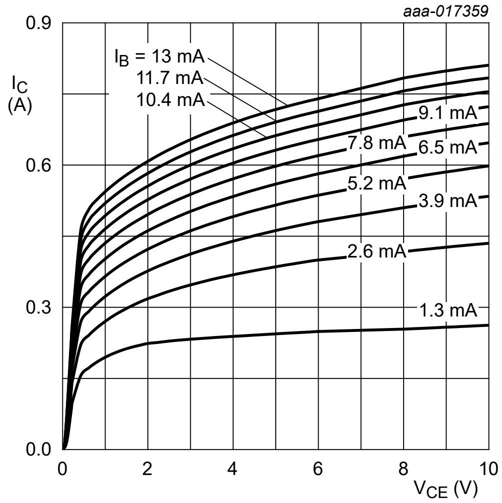
Symbol	Parameter	Conditions		Min	Typ	Max	Unit
TR1 (NPN)							
I_{CBO}	collector-base cut-off current	V_{CB} = 60 V; I_E = 0 A; T_{amb} = 25 °C		-	-	10	nA
		V_{CB} = 60 V; I_E = 0 A; T_j = 125 °C		-	-	10	μA
I_{EBO}	emitter-base cut-off current	V_{EB} = 5 V; I_C = 0 A; T_{amb} = 25 °C		-	-	10	nA
h_{FE}	DC current gain	V_{CE} = 10 V; I_C = 1 mA; T_{amb} = 25 °C		50	-	-	
		V_{CE} = 10 V; I_C = 10 mA; T_{amb} = 25 °C		75	-	-	
		V_{CE} = 10 V; I_C = 150 mA; pulsed; t_p ≤ 300 μs; δ ≤ 0.02; T_{amb} = 25 °C		100	-	300	
		V_{CE} = 10 V; I_C = 500 mA; pulsed; t_p ≤ 300 μs; δ ≤ 0.02; T_{amb} = 25 °C		40	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = 150 mA; I_B = 15 mA; pulsed; t_p ≤ 300 μs; δ ≤ 0.02; T_{amb} = 25 °C		-	-	300	mV
		I_C = 500 mA; I_B = 50 mA; pulsed; t_p ≤ 300 μs; δ ≤ 0.02; T_{amb} = 25 °C		-	-	1	V
V_{BEsat}	base-emitter saturation voltage	I_C = 150 mA; I_B = 15 mA; pulsed; t_p ≤ 300 μs; δ ≤ 0.02; T_{amb} = 25 °C		0.6	-	1.2	V
		I_C = 500 mA; I_B = 50 mA; pulsed; t_p ≤ 300 μs; δ ≤ 0.02; T_{amb} = 25 °C		-	-	2	V
t_d	delay time	I_C = 150 mA; I_{Bon} = 15 mA; I_{Boff} = -15 mA; V_{CC} = 10 V; T_{amb} = 25 °C		-	-	15	ns
t_r	rise time			-	-	20	ns
t_{on}	turn-on time			-	-	35	ns
t_s	storage time			-	-	200	ns
t_f	fall time			-	-	60	ns
t_{off}	turn-off time			-	-	250	ns
C_c	collector capacitance	V_{CB} = 10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	8	pF
C_e	emitter capacitance	V_{EB} = 500 mV; I_C = 0 A; i_c = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	25	pF
f_T	transition frequency	V_{CE} = 20 V; I_C = 20 mA; f = 100 MHz; T_{amb} = 25 °C		300	-	-	MHz

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
TR2 (PNP)							
I_{CBO}	collector-base cut-off current	V_{CB} = -50 V; I_E = 0 A; T_{amb} = 25 °C		-	-	-10	nA
		V_{CB} = -50 V; I_E = 0 A; T_j = 125 °C		-	-	-10	µA
I_{EBO}	emitter-base cut-off current	V_{EB} = -5 V; I_C = 0 A; T_{amb} = 25 °C		-	-	-50	nA
h_{FE}	DC current gain	V_{CE} = -10 V; I_C = -0.1 mA; T_{amb} = 25 °C		75	-	-	
		V_{CE} = -10 V; I_C = -1 mA; T_{amb} = 25 °C		100	-	-	
		V_{CE} = -10 V; I_C = -10 mA; T_{amb} = 25 °C		100	-	-	
		V_{CE} = -10 V; I_C = -150 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		100	-	300	
		V_{CE} = -10 V; I_C = -500 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		50	-	-	
V_{CEsat}	collector-emitter saturation voltage	I_C = -150 mA; I_B = -15 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		-	-	-400	mV
		I_C = -500 mA; I_B = -50 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		-	-	-1.6	V
V_{BEsat}	base-emitter saturation voltage	I_C = -150 mA; I_B = -15 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		-	-	-1.3	V
		I_C = -500 mA; I_B = -50 mA; pulsed; t_p ≤ 300 µs; δ ≤ 0.02; T_{amb} = 25 °C		-	-	-2.6	V
t_d	delay time	I_C = -150 mA; I_{Bon} = -15 mA; I_{Boff} = 15 mA; V_{CC} = -10 V; T_{amb} = 25 °C		-	-	12	ns
t_r	rise time			-	-	30	ns
t_{on}	turn-on time			-	-	40	ns
t_s	storage time			-	-	300	ns
t_f	fall time			-	-	65	ns
t_{off}	turn-off time			-	-	365	ns
C_c	collector capacitance	V_{CB} = -10 V; I_E = 0 A; i_e = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	8	pF
C_e	emitter capacitance	V_{EB} = -2 V; I_C = 0 A; i_c = 0 A; f = 1 MHz; T_{amb} = 25 °C		-	-	30	pF
f_T	transition frequency	V_{CE} = -20 V; I_C = -50 mA; f = 100 MHz; T_{amb} = 25 °C		200	-	-	MHz



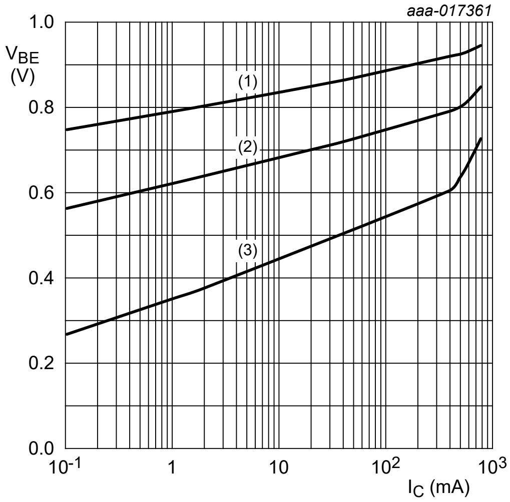
V_{CE} = 10 V
(1) T_{amb} = 100 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

Fig. 2. NPN transistor: DC current gain as a function of collector current; typical values



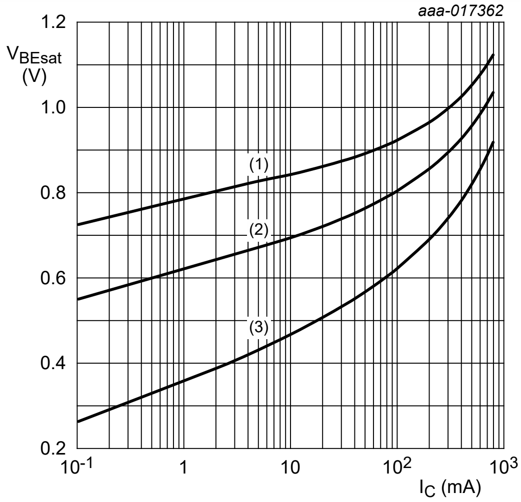
T_{amb} = 25 °C

Fig. 3. NPN transistor: Collector current as a function of collector-emitter voltage; typical values



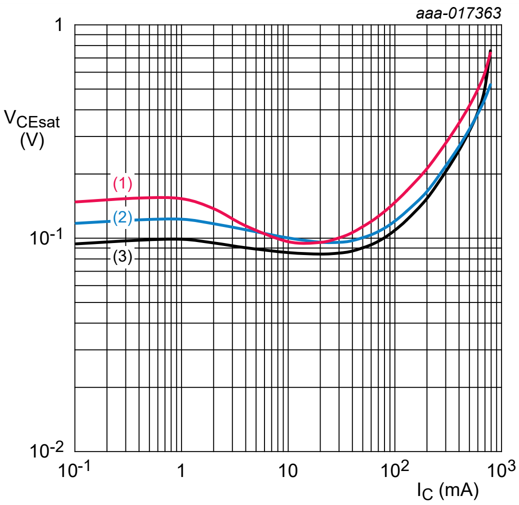
V_{CE} = 10 V
(1) T_{amb} = −55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 4. NPN transistor: Base-emitter voltage as a function of collector current; typical values



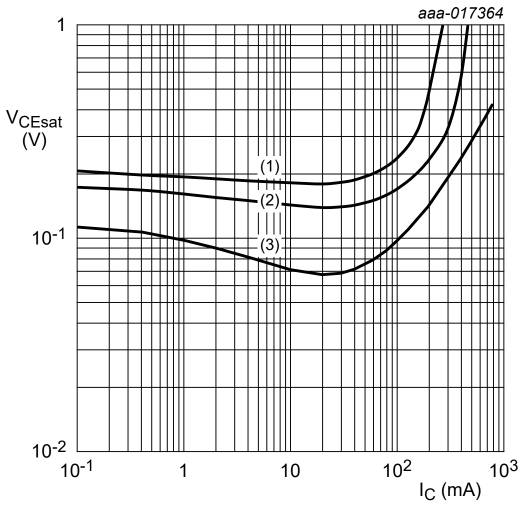
I_C/I_B = 10
(1) T_{amb} = −55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 5. NPN transistor: Base-emitter saturation voltage as a function of collector current; typical values



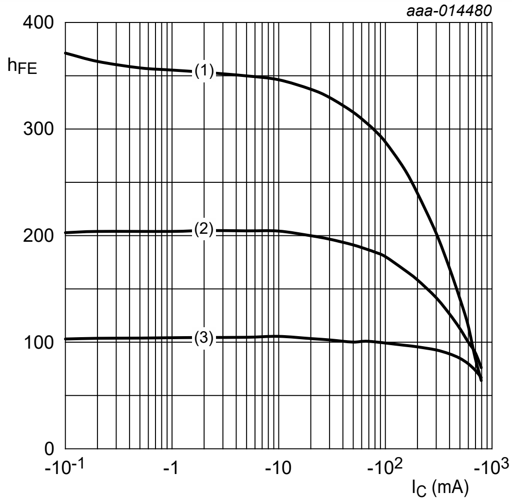
I_C/I_B = 20
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

Fig. 6. NPN transistor: Collector-emitter saturation voltage as a function of collector current; typical values



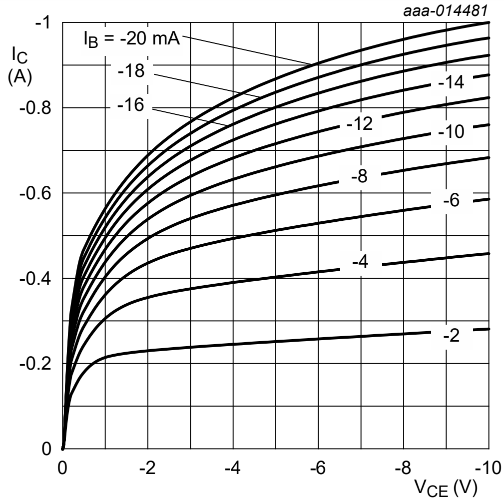
T_{amb} = 25 °C
(1) I_C/I_B = 100
(2) I_C/I_B = 50
(3) I_C/I_B = 10

Fig. 7. NPN transistor: Collector-emitter saturation voltage as a function of collector current; typical values



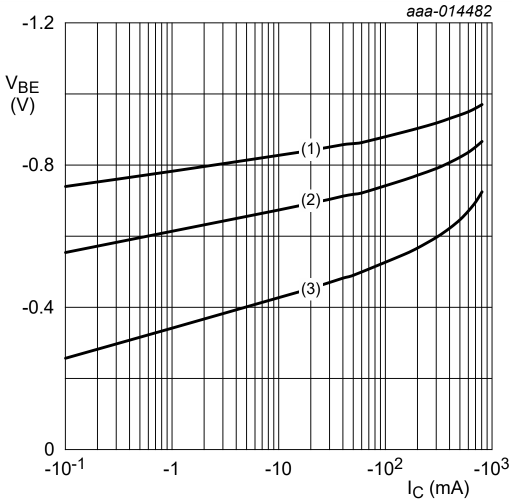
V_{CE} = -10 V
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

Fig. 8. PNP transistor: DC current gain as a function of collector current; typical values



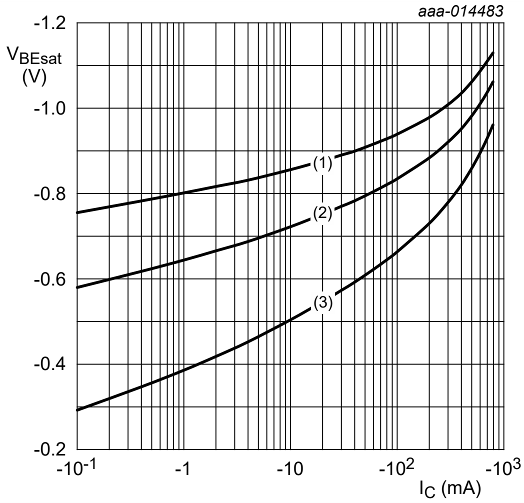
T_{amb} = 25 °C

Fig. 9. PNP transistor: Collector current as a function of collector-emitter voltage; typical values



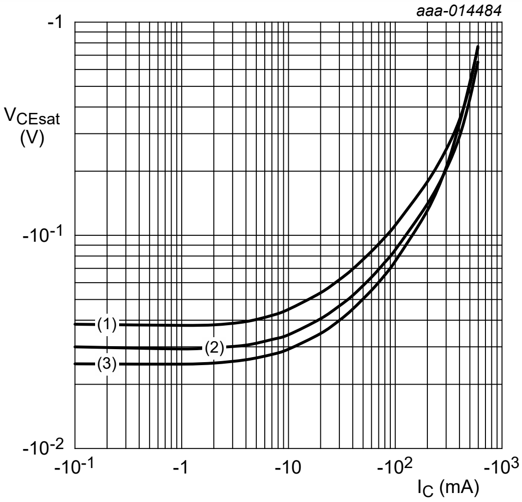
V_{CE} = -10 V
(1) T_{amb} = −55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 10. PNP transistor: Base-emitter voltage as a function of collector current; typical values



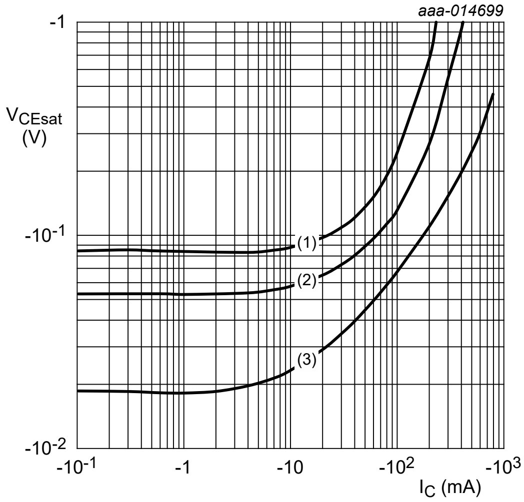
I_C/I_B = 10
(1) T_{amb} = −55 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = 150 °C

Fig. 11. PNP transistor: Base-emitter saturation voltage as a function of collector current; typical values



I_C/I_B = 20
(1) T_{amb} = 150 °C
(2) T_{amb} = 25 °C
(3) T_{amb} = −55 °C

Fig. 12. PNP transistor: Collector-emitter saturation voltage as a function of collector current; typical values



T_{amb} = 25 °C
(1) I_C/I_B = 100
(2) I_C/I_B = 50
(3) I_C/I_B = 10

Fig. 13. PNP transistor: Collector-emitter saturation voltage as a function of collector current; typical values

11. Test information

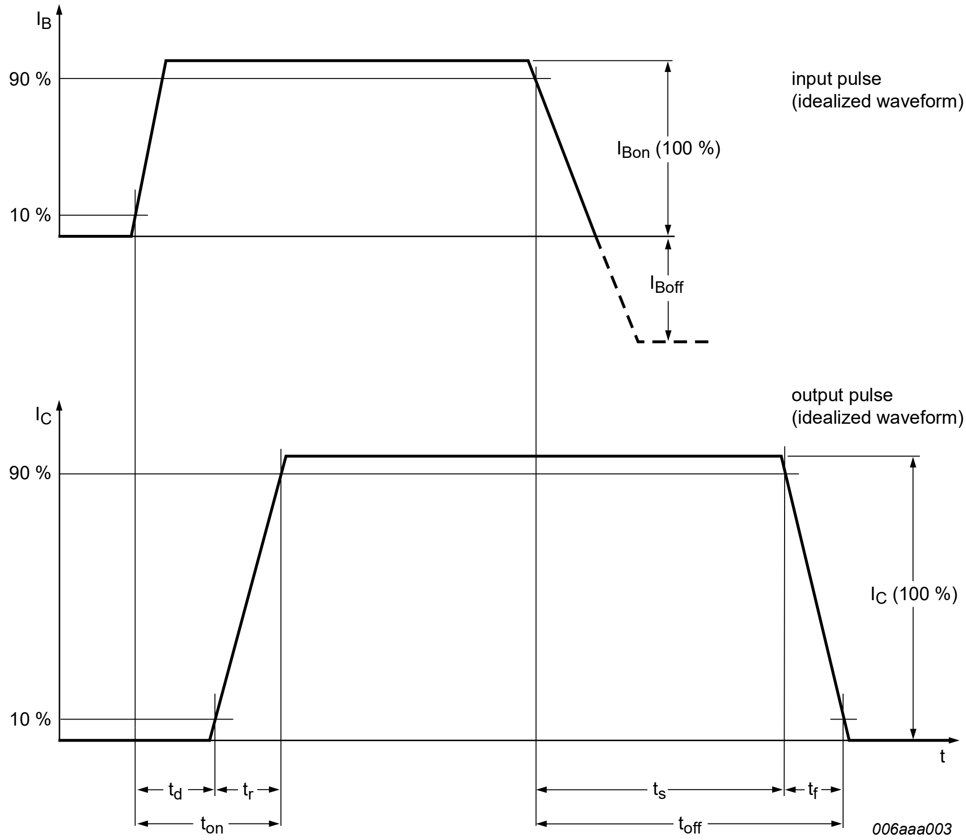


Fig. 14. TR1 (NPN): Transistor switching time definition

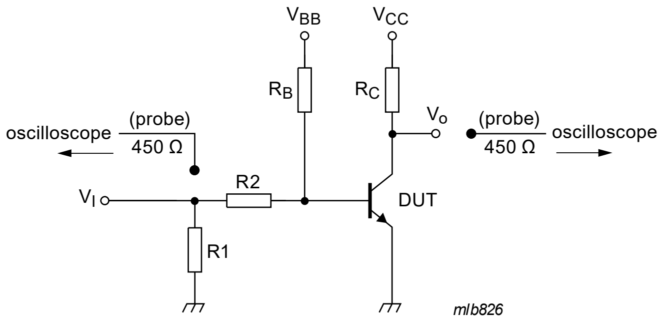


Fig. 15. TR1 (NPN): Test circuit for switching times

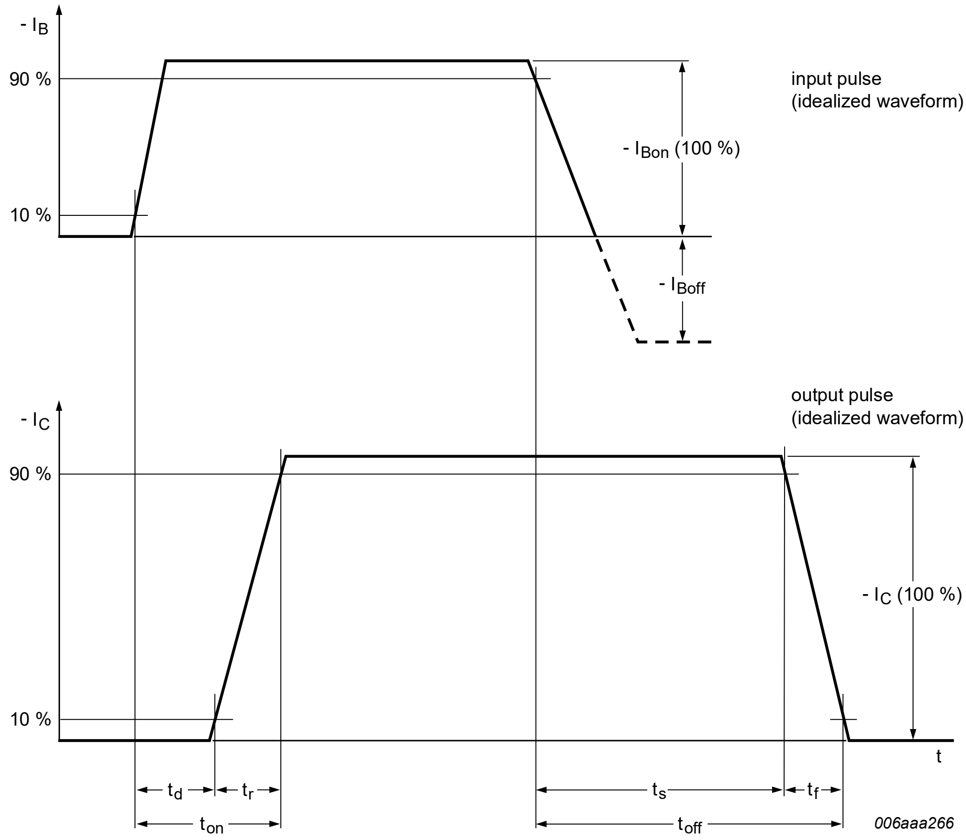


Fig. 16. TR2 (PNP): Transistor switching time definition

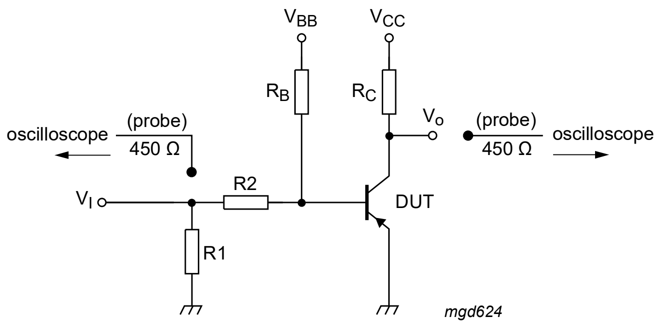


Fig. 17. TR2 (PNP): Test circuit for switching times

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.

12. Package outline

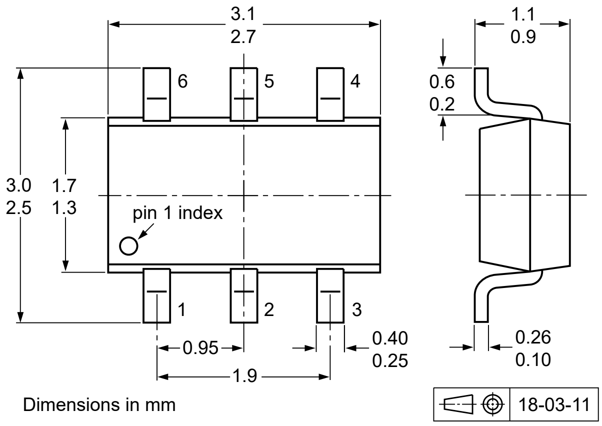


Fig. 18. Package outline TSOP6 (SOT457)

13. Soldering

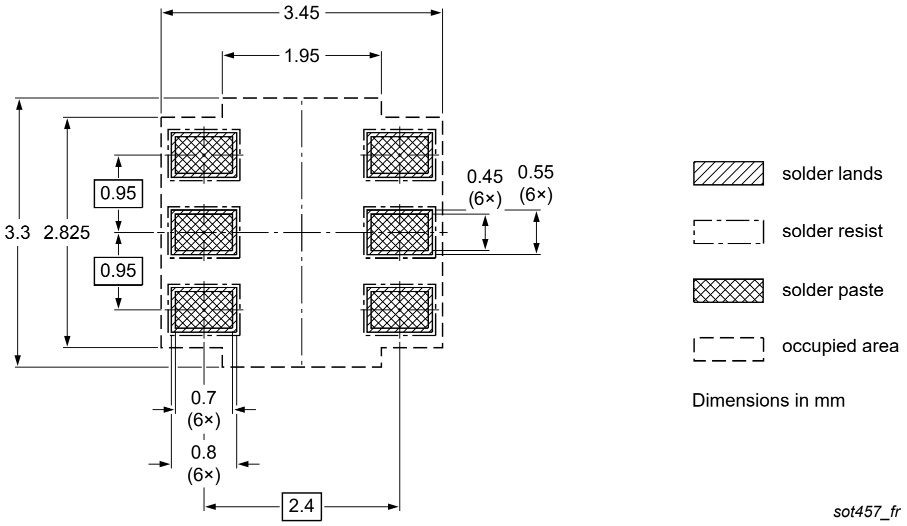


Fig. 19. Reflow soldering footprint for TSOP6 (SOT457)

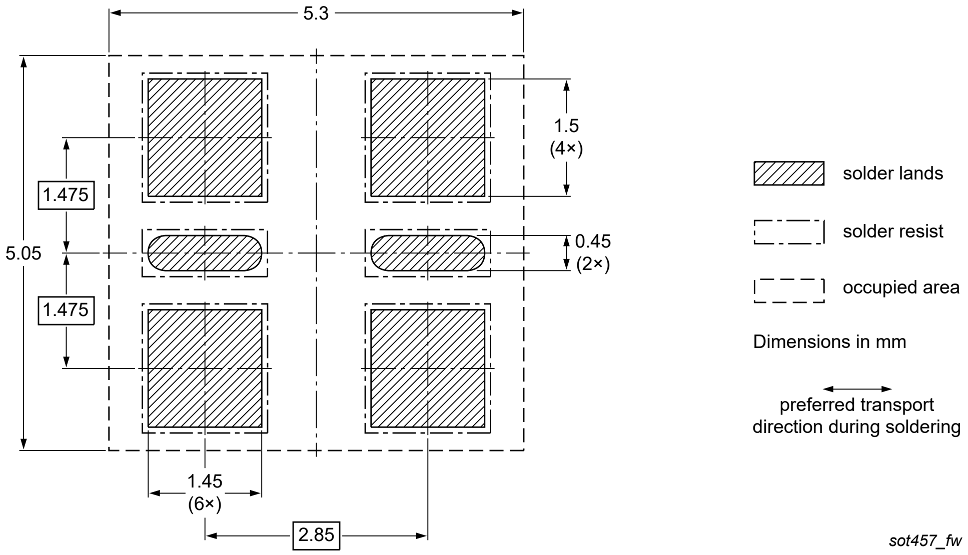


Fig. 20. Wave soldering footprint for TSOP6 (SOT457)

14. Revision history

Table 8. Revision history

Data sheet ID	Release date	Data sheet status	Change notice	Supersedes
NMB2227A v.2	20251112	Product data sheet	-	NMB2227A v.1
Modifications:	• Pinning: Entries in the table and graphic symbol corrected			
NMB2227A v.1	20160915	Product data sheet	-	-

15. Legal information

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.

[1] Please consult the most recently issued document before initiating or completing a design.
[2] The term 'short data sheet' is explained in section "Definitions".
[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the internet at https://www.nexperia.com.

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