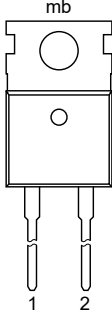
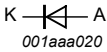


[illegible]

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Q_r	recovered charge	$I_F = 10\text{ A}$; $di_F/dt = 500\text{ A}/\mu\text{s}$; $V_R = 400\text{ V}$; $T_j = 25\text{ }^\circ\text{C}$; Fig. 6		-	12	-	nC

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode	 TO-220AC (SOD59A)	
2	A	anode		
mb	mb	mounting base; connected to cathode		

6. Ordering information

Table 3. Ordering information

Type number	Package		
	Name	Description	Version
NXPLQSC10650	TO-220AC	Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC	SOD59A

7. Marking

Table 4. Marking codes

Type number	Marking code
NXPLQSC10650	NXPLQSC10650

8. Limiting values

Table 5. Limiting values
In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V _{RRM}	repetitive peak reverse voltage		-	650	V
V _{RWM}	crest working reverse voltage		-	650	V
V _R	reverse voltage	DC	-	650	V
I _{F(AV)}	average forward current	δ = 0.5 ; T _{mb} ≤ 87 °C; square-wave pulse; Fig. 1; Fig. 2; Fig. 3	-	10	A
I _{FRM}	repetitive peak forward current	δ = 0.5 ; t _p = 25 μs; T _{mb} ≤ 87 °C; square-wave pulse	-	20	A
I _{FSM}	non-repetitive peak forward current	t _p = 8.3 ms; T _{j(init)} = 25 °C; sine-wave pulse	-	52	A
		t _p = 10 μs; T _{j(init)} = 25 °C; square-wave pulse	-	385	A
T _{stg}	storage temperature		-55	175	°C
T _j	junction temperature		-	175	°C

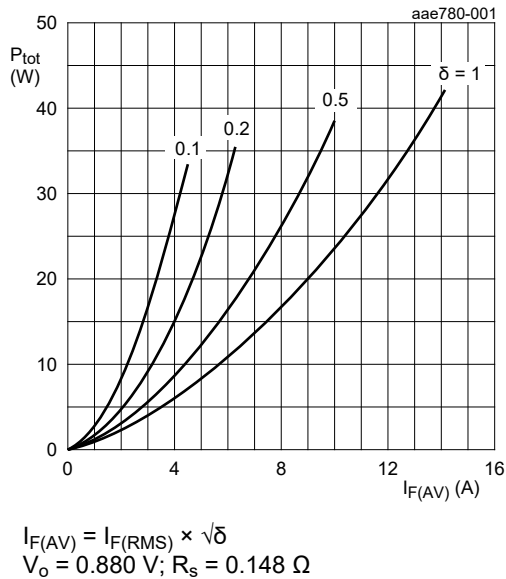


Fig. 1. Forward power dissipation as a function of average forward current; square waveform; maximum values

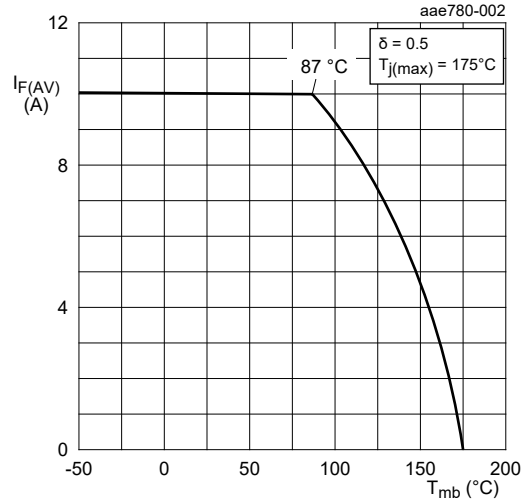


Fig. 2. Forward current as a function of mounting base temperature; maximum values

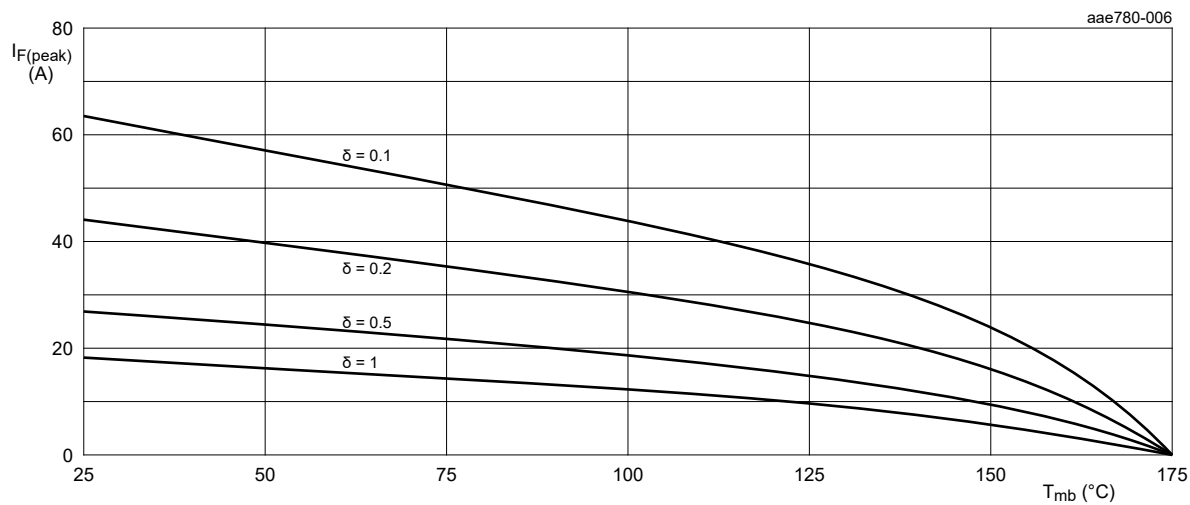


Fig. 3. Current derating as a function of mounting base temperature

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	Fig. 4		-	-	2.3	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient free air	in free air		-	60	-	K/W

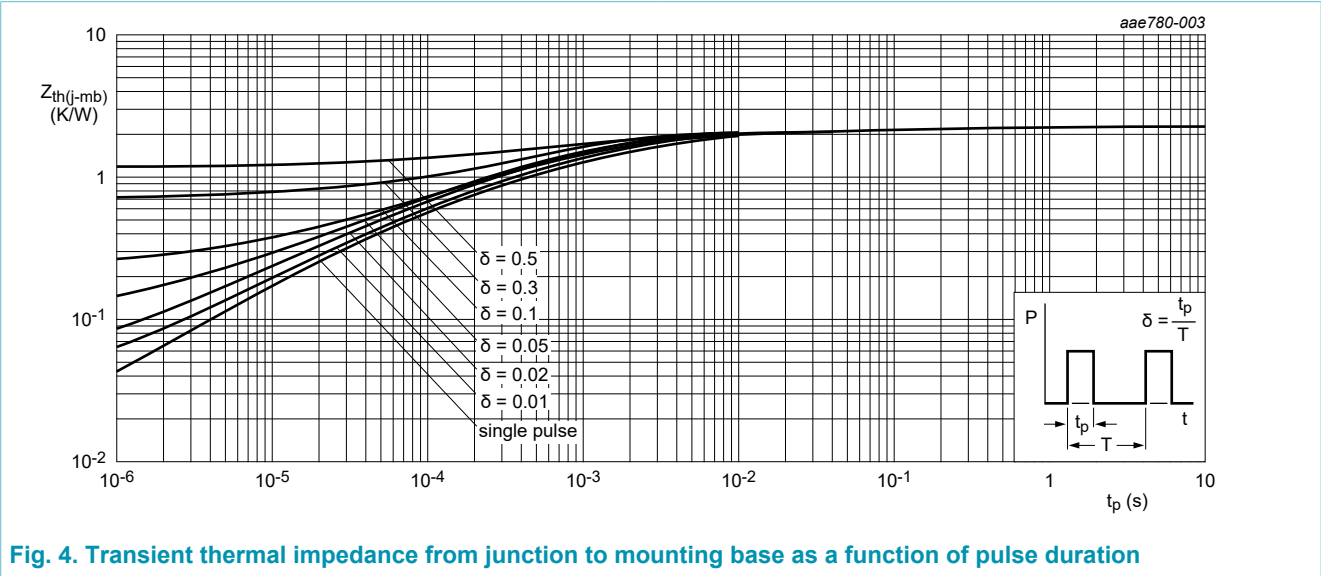
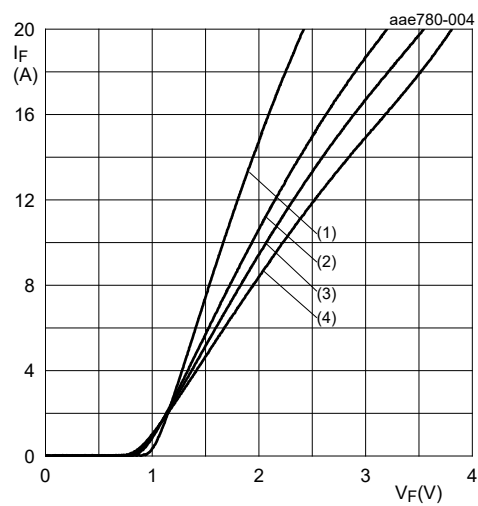


Fig. 4. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Characteristics

Table 7. Characteristics

Symbol	Parameter	Conditions		Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 10 A; T _j = 25 °C; Fig. 5		-	1.65	1.85	V
		I _F = 10 A; T _j = 150 °C; Fig. 5		-	2.1	2.5	V
I _R	reverse current	V _R = 650 V; T _j = 25 °C		-	-	230	μA
		V _R = 650 V; T _j = 150 °C		-	-	700	μA
Dynamic characteristics							
Q _r	recovered charge	I _F = 10 A; dI _F /dt = 500 A/μs; V _R = 400 V; T _j = 25 °C; Fig. 6		-	12	-	nC
C _d	diode capacitance	f = 1 MHz; V _R = 1 V; T _j = 25 °C		-	250	-	pF
		f = 1 MHz; V _R = 300 V; T _j = 25 °C		-	26	-	pF
		f = 1 MHz; V _R = 600 V; T _j = 25 °C		-	21	-	pF



V_o = 0.880 V; R_s = 0.148 Ω
(1) T_j = 25 °C; typical values
(2) T_j = 100 °C; typical values
(3) T_j = 150 °C; typical values
(4) T_j = 175 °C; typical values

Fig. 5. Forward current as a function of forward voltage; typical values

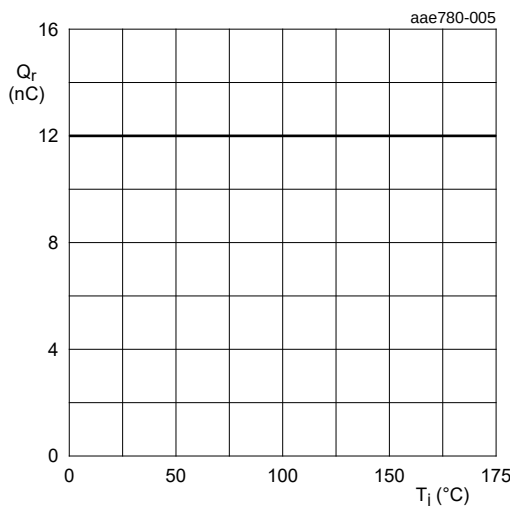
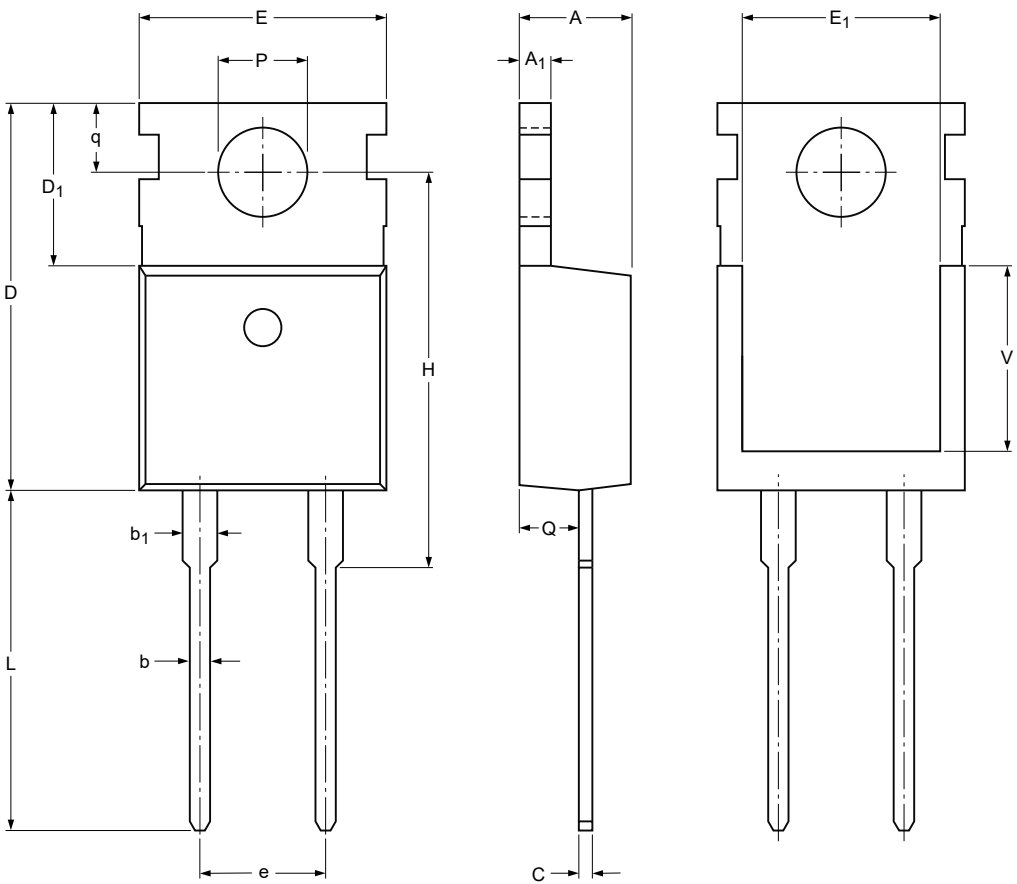


Fig. 6. Recovered charge as a function of junction temperature

11. Package outline

Plastic single-ended package; heatsink mounted; 1 mounting hole; 2-lead TO-220AC

SOD59A



Dimensions: (mm are the original dimensions)

Unit	A	A ₁	b	b ₁ (¹)	c	D	D ₁	E	e	H	L	P	Q	q	E ₁	V
max	4.7	1.40	0.95	1.70	0.65	15.8	6.8	10.30	5.08	16.25	15.0	3.80	2.6	2.95	8.1	6.9
nom									(REF)							(REF)
min	4.3	1.15	0.70	1.17	0.45	15.6	6.4	9.65		15.70	12.5	3.53	2.2	2.65	7.9	

Note

1. Protruded dambar are included in the dimension.

sod059a_po

Outline version	References				European projection	Issue date
	IEC	JEDEC	JEITA			
SOD59A		TO-220AC (2-lead)				15-03-24- 15-03-30

Fig. 7. Package outline TO-220AC (SOD59A)

12. 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".
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13. Contents

1. General description..... 1

2. Features and benefits..... 1

3. Applications..... 1

4. Quick reference data..... 1

5. Pinning information.....2

6. Ordering information.....2

7. Marking.....2

8. Limiting values..... 3

9. Thermal characteristics..... 5

10. Characteristics.....6

11. Package outline..... 7

12. Legal information..... 8

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