

# DATA SHEET

## **BYC10-600CT**

Dual rectifier diode  
ultrafast, low switching loss

Product specification

March 2001



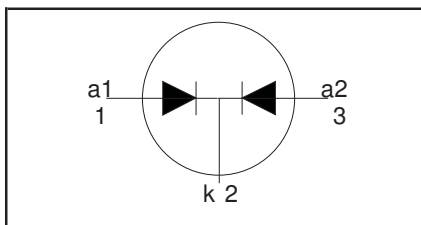
## Rectifier diode ultrafast, low switching loss

BYC10-600CT

### FEATURES

- Dual diode
- Extremely fast switching
- Low reverse recovery current
- Low thermal resistance
- Reduces switching losses in associated MOSFET

### SYMBOL



### QUICK REFERENCE DATA

$V_R = 600\text{ V}$   
 $V_F \leq 1.75\text{ V}$   
 $I_{O(AV)} = 10\text{ A}$   
 $t_{rr} = 19\text{ ns (typ)}$

### APPLICATIONS

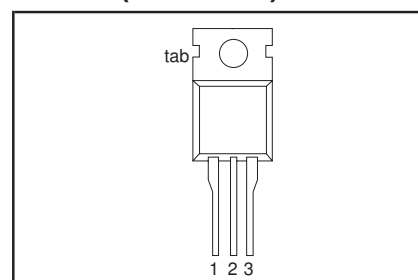
- Active power factor correction
- Half-bridge lighting ballasts
- Half-bridge/ full-bridge switched mode power supplies.

The BYC10-600CT is supplied in the SOT78 (TO220AB) conventional leaded package.

### PINNING

PIN	DESCRIPTION
1	anode 1
2	cathode
3	anode 2
tab	cathode

### SOT78 (TO220AB)



### LIMITING VALUES

Limiting values in accordance with the Absolute Maximum System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{RRM}$	Peak repetitive reverse voltage		-	600	V
$V_{RWM}$	Crest working reverse voltage		-	600	V
$V_R$	Continuous reverse voltage		-	500	V
$I_{O(AV)}$	Average output current (both diodes conducting)	$T_{mb} \leq 110\text{ °C}$ $\delta = 0.5$ ; with reapplied $V_{RRM(max)}$ ;	-	10	A
$I_{FRM}$	Repetitive peak forward current per diode	$T_{mb} \leq 50\text{ °C}^1$ $\delta = 0.5$ ; with reapplied $V_{RRM(max)}$ ;	-	10	A
$I_{FSM}$	Non-repetitive peak forward current per diode	$T_{mb} \leq 50\text{ °C}^1$ $t = 10\text{ ms}$	-	40	A
		$t = 8.3\text{ ms}$ sinusoidal; $T_j = 150\text{ °C}$ prior to surge with reapplied $V_{RWM(max)}$	-	44	A
$T_{stg}$	Storage temperature		-40	150	°C
$T_j$	Operating junction temperature		-	150	°C

### THERMAL RESISTANCES

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$R_{th\ j-mb}$	Thermal resistance junction to mounting base	per diode	-	-	2.5	K/W
$R_{th\ j-a}$	Thermal resistance junction to ambient	both diodes in free air.	-	-	2.2	K/W
			-	60	-	K/W

<sup>1</sup>  $T_{mb(max)}$  limited by thermal runaway

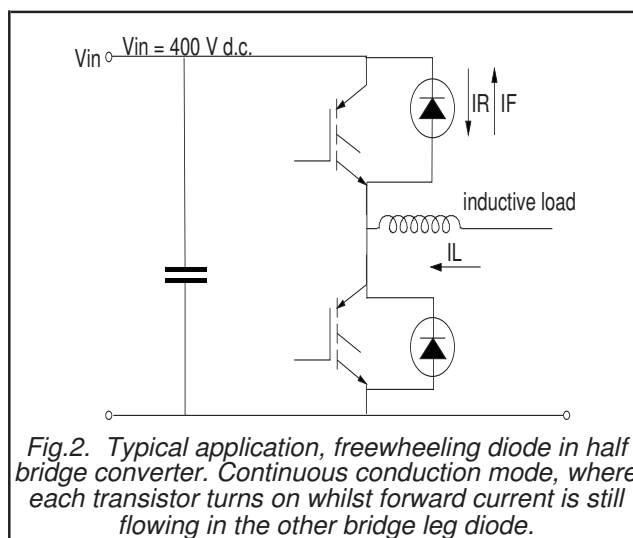
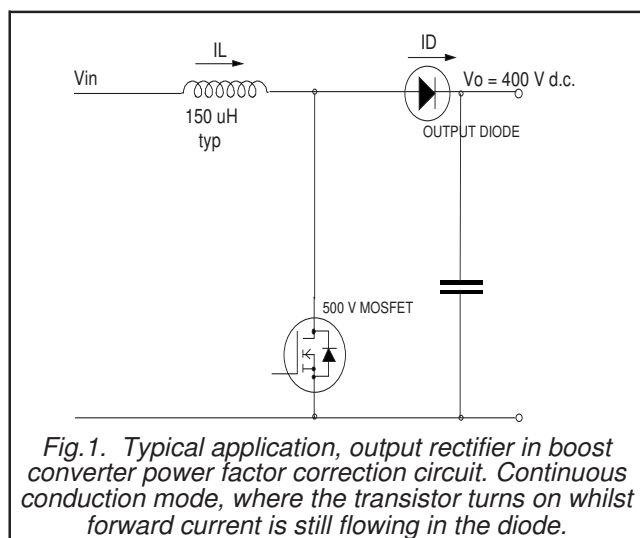
# Rectifier diode ultrafast, low switching loss

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## ELECTRICAL CHARACTERISTICS

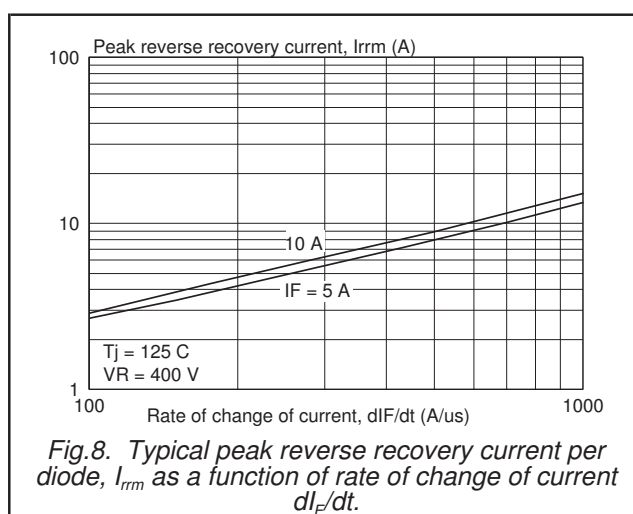
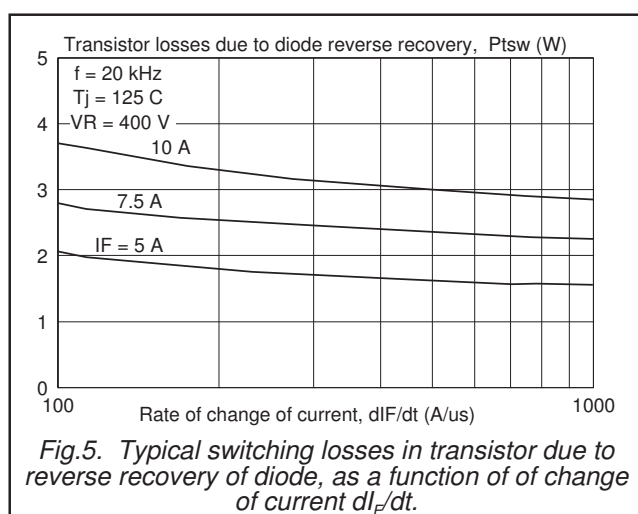
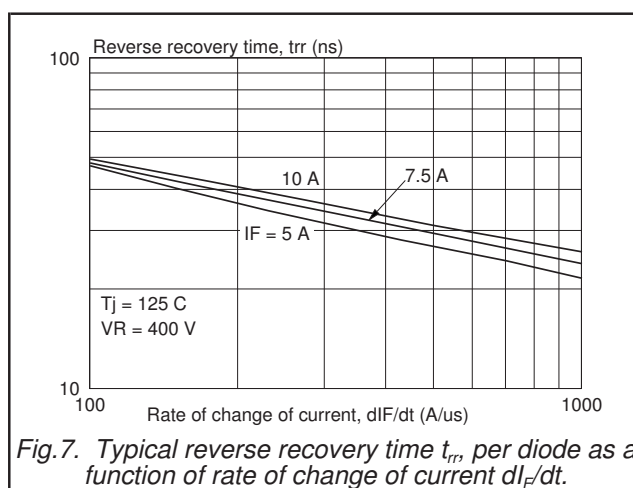
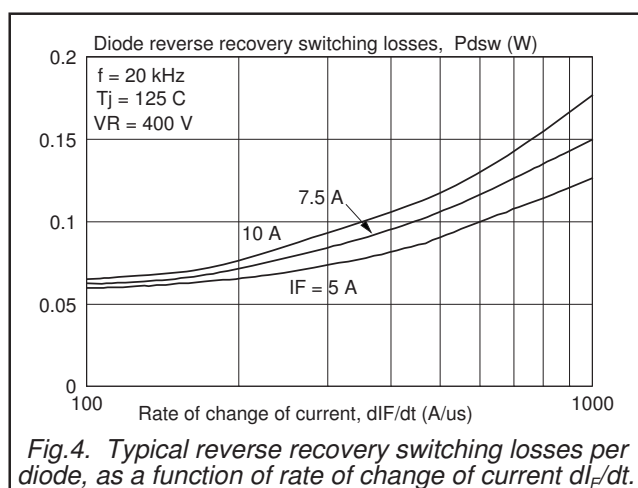
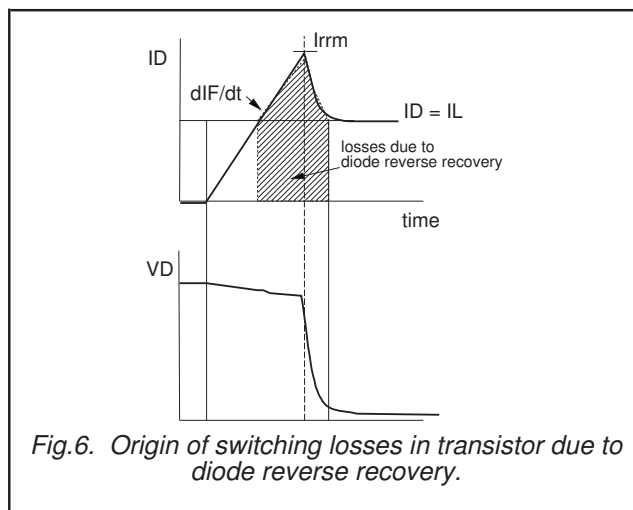
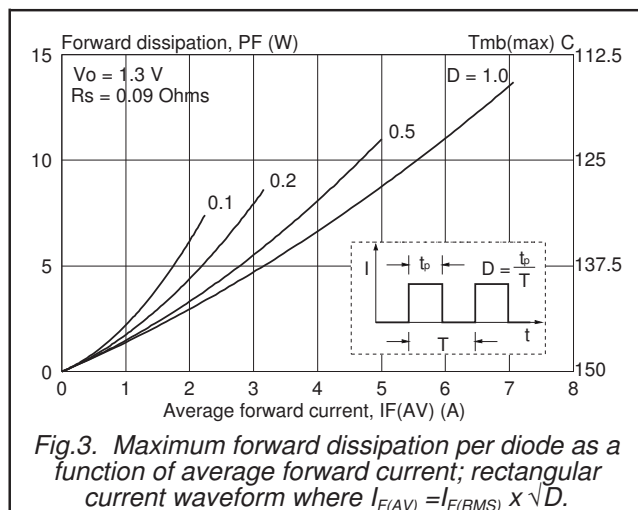
$T_j = 25\text{ }^{\circ}\text{C}$ , per diode unless otherwise stated

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_F$	Forward voltage	$I_F = 5\text{ A}$ ; $T_j = 150\text{ }^{\circ}\text{C}$	-	1.4	1.75	V
		$I_F = 10\text{ A}$ ; $T_j = 150\text{ }^{\circ}\text{C}$	-	1.75	2.2	V
$I_R$	Reverse current	$I_F = 5\text{ A}$ ; $V_R = 600\text{ V}$	-	2.0	2.9	V
		$V_R = 500\text{ V}$ ; $T_j = 100\text{ }^{\circ}\text{C}$	-	9	100	$\mu\text{A}$
			-	0.9	3.0	mA
$t_{rr}$	Reverse recovery time	$I_F = 1\text{ A}$ ; $V_R = 30\text{ V}$ ; $di_F/dt = 50\text{ A}/\mu\text{s}$	-	30	50	ns
$t_{rr}$	Reverse recovery time	$I_F = 5\text{ A}$ ; $V_R = 400\text{ V}$ ; $di_F/dt = 500\text{ A}/\mu\text{s}$	-	19	-	ns
$t_{rr}$	Reverse recovery time	$I_F = 5\text{ A}$ ; $V_R = 400\text{ V}$ ; $di_F/dt = 500\text{ A}/\mu\text{s}$ ; $T_j = 100\text{ }^{\circ}\text{C}$	-	25	30	ns
$I_{rrm}$	Peak reverse recovery current	$I_F = 5\text{ A}$ ; $V_R = 400\text{ V}$ ; $di_F/dt = 50\text{ A}/\mu\text{s}$ ; $T_j = 125\text{ }^{\circ}\text{C}$	-	0.7	3	A
$I_{rrm}$	Peak reverse recovery current	$I_F = 5\text{ A}$ ; $V_R = 400\text{ V}$ ; $di_F/dt = 500\text{ A}/\mu\text{s}$ ; $T_j = 125\text{ }^{\circ}\text{C}$	-	8	11	A
$V_{fr}$	Forward recovery voltage	$I_F = 10\text{ A}$ ; $di_F/dt = 100\text{ A}/\mu\text{s}$	-	9	11	V



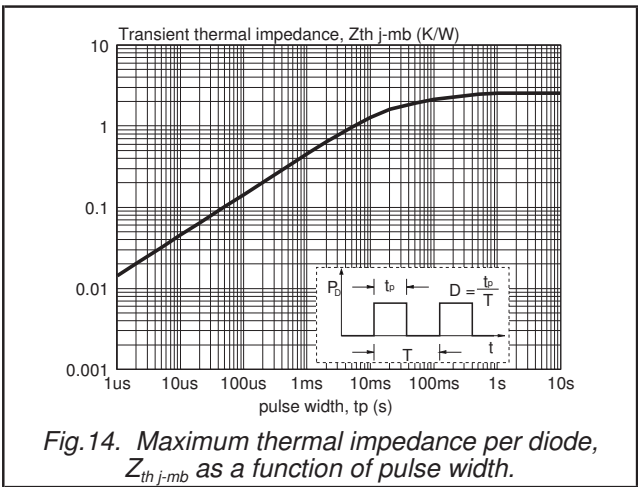
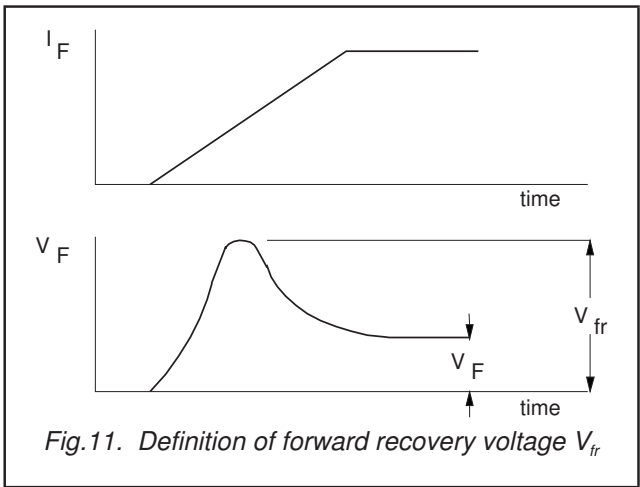
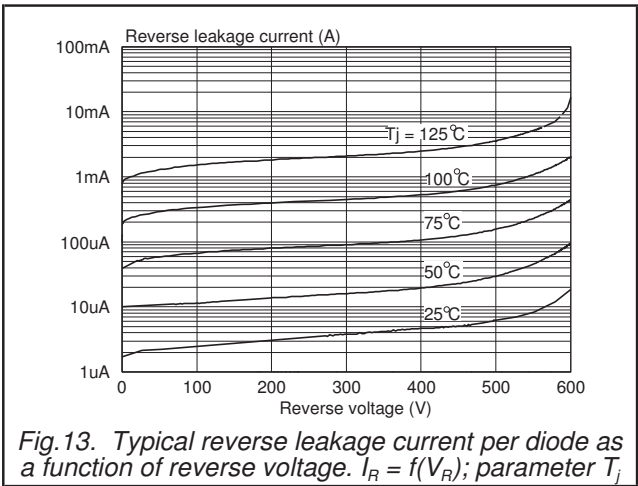
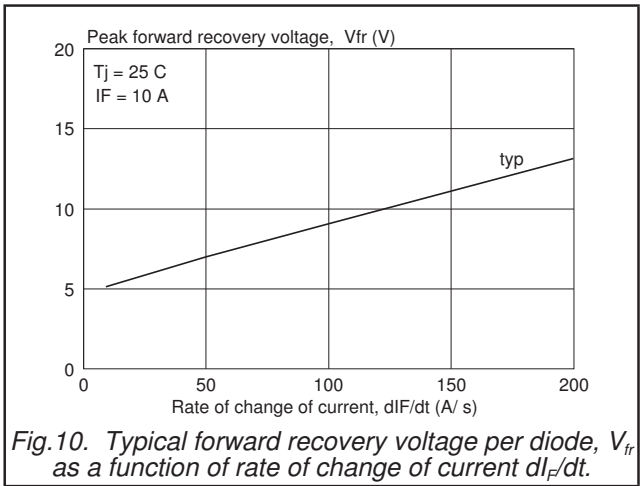
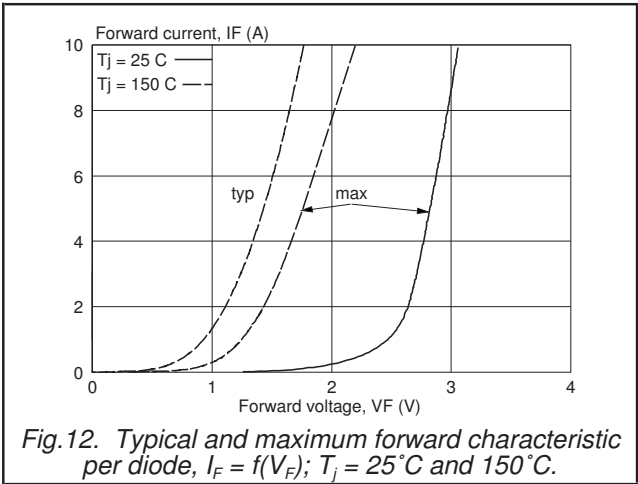
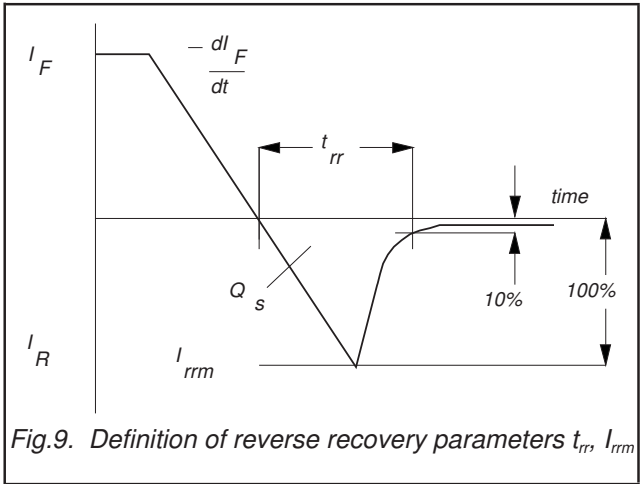
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## MECHANICAL DATA

Dimensions in mm

Net Mass: 2 g

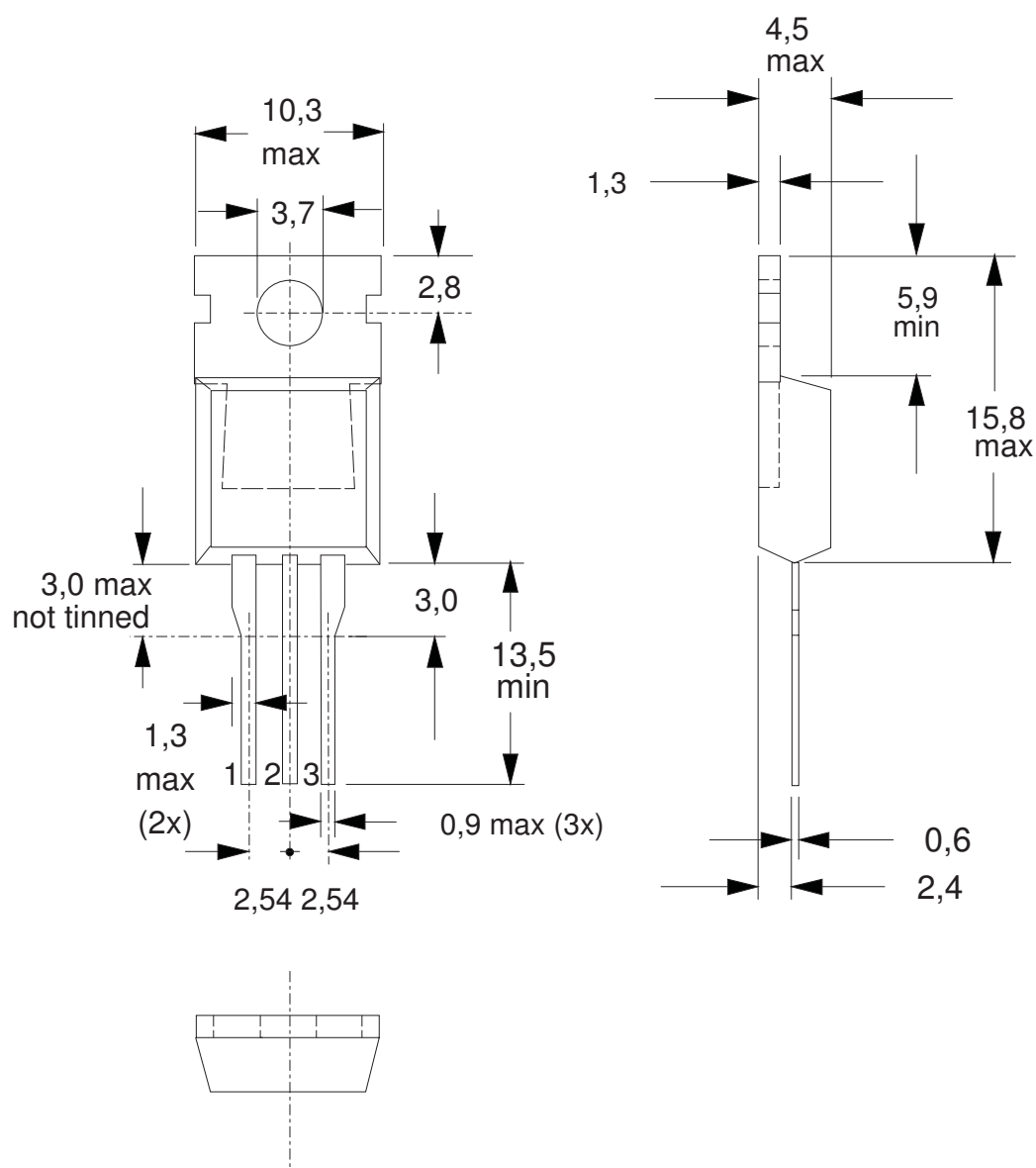


Fig.15. SOT78 (TO220AB); pin 2 connected to mounting base.

### Notes

1. Refer to mounting instructions for SOT78 (TO220) envelopes.
2. Epoxy meets UL94 V0 at 1/8".

## Legal information

### DATA SHEET STATUS

DOCUMENT STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)</sup>	DEFINITION
Objective data sheet	Development	This document contains data from the objective specification for product development.
Preliminary data sheet	Qualification	This document contains data from the preliminary specification.
Product data sheet	Production	This document contains the product specification.

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