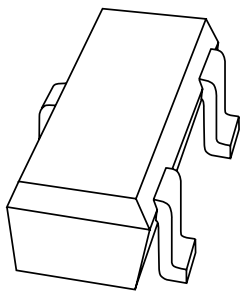


# DATA SHEET



## **PDT143EK** NPN resistor-equipped transistor

Product specification  
Supersedes data of 1997 Jun 16  
File under Discrete Semiconductors, SC04

1998 May 18

# NPN resistor-equipped transistor

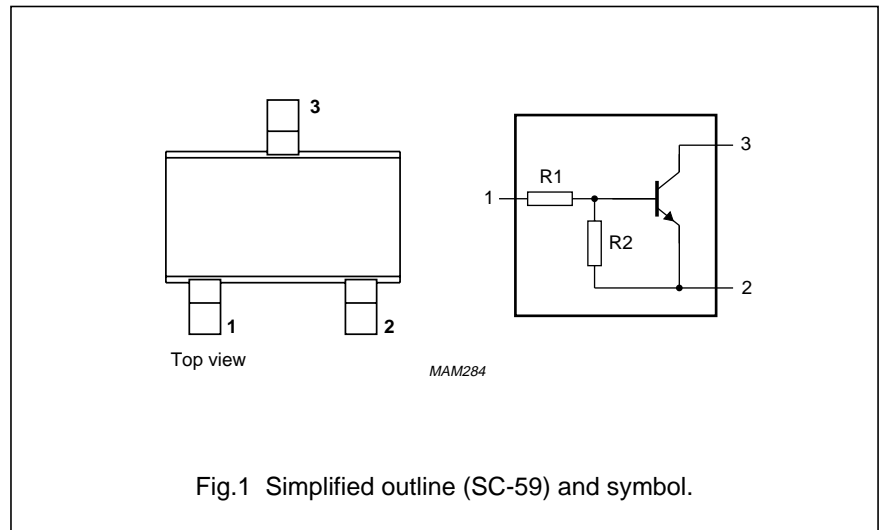
# PDTC143EK

### FEATURES

- Built-in bias resistors R1 and R2 (typ. 4.7 kΩ each)
- Simplification of circuit design
- Reduces number of components and board space.

### APPLICATIONS

- Especially suitable for space reduction in interface and driver circuits
- Inverter circuit configurations without use of external resistors.

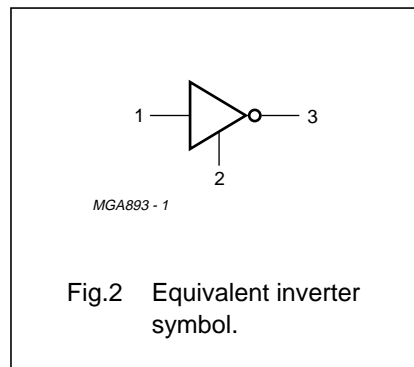


### DESCRIPTION

NPN resistor-equipped transistor in an SC-59 plastic package.  
PNP complement: PDTA143EK.

### PINNING

PIN	DESCRIPTION
1	base/input
2	emitter/ground
3	collector/output



### MARKING

TYPE NUMBER	MARKING CODE
PDTC143EK	02

### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$V_{CE0}$	collector-emitter voltage	open base	–	–	50	V
$I_O$	output current (DC)		–	–	100	mA
$I_{CM}$	peak collector current		–	–	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$	–	–	250	mW
$h_{FE}$	DC current gain	$I_C = 10\text{ mA}; V_{CE} = 5\text{ V}$	30	–	–	
R1	input resistor		3.3	4.7	6.1	kΩ
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	

## NPN resistor-equipped transistor

## PDTC143EK

**LIMITING VALUES**

In accordance with the Absolute Maximum Rating System (IEC 134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	50	V
$V_{CEO}$	collector-emitter voltage	open base	–	50	V
$V_{EBO}$	emitter-base voltage	open collector	–	10	V
$V_i$	input voltage positive negative		–	+30	V
			–	–10	V
$I_o$	output current (DC)		–	100	mA
$I_{CM}$	peak collector current		–	100	mA
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\text{ °C}$ ; note 1	–	250	mW
$T_{stg}$	storage temperature		–65	+150	°C
$T_j$	junction temperature		–	150	°C
$T_{amb}$	operating ambient temperature		–65	+150	°C

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

**THERMAL CHARACTERISTICS**

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	note 1	500	K/W

**Note**

1. Transistor mounted on an FR4 printed-circuit board.

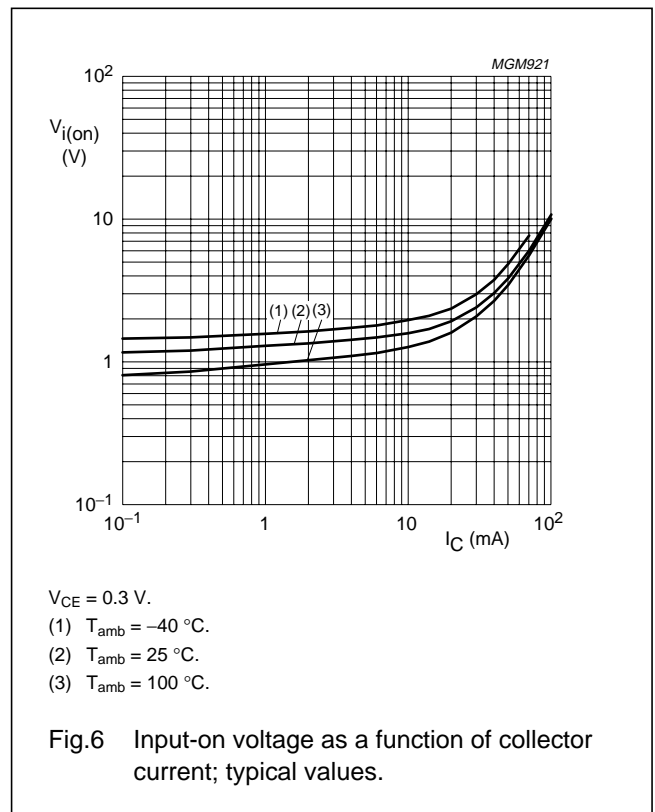
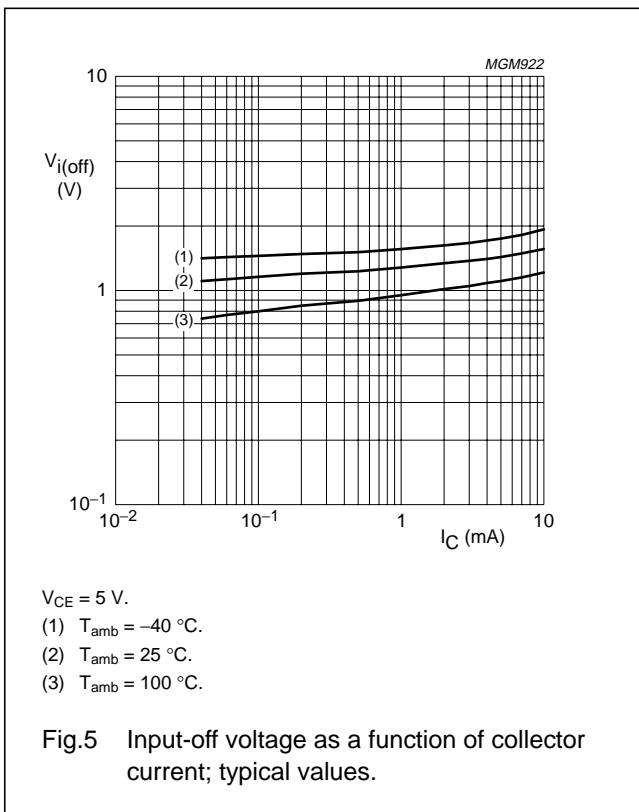
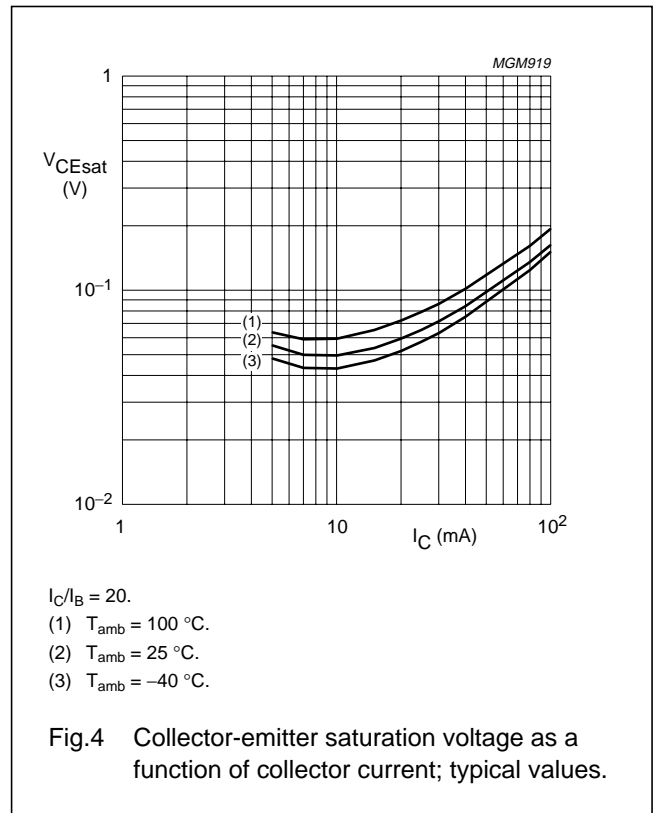
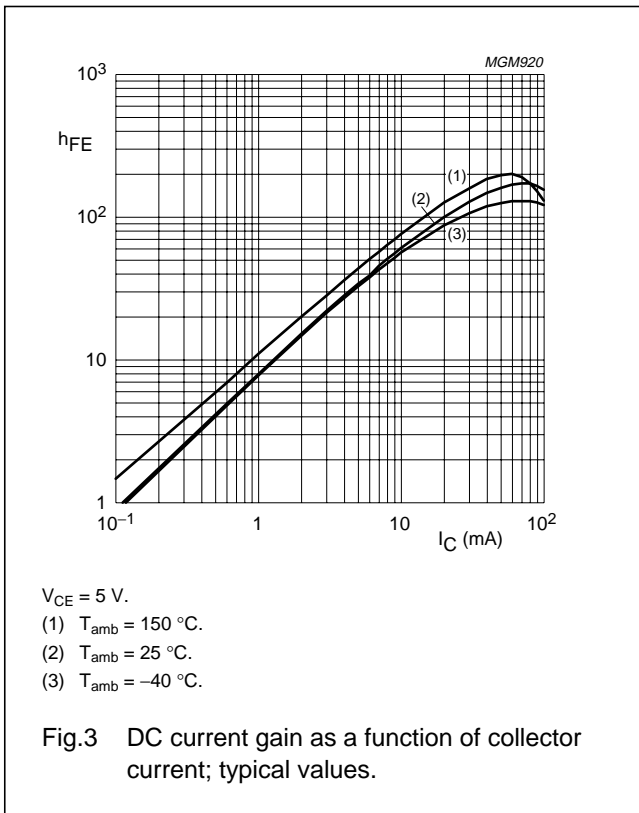
**CHARACTERISTICS**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$I_E = 0$ ; $V_{CB} = 50\text{ V}$	–	–	100	nA
$I_{CEO}$	collector cut-off current	$I_B = 0$ ; $V_{CE} = 30\text{ V}$	–	–	1	$\mu\text{A}$
		$I_B = 0$ ; $V_{CE} = 30\text{ V}$ ; $T_j = 150\text{ °C}$	–	–	50	$\mu\text{A}$
$I_{EBO}$	emitter cut-off current	$I_C = 0$ ; $V_{EB} = 5\text{ V}$	–	–	0.9	mA
$h_{FE}$	DC current gain	$I_C = 10\text{ mA}$ ; $V_{CE} = 5\text{ V}$	30	–	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = 10\text{ mA}$ ; $I_B = 0.5\text{ mA}$	–	–	150	mV
$V_{i(off)}$	input-off voltage	$I_C = 100\text{ }\mu\text{A}$ ; $V_{CE} = 5\text{ V}$	–	1.1	0.5	V
$V_{i(on)}$	input-on voltage	$I_C = 20\text{ mA}$ ; $V_{CE} = 0.3\text{ V}$	2.5	1.9	–	V
R1	input resistor		3.3	4.7	6.1	k $\Omega$
$\frac{R2}{R1}$	resistor ratio		0.8	1	1.2	
$C_c$	collector capacitance	$I_E = I_e = 0$ ; $V_{CB} = 10\text{ V}$ ; $f = 1\text{ MHz}$	–	–	2.5	pF

NPN resistor-equipped transistor

PDTC143EK



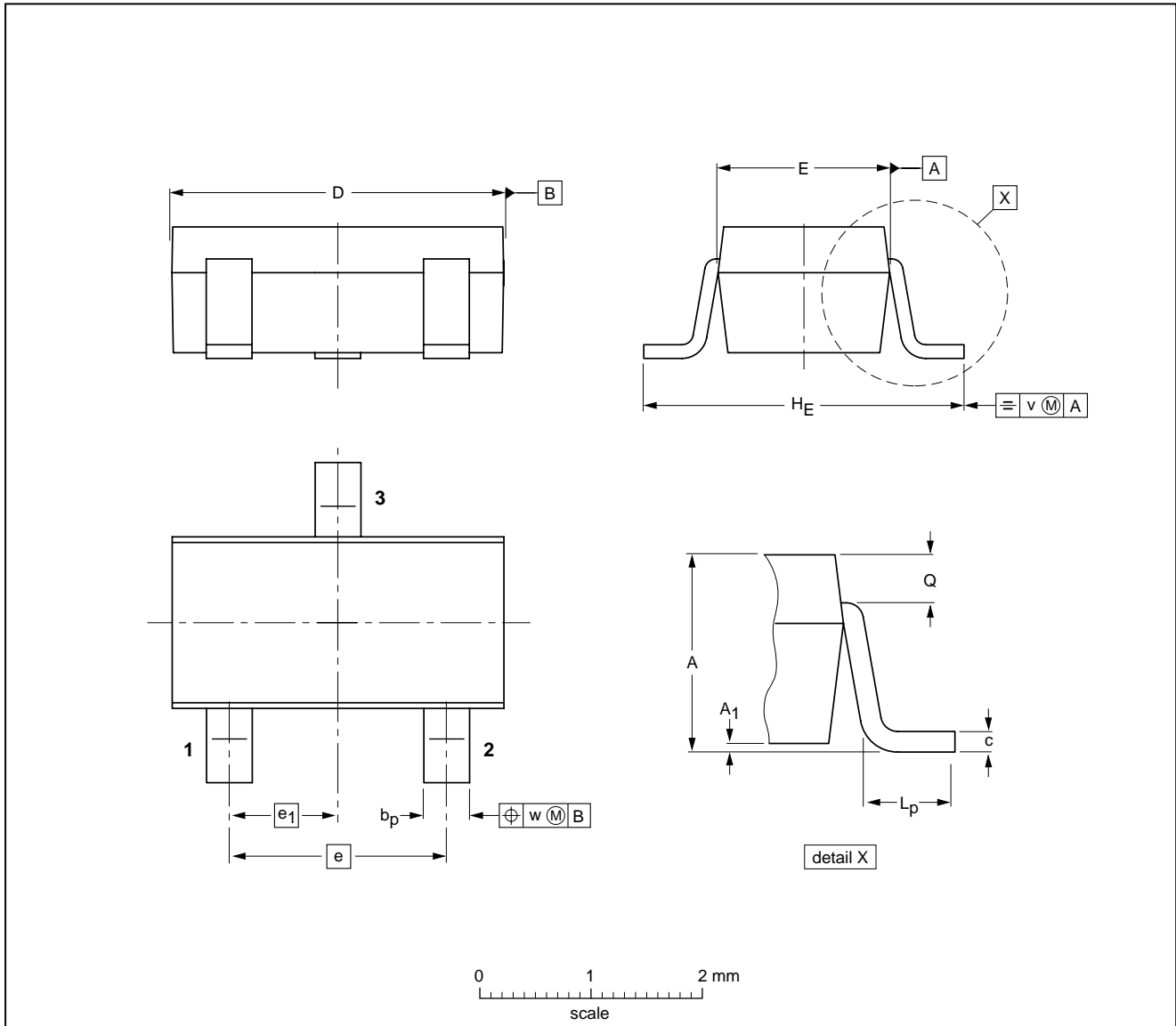
NPN resistor-equipped transistor

PDTC143EK

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT346



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub>	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	Q	v	w
mm	1.3 1.0	0.1 0.013	0.50 0.35	0.26 0.10	3.1 2.7	1.7 1.3	1.9	0.95	3.0 2.5	0.6 0.2	0.33 0.23	0.2	0.2

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT346		TO-236	SC-59			97-02-28

## NPN resistor-equipped transistor

PDTC143EK

**DEFINITIONS**

<b>Data Sheet Status</b>	
Objective specification	This data sheet contains target or goal specifications for product development.
Preliminary specification	This data sheet contains preliminary data; supplementary data may be published later.
Product specification	This data sheet contains final product specifications.
<b>Limiting values</b>	
Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

**LIFE SUPPORT APPLICATIONS**

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NPN resistor-equipped transistor

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