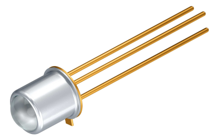
Silicon NPN Phototransistor
Version 1.3

BPX 43



Features:
- **Spectral range of sensitivity:** (typ) 450 ... 1100 nm
- **Package:** Metal Can (TO-18), hermetically sealed
- **Special:** Base connection
- Suitable up to 125°C
- High linearity
- Available in groups

Applications
- Photointerrupters
- Industrial electronics
- For control and drive circuits

Ordering Information

Type:	**Photocurrent** I_{PCE} [µA] **λ = 950 nm, E_e = 0.5 mW/cm^2, V_{CE} = 5 V**	**Ordering Code**
BPX 43	≥ 800	Q62702P0016
BPX 43-3/4	1250 ... 4000	Q62702P3581
BPX 43-4	2000 ... 4000	Q62702P0016S004
BPX 43-4/5	≥ 2000	Q62702P3582
BPX 43-5	≥ 3200	Q62702P0016S005

Note: Only one bin within one packing unit (variation less than 2:1)

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Maximum Ratings (T_A = 25 °C)

Parameter	Symbol	Values	Unit
Operating and storage temperature range	T_{op}; T_{stg}	-40 ... 125	°C
Collector-emitter voltage	V_{CE}	50	V
Collector current	I_C	50	mA
Collector surge current (τ < 10 µs)	I_{CS}	200	mA
Emitter-base voltage	V_{EB}	7	V
Total Power dissipation	P_{tot}	220	mW
Thermal resistance	R_{thJA}	450	K / W
ESD withstand voltage (acc. to ANSI/ ESDA/ JEDEC JS-001 - HBM)	V_{ESD}	2000	V

Characteristics (T_A = 25 °C)

Parameter		Symbol	Values	Unit
Wavelength of max. sensitivity	(typ)	$\lambda_{S\,max}$	880	nm
Spectral range of sensitivity	(typ)	$\lambda_{10\%}$	(typ) 450 ... 1100	nm
Radiant sensitive area	(typ)	A	0.675	mm^2
Dimensions of chip area	(typ)	L x W	(typ) 1.02 x 1.02	mm x mm
Half angle	(typ)	φ	± 15	°
Photocurrent of collector-base photodiode (λ = 950 nm, E_e = 0.5 mW/cm^2, V_{CB} = 5 V)	(typ)	I_{PCB}	11	µA
Photocurrent of collector-base photodiode (E_V = 1000 lx, Std. Light A, V_{CB} = 5 V)	(typ)	I_{PCB}	35	µA
Capacitance (V_{CE} = 0 V, f = 1 MHz, E = 0)	(typ)	C_{CE}	23	pF
Capacitance (V_{CB} = 0 V, f = 1MHz, E = 0)	(typ)	C_{CB}	39	pF
Capacitance (V_{EB} = 0 V, f = 1MHz, E = 0)	(typ)	C_{EB}	47	pF
Dark current (V_{CE} = 20 V)	(typ (max))	I_{CE0}	20 (≤ 100)	nA

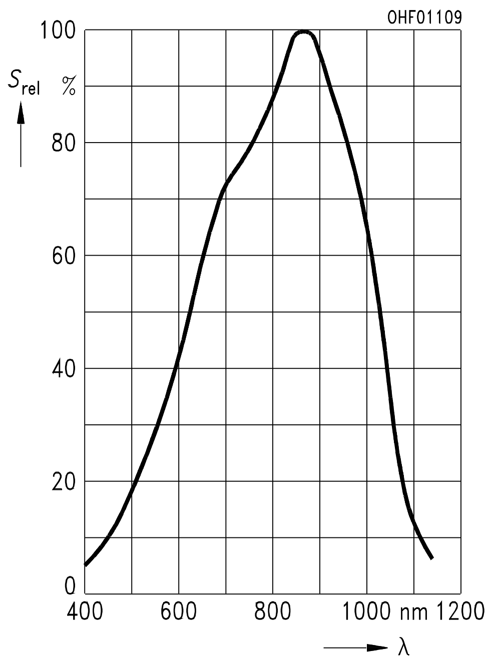
Grouping (T_A = 25 °C, λ = 950 nm)

Group	Min Photocurrent E_e = 0.5 mW/cm², V_{CE} = 5 V $I_{PCE, min}$ [µA]	Max Photocurrent E_e = 0.5 mW/cm², V_{CE} = 5 V $I_{PCE, max}$ [µA]	Typ Photocurrent E_V = 1000 lx, Std. Light A, V_{CE} = 5 V I_{PCE} [µA]	Rise and fall time I_C = 1 mA, V_{CC} = 5 V, R_L = 1 kΩ t_r, t_f [µs]
BPX 43-2	800	1600	3800	9
BPX 43-3	1250	2500	6000	12
BPX 43-4	2000	4000	9500	15
BPX 43-5	3200		15000	18

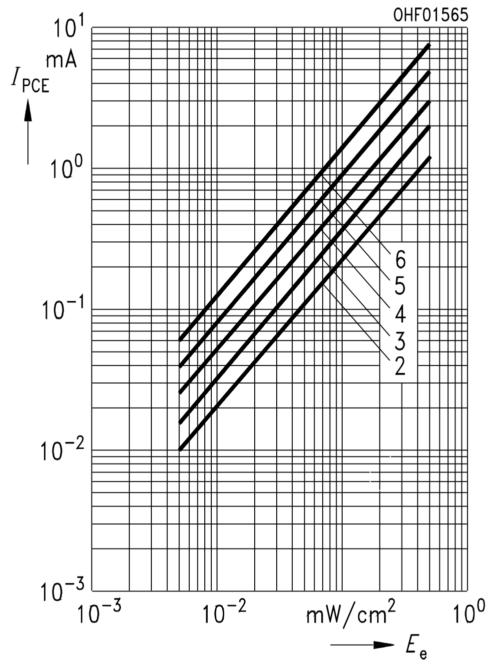
Group	Collector-emitter saturation voltage I_C = I_{PCEmin} x 0.3, E_e= 0.5 mW/cm² V_{CEsat} [mV]	Current gain E_e = 0.5 mW/cm², V_{CE} = 5 V I_{PCE} / I_{PCB}
BPX 43-2	200	110
BPX 43-3	220	170
BPX 43-4	240	270
BPX 43-5	260	430

Note.: *I_{PCEmin} is the min. photocurrent of the specified group.*

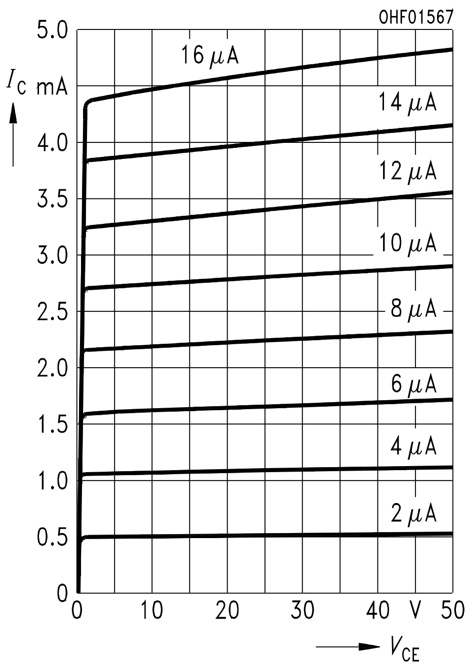
Relative Spectral Sensitivity 1) *page 9*
$S_{rel} = f(\lambda)$



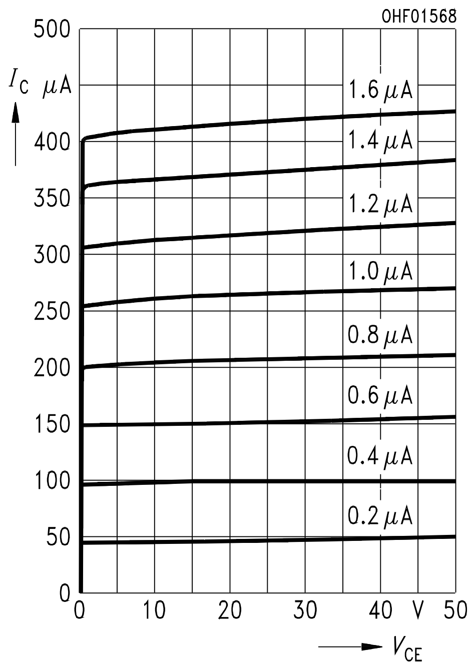
Photocurrent 1) *page 9*
$I_{PCE} = f(E_e)$, $V_{CE} = 5$ V



Collector Current 1) *page 9*
$I_C = f(V_{CE})$, I_B = Parameter



Collector Current 1) *page 9*
$I_C = f(V_{CE})$, I_B = Parameter



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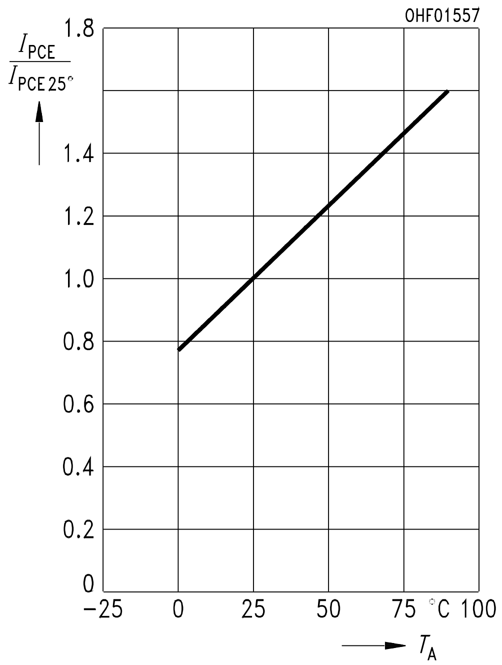
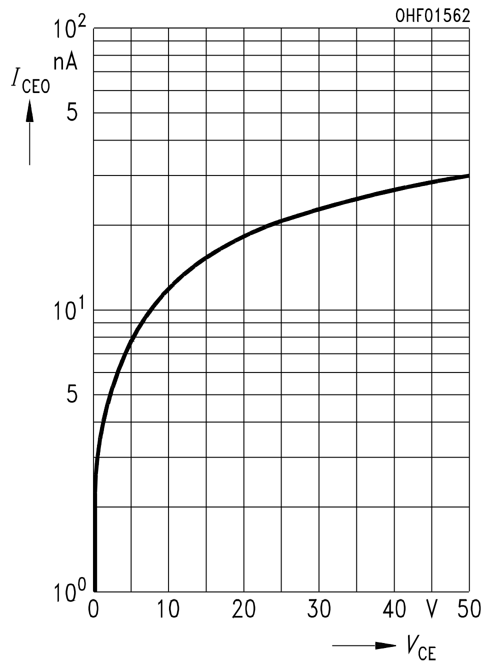
Photocurrent [1] *page 9*

I_{PCE} / I_{PCE}(25°C) = f(T_A), V_{CE} = 5 V



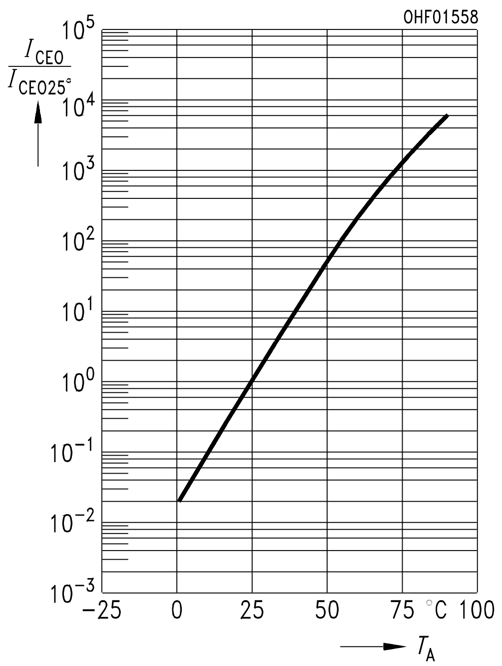
Dark Current [1] *page 9*

I_{CEO} = f(V_{CE}), E = 0



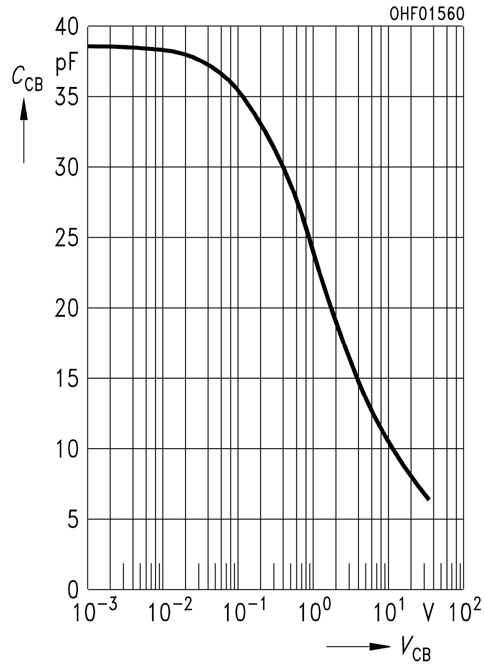
Dark Current [1] *page 9*

I_{CEO} = f(T_A), E = 0



Collector-Base Capacitance [1] *page 9*

C_{CB} = f(V_{CB}), f = 1 MHz, E = 0



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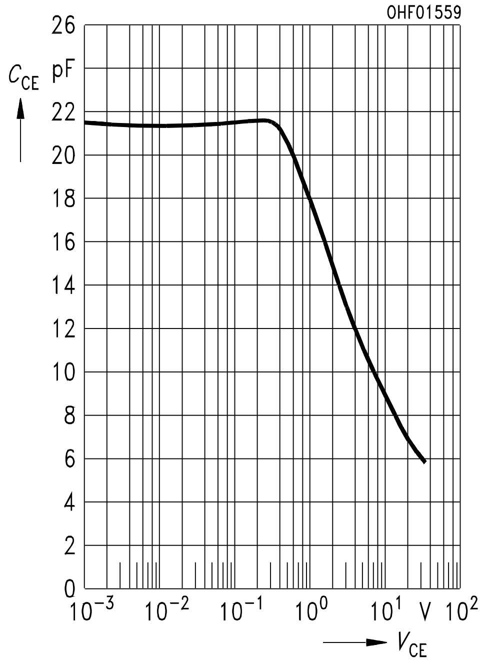
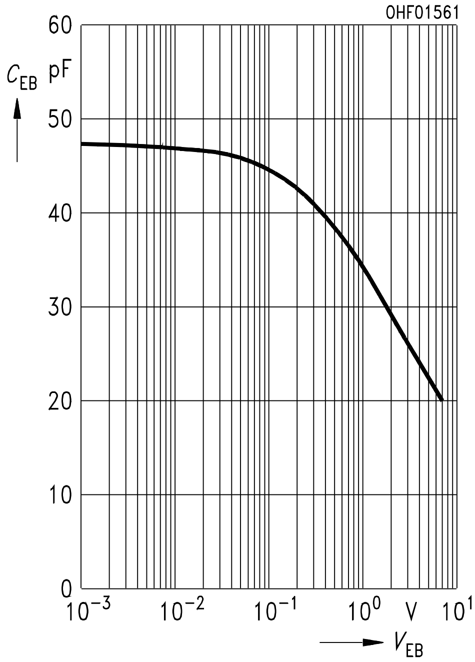
Collector-Emitter Capacitance 1) *page 9*

$C_{CE} = f(V_{CE})$, f = 1 MHz, E = 0



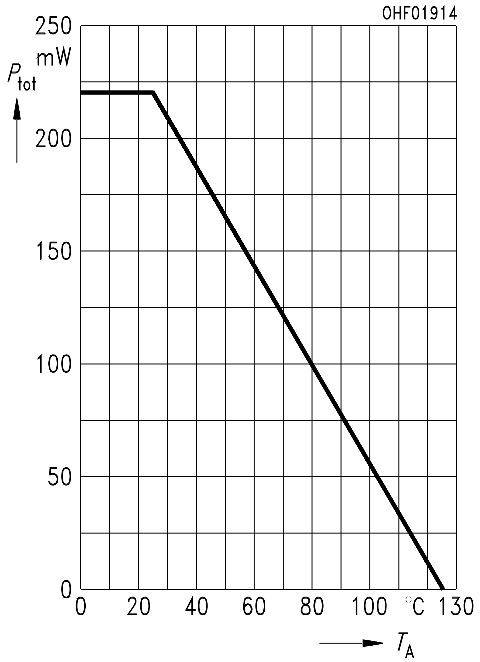
Emitter-Base Capacitance 1) *page 9*

$C_{EB} = f(V_{EB})$, f = 1 MHz, E = 0



Power Consumption

$P_{tot} = f(T_A)$



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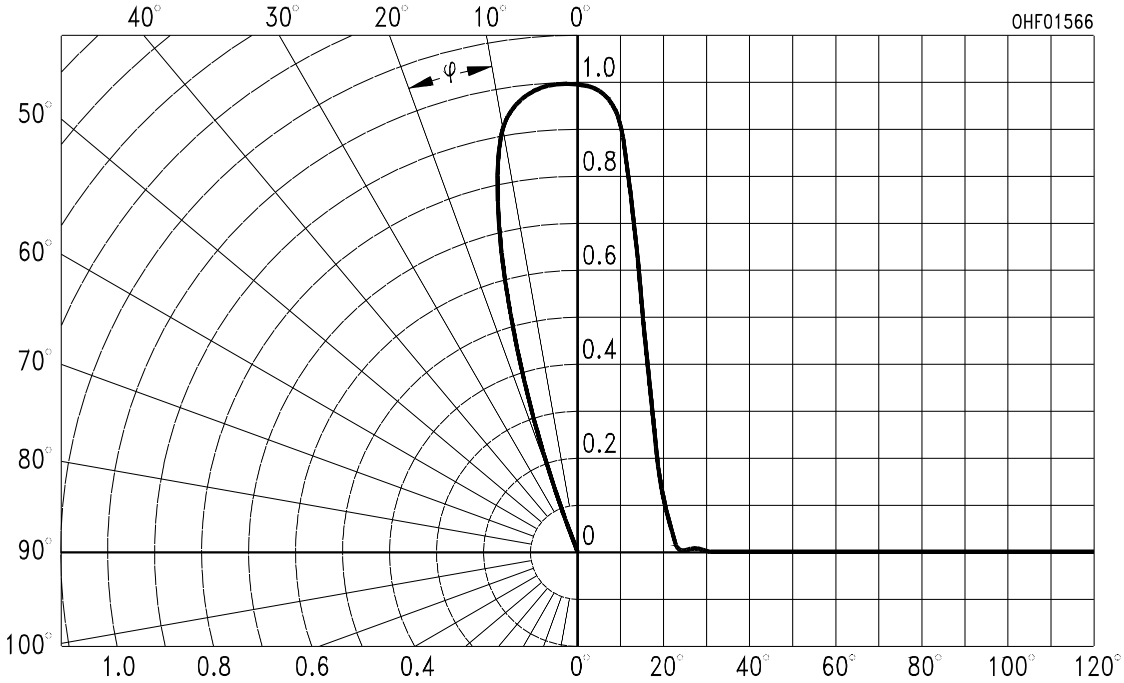
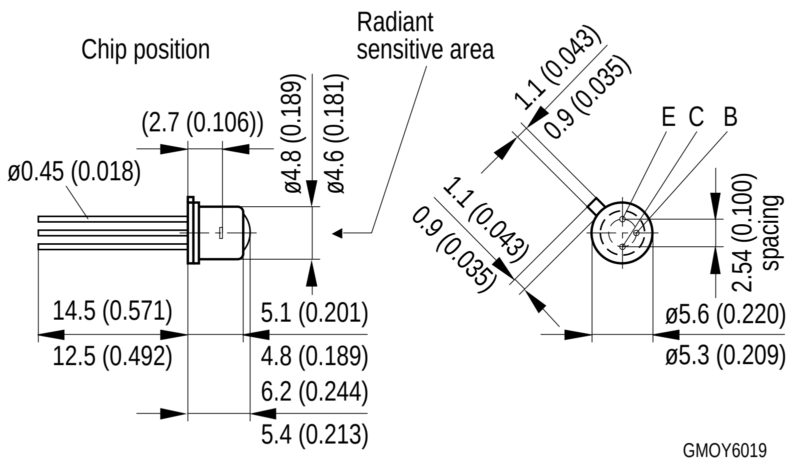
Directional Characteristics [1) page 9]

$S_{rel} = f(\phi)$



Package Outline



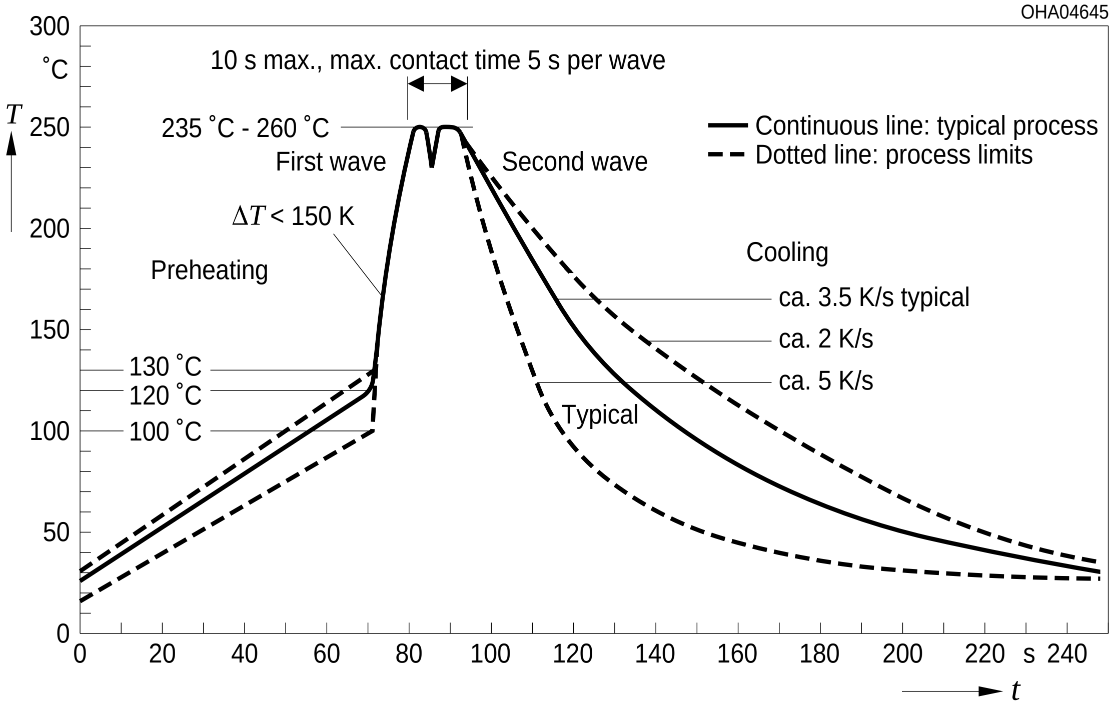
Dimensions in mm (inch).

Package

Metal Can (TO-18), hermetically sealed

Approximate Weight:
0.3 g

TTW Soldering
IEC-61760-1 TTW



Disclaimer

Language english will prevail in case of any discrepancies or deviations between the two language wordings.

Attention please!
The information describes the type of component and shall not be considered as assured characteristics.
Terms of delivery and rights to change design reserved. Due to technical requirements components may contain dangerous substances.
For information on the types in question please contact our Sales Organization.
If printed or downloaded, please find the latest version in the Internet.

Packing
Please use the recycling operators known to you. We can also help you – get in touch with your nearest sales office.
By agreement we will take packing material back, if it is sorted. You must bear the costs of transport. For packing material that is returned to us unsorted or which we are not obliged to accept, we shall have to invoice you for any costs incurred.

Components used in life-support devices or systems must be expressly authorized for such purpose!
Critical components* may only be used in life-support devices** or systems with the express written approval of OSRAM OS.

*) A critical component is a component used in a life-support device or system whose failure can reasonably be expected to cause the failure of that life-support device or system, or to affect its safety or the effectiveness of that device or system.
**) Life support devices or systems are intended (a) to be implanted in the human body, or (b) to support and/or maintain and sustain human life. If they fail, it is reasonable to assume that the health and the life of the user may be endangered.

Glossary

[1] **Typical Values:** Due to the special conditions of the manufacturing processes of LED, the typical data or calculated correlations of technical parameters can only reflect statistical figures. These do not necessarily correspond to the actual parameters of each single product, which could differ from the typical data and calculated correlations or the typical characteristic line. If requested, e.g. because of technical improvements, these typ. data will be changed without any further notice.