

NPN Silicon Darlington Power Transistor

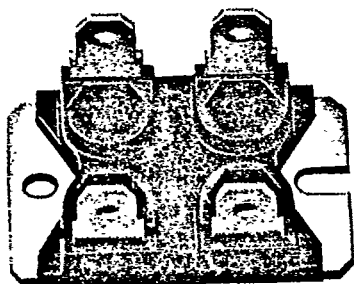
T-33-35

- Applications:
- Motor-control (380 V-mains)
 - UPS (Uninterruptible power supplies)
 - High power SMPS (≥ 1000 W)
 - Battery chargers
 - Welding equipments
 - Inductive heating equipment

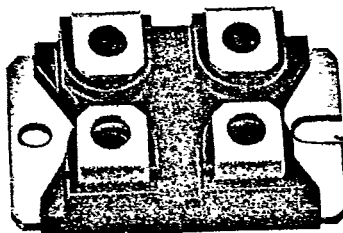
Features:

- High reverse voltage
- Short switching times
- Very fast C-E-free-wheel diode
- Base 1 and base 2 connectable
- Triple diffusion technique
- Glass passivation

Case variations

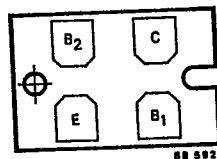
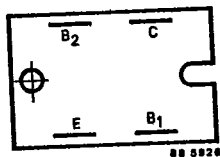
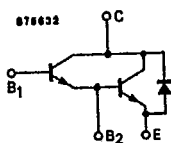


TFK 5070 D



TFK 5070 DA

Terminal connections

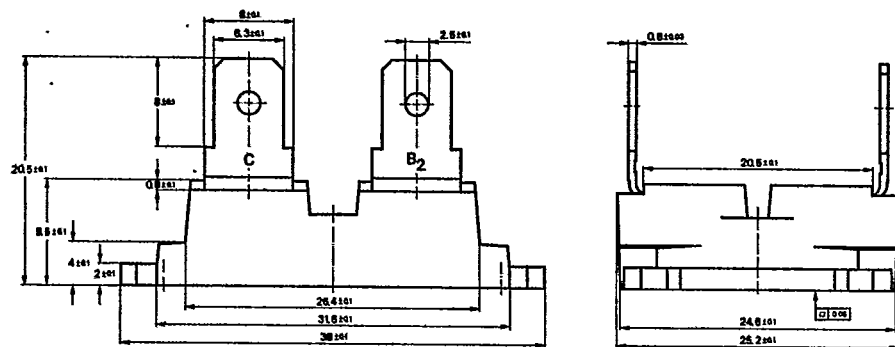


T1.2/1453.0888 E

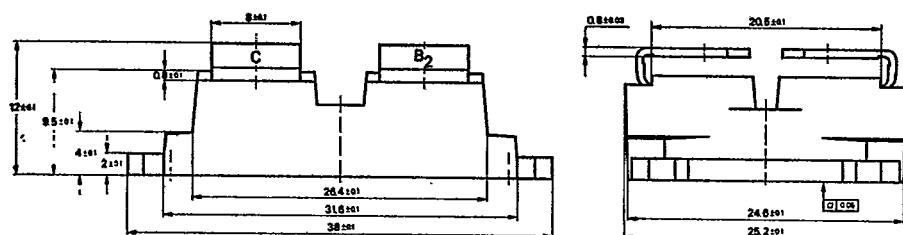
TFK 5070 D

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Dimensions in mm



TFK 5070 D



TFK 5070 DA

Plastic case

Weight max. 30.0 g

282 2803

D-12

TFK 5070 D

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Absolute maximum ratings

Collector-emitter voltage	V_{CEO}	700	V
	V_{CES}	1000	V
Emitter-base voltage	V_{EBO}	7	V
Collector current	I_C	30	A
Collector peak current	I_{CM}	50	A
Base current	I_B	4	A
Base peak current	I_{BM}	8	A
Total power dissipation	P_{tot}	150	W
$T_{case} = 25^\circ\text{C}$		150	$^\circ\text{C}$
Junction temperature	T_J	-40...+150	$^\circ\text{C}$
Storage temperature range	T_{stg}		V
Insulation voltage	V_{is}	2500	V

Maximum thermal resistances

Junction case		0.83	K/W
Power transistor	R_{thJC}	1.8	K/W
Free-wheel diode	R_{thJC}		

Characteristics

 $T_{case} = 25^\circ\text{C}$, unless otherwise specified

Collector cut-off current

 $V_{CE} = 1000\text{ V}, R_1 = 270\ \Omega, R_2 = 100\ \Omega$ $V_{CE} = 1000\text{ V}, R_1 = 27\ \Omega, R_2 = 10\ \Omega$ $T_{case} = 100^\circ\text{C}$ $V_{CE} = 1000\text{ V}, R_1 = 270\ \Omega, R_2 = 100\ \Omega$ $V_{CE} = 1000\text{ V}, R_1 = 27\ \Omega, R_2 = 10\ \Omega$

Emitter cut-off current

 $V_{EB} = 5\text{ V}$ T_1, T_2

Collector-emitter breakdown voltage

 $I_C = 750\text{ mA}, L = 125\text{ mH}$ $I_C = 1\text{ mA}, R_1 = 270\ \Omega, R_2 = 100\ \Omega$

Emitter-base breakdown voltage

 $I_E = 5\text{ mA}$ T_1, T_2

Collector saturation voltage

 $I_C = 25\text{ A}, I_B = 1.5\text{ A}, T_{case} = 100^\circ\text{C}$ $I_C = 18\text{ A}, I_B = 0.5\text{ A}, T_{case} = 125^\circ\text{C}$

DC forward current transfer ratio

 $V_{CE} = 2\text{ V}, I_C = 25\text{ A}$

	Min.	Typ.	Max.
I_{CER}			0.4 mA
I_{CER}			0.6 mA
I_{CER}			3.0 mA
I_{CER}			5.0 mA
I_{EBO}			1.0 mA
$V_{(BR)CEO}$	700		V
$V_{(BR)CER}$	1000		V
$V_{(BR)EBO}$	7		V
V_{CEsat}			2.5 V
V_{CEsat}			2.2 V
h_{FE}	17		

TFK 5070D

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	Min.	Typ.	Max.
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Collector-emitter working voltage

- $I_{CWoff} = 30 \text{ A}$, $I_{B1} = 1.4 \text{ A}$, $L = 12 \mu\text{H}$ - $V_{BB} = 7 \text{ V}$, $R_{BB} = 0.6 \Omega$, $V_S = 50 \text{ V}$

V_{CEW}	700		V
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Forward voltage of the diode

 $I_F = 25 \text{ A}$

V_F		1.9	V
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Switching characteristics

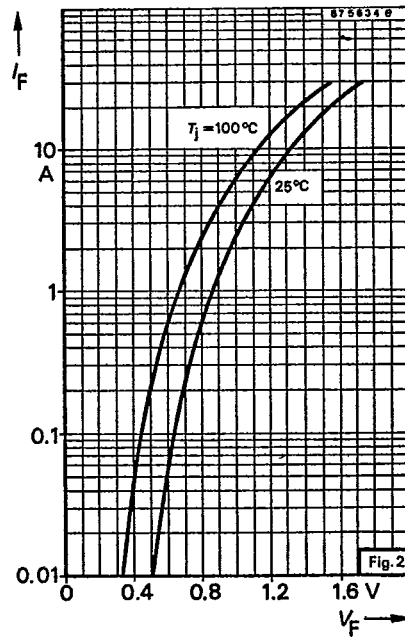
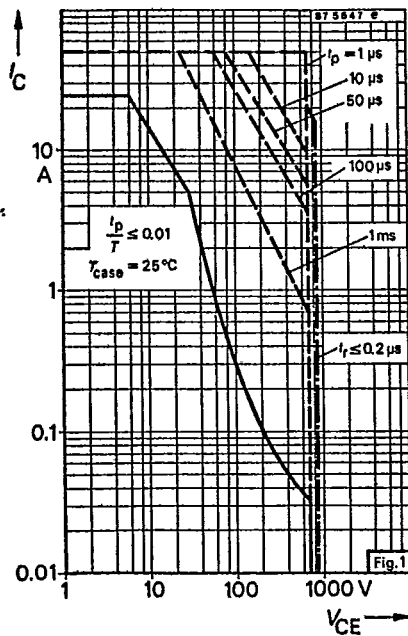
Inductive load, $T_{case} = 100^\circ\text{C}$ $I_C = 25 \text{ A}$, $I_{B1} = 1.5 \text{ A}$, $L = 0.6 \text{ mH}$, $V_{clamp} = 700 \text{ V}$ - $V_{BB} = 7 \text{ V}$, $R_{BB} = 0.6 \Omega$, $V_S = 300 \text{ V}$

Storage time

t_s		7.0	μs
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Fall time

t_f		0.6	μs
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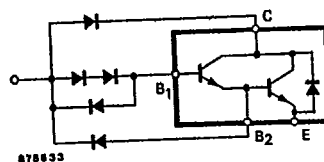
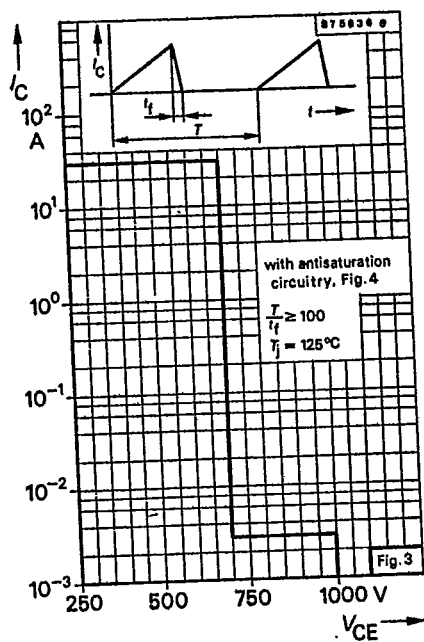
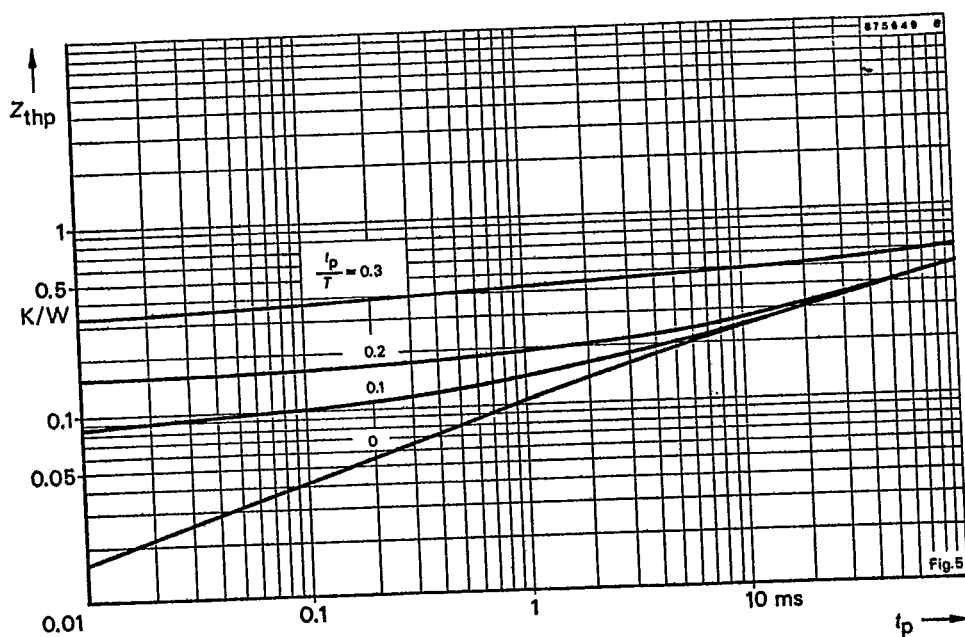


Fig. 4 Antisaturation voltage



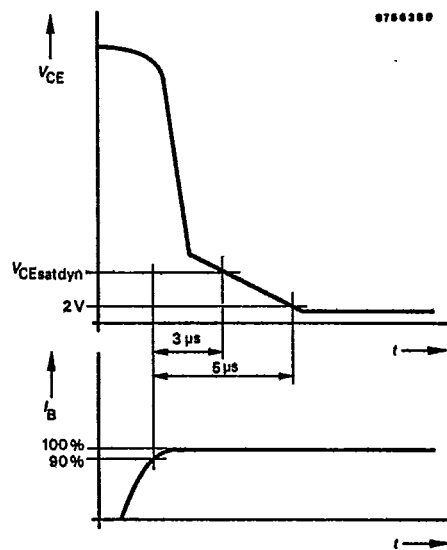
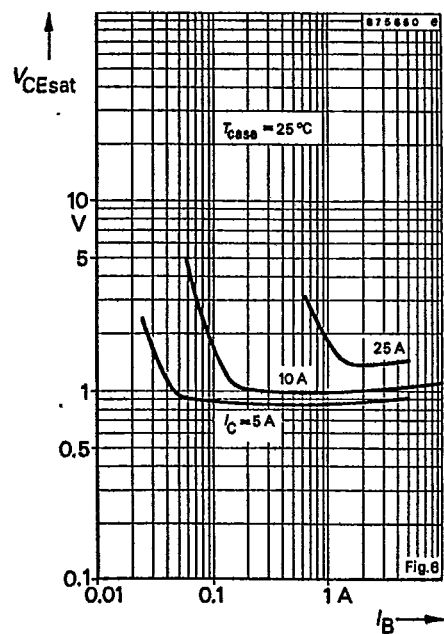
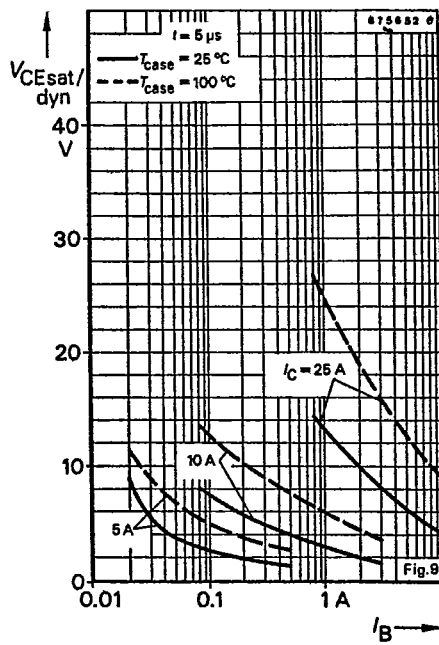
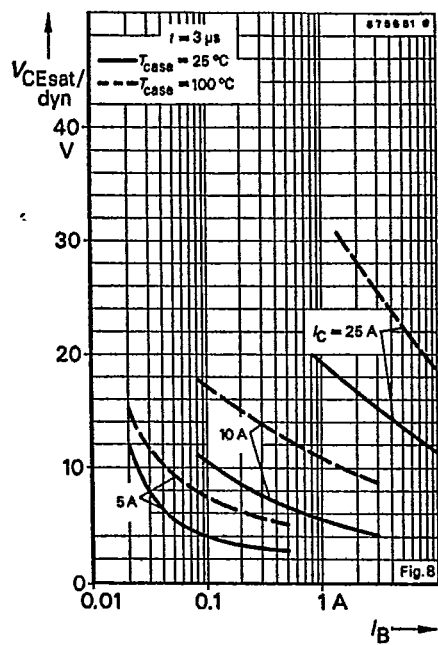
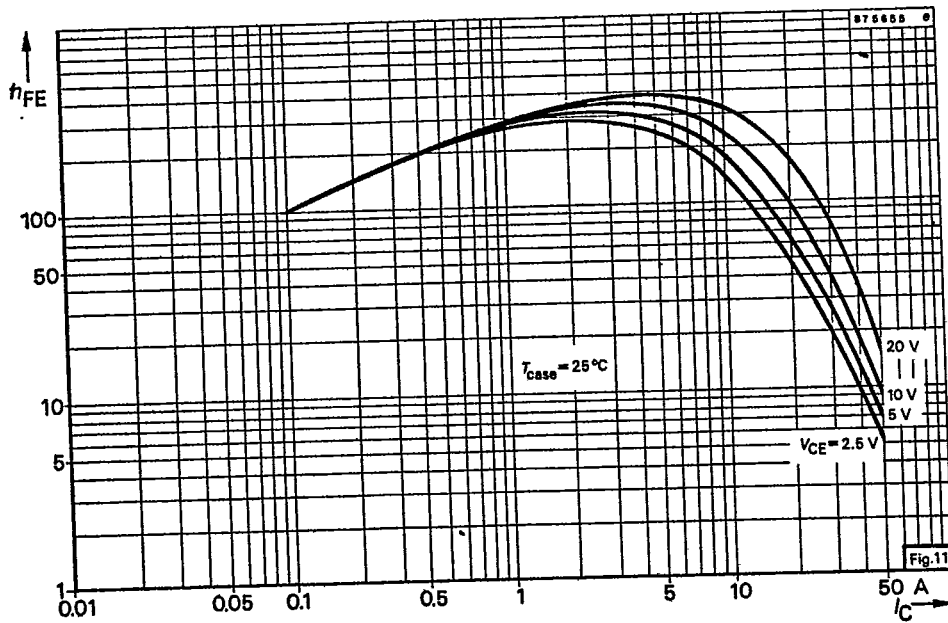
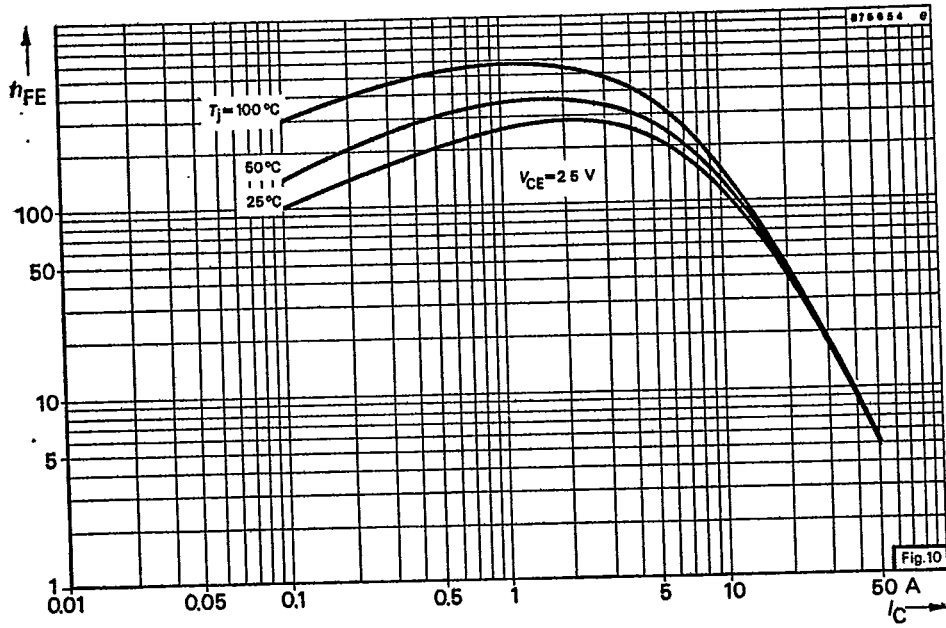


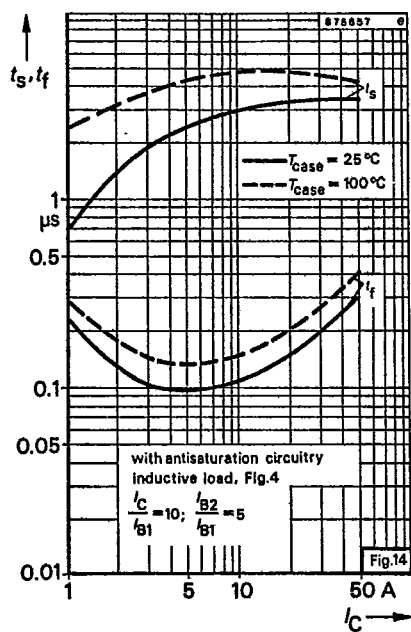
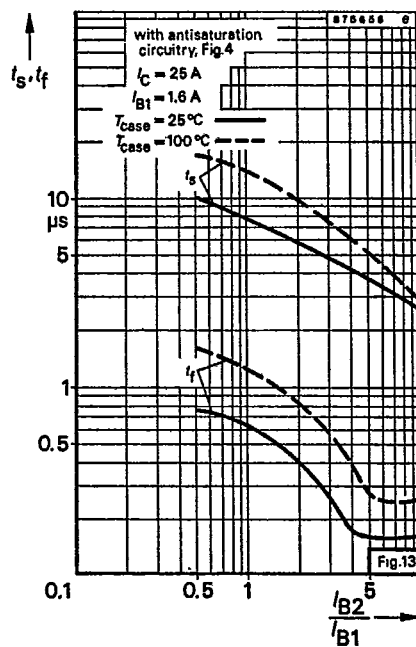
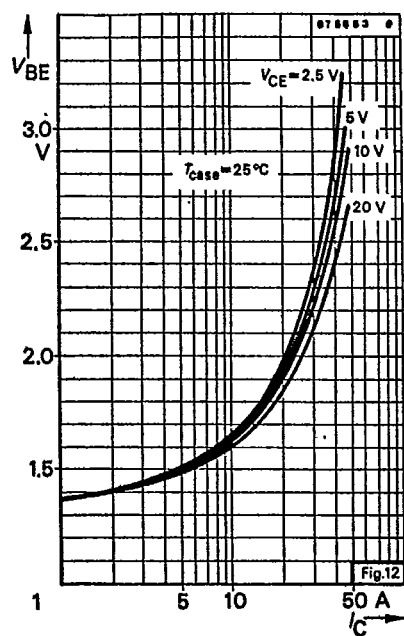
Fig. 7 $V_{CEsatdyn}$ -definition



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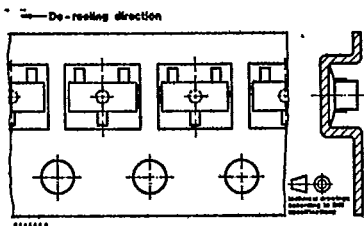


Fig. 7.4 Standard taped SOT 23

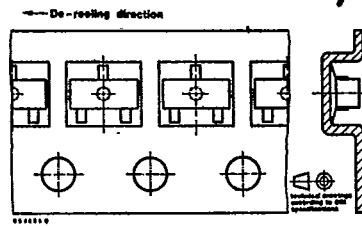


Fig. 7.6 Reverse taped SOT 23

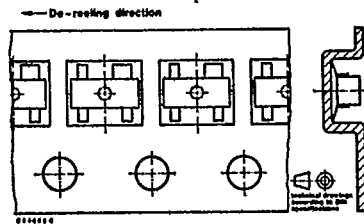


Fig. 7.5 Standard taped SOT 143

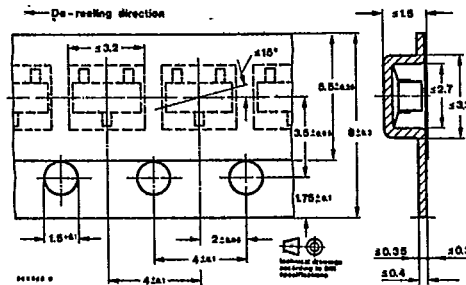


Fig. 7.7 Dimensions of tape in mm

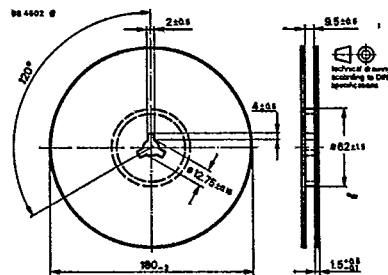


Fig. 7.8 Dimensions of reel in mm

b) Reverse taping

Designation is attached with code GS07 in case of reverse taping. Example for normal version transistors as reverse taped: BF 569 R-GS 07. Example for R-version transistors as reverse taping: BF 569 R-GS 07.

In case of reverse taping, the transistor orientation on the tape is shown in Fig. 6. Regarding MOF-FET and MES-FET devices, reverse taping is at present not available.

8. Assessories

Number	Fig.	Designation	For case
119880	8.1.	Isolating washer thickness 60 µm	12A 3 DIN 41 869 JEDEC TO 126 (SOT 32)
564542	8.2.	Isolating washer thickness 50 µm	14A 3 DIN 41 869 JEDEC TO 220 (SOT 78)
912884	8.3	Isolating washer thickness 50 µm	15A 3 DIN 41 869 (TOP3) for clip mounting
191 131	8.4	Isolating washer thickness 50 µm	15A 3 DIN 41 869 (TOP3) for screw mounting
191 140	8.5	Mounting clip	15A 3 DIN 41 869 (TOP3)
569524	8.6	Isolating washer thickness 100 µm + 50 µm	3B 2 DIN 41 872 JEDEC TO 3 Devices with high reverse voltage