

FAST SWITCHING THYRISTOR **ATF744**

New design for induction heating power converters

Repetitive voltage up to
Mean forward current
Surge current

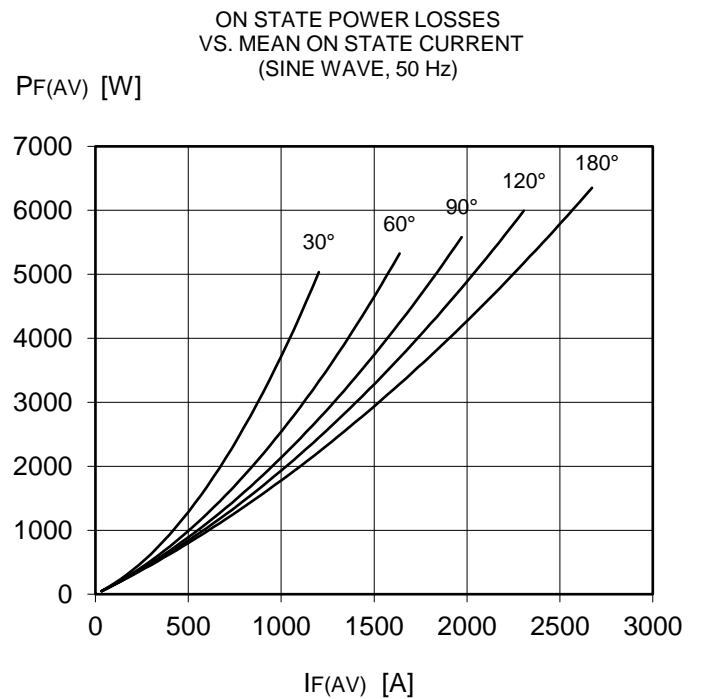
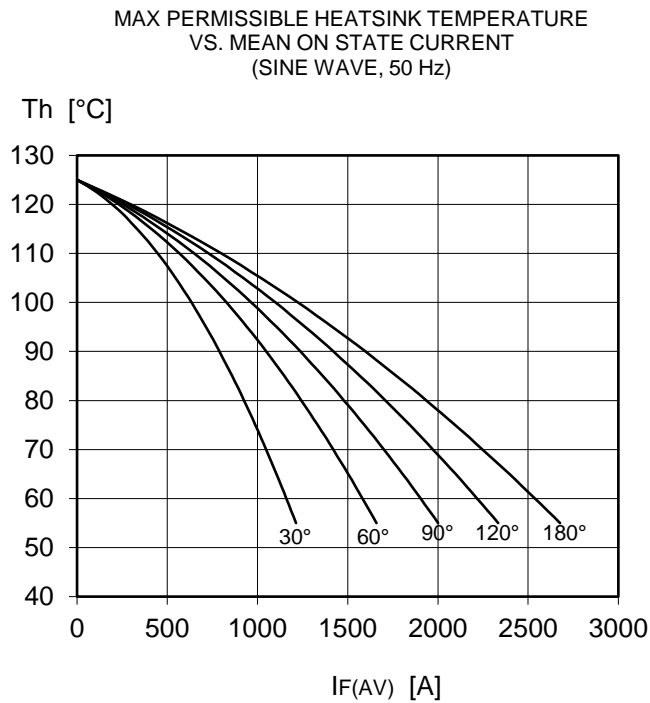
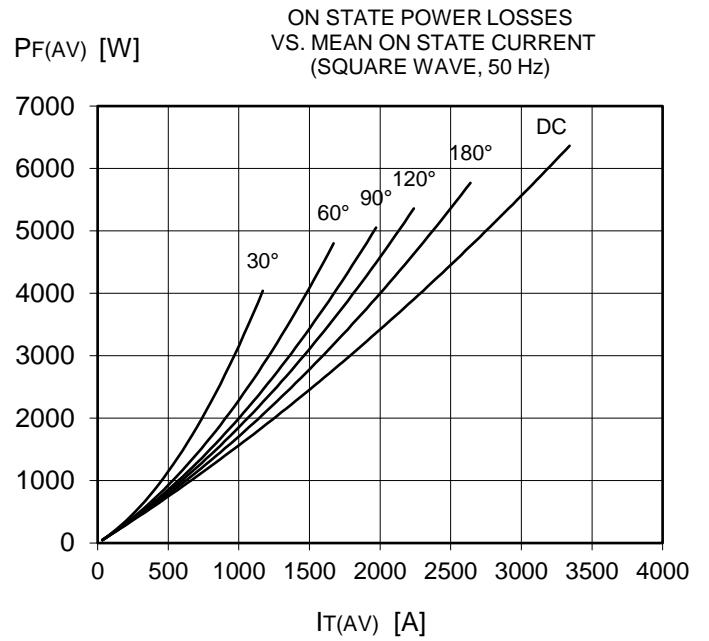
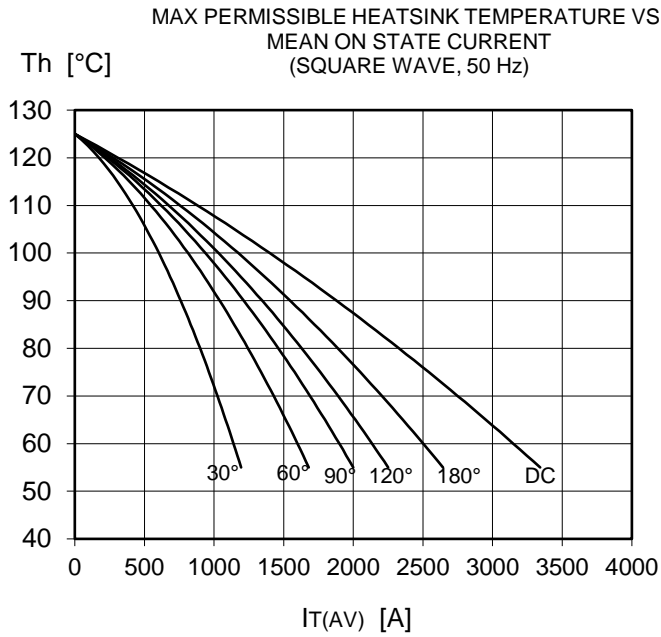
2200 V
2248 A
43 kA

FINAL SPECIFICATION

Nov. 17 - Issue: 0

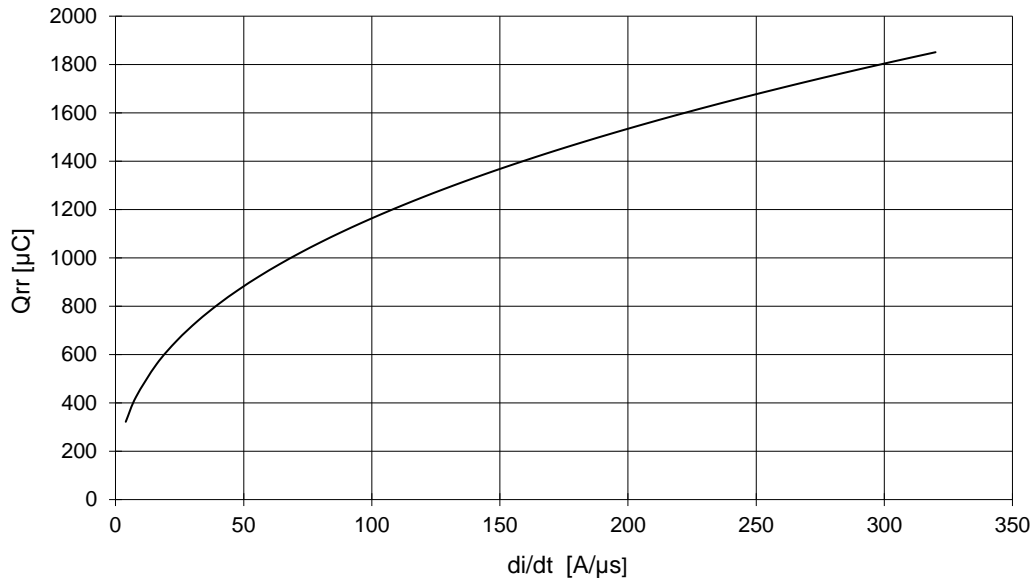
Symbol	Characteristic	Conditions	T _j [°C]	Value	Unit
BLOCKING					
V _{RRM}	Repetitive peak reverse voltage		125	2200	V
V _{RSM}	Non-repetitive peak reverse voltage		125	2300	V
V _{DRM}	Repetitive peak off-state voltage		125	2200	V
I _{RRM}	Repetitive peak reverse current	V=VRRM	125	200	mA
I _{DRM}	Repetitive peak off-state current	V=VDRM	125	200	mA
CONDUCTING					
I _{T(AV)}	Mean forward current	180° sin ,50 Hz, Th=55°C, double side cooled		2677	A
I _{T(AV)}	Mean forward current	180° sin ,50 Hz, Tc=80°C, double side cooled		2248	A
I _{TSM}	Surge forward current	Sine wave, 10 ms	125	43	kA
I ² t	I ² t	without reverse voltage		9245 x 10 ³	A ² s
V _T	On-state voltage	On-state current = 4000 A	125	2,00	V
V _{T(TO)}	Threshold voltage		125	1,42	V
r _T	On-state slope resistance		125	0,145	mohm
SWITCHING					
di/dt	Critical rate of rise of on-state current, mA/μs	From 67% VDRM ; IFG=2 A, tr ≤ 0,5 μs	125	1500	A/μs
dv/dt	Critical rate of rise of off-state voltage, mA/μs	Linear ramp up to 67% of VDRM; VGK=0	125	1000	V/μs
t _d	Gate controlled delay time, typical	VD=67% VDRM; IT=1500A; diT/dt=60 A/μs IFG=2 A, tr ≤ 0,5 μs	25	1,5	μs
t _q	Circuit commutated turn-off time, typical	dv/dt = 20 V/μs linear up to 67% VDRM		50	μs
Q _{rr}	Reverse recovery charge	di/dt = -20 A/μs, IT= 4000 A	125	600	μC
I _{rr}	Peak reverse recovery current	VR= 50 V		112	A
I _H	Holding current, typical	gate open circuit	25	250	mA
I _L	Latching current, typical		25		mA
GATE					
V _{GT}	Gate trigger voltage	VD=10 V	25	3,50	V
I _{GT}	Gate trigger current	VD=10 V	25	300	mA
V _{GD}	Non-trigger gate voltage, min.	VD=VDRM	125	0,25	V
V _{FGM}	Peak gate voltage (forward)			30	V
I _{FGM}	Peak gate current			10	A
V _{RGM}	Peak gate voltage (reverse)			5	V
P _{GM}	Peak gate power dissipation	Pulse width 100 μs		30	W
P _G	Average gate power dissipation			4	W
MOUNTING					
R _{th(j-h)}	Thermal impedance, DC	Junction to heatsink, double side cooled		11	°C/kW
R _{th(c-h)}	Thermal impedance	Case to heatsink, double side cooled		2	°C/kW
T _j	Operating junction temperature			-30 / 125	°C
F	Mounting force			40.0 / 50.0	kN
	Mass			1700	g
ORDERING INFORMATION : ATF744 S 22S					
standard specification			tq code		
VRRM/100			tq code		
D 10 μs	C 12 μs	B 15 μs	A 20 μs	L 25 μs	
M 30 μs	N 35 μs	P 40 μs	R 45 μs	S 50 μs	
T 60 μs	U 70 μs	W 80 μs	X 100μs	Y 150μs	

Dissipation characteristics



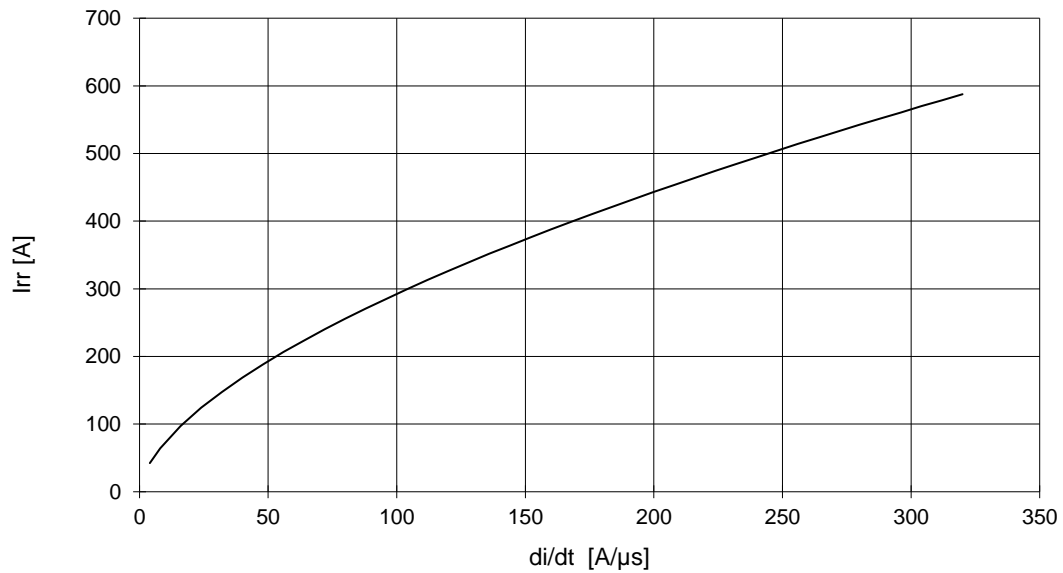
REVERSE RECOVERY CHARGE

@ $T_j = 125\text{ }^\circ\text{C}$
 $I_T = 4000\text{ A}$



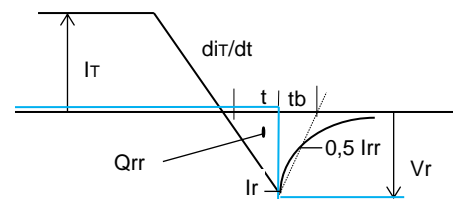
REVERSE RECOVERY CURRENT

@ $T_j = 125\text{ }^\circ\text{C}$
 $I_T = 4000\text{ A}$



$$t_a = I_{rr} / (di_T/dt) \quad t_b = t_{rr} - t_a$$

$$\text{Energy dissipation during recovery } E_{off} = V_r \cdot (Q_{rr} - I_{rr} \cdot t_a / 2)$$

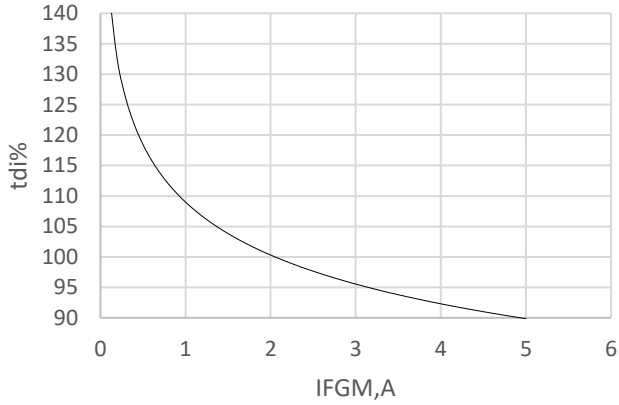


ATF744 FAST SWITCHING THYRISTOR

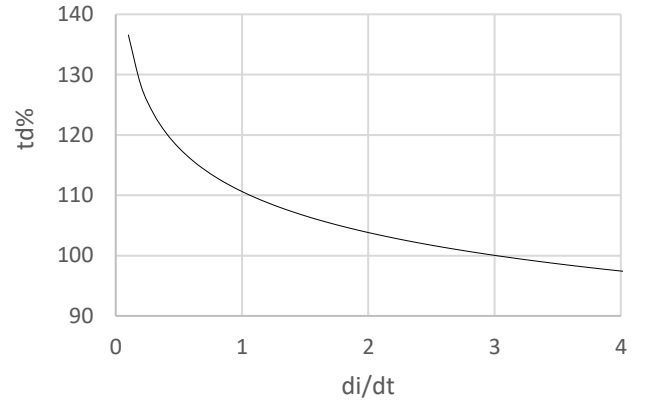


FINAL SPECIFICATION Nov. 17 - Issue: 0

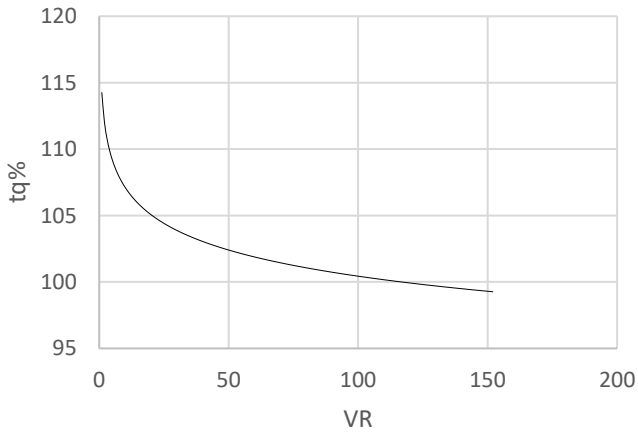
DELAY TIME VS PULSE OF GATE CURRENT



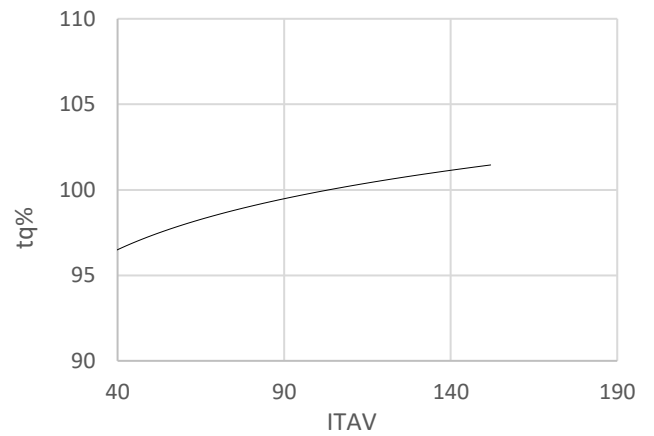
DELAY TIME VS RATE OF RISE PULSE OF GATE CURRENT



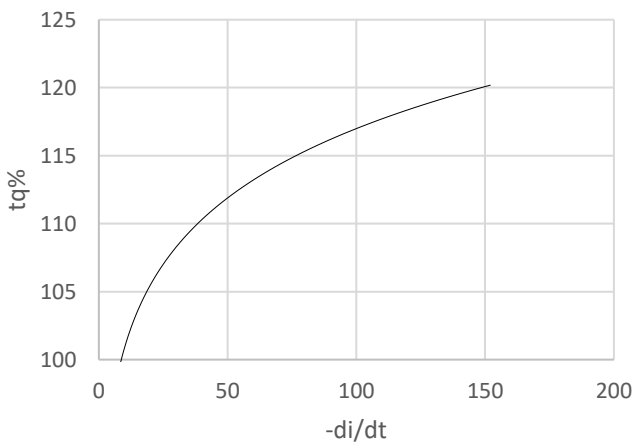
TURN OFF TIME VS REVERSE VOLTAGE



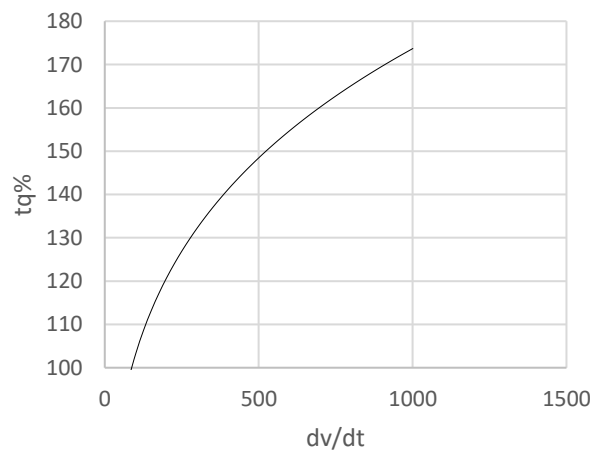
TURN OFF TIME VS ON-STATE CURRENT



TURN OFF TIME VS DECAY RATE OF ON-STATE CURRENT



TURN OFF TIME VS RATE OF RISE OF OFF-STATE CURRENT

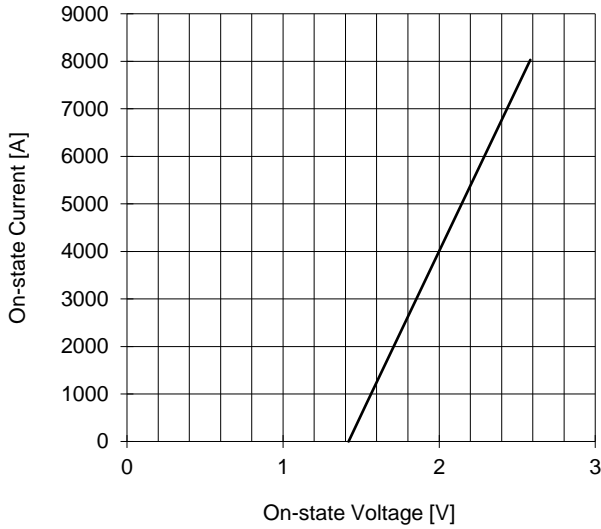


ATF744 FAST SWITCHING THYRISTOR

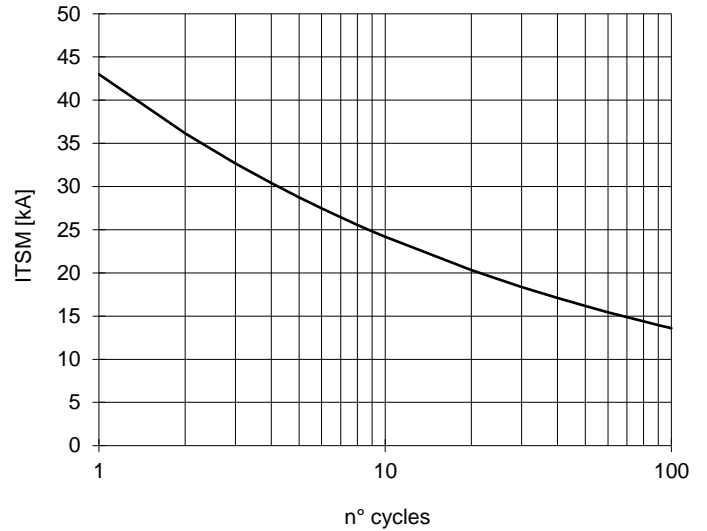


FINAL SPECIFICATION Nov. 17 - Issue: 0

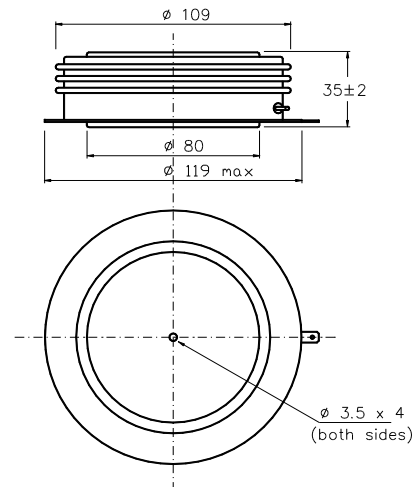
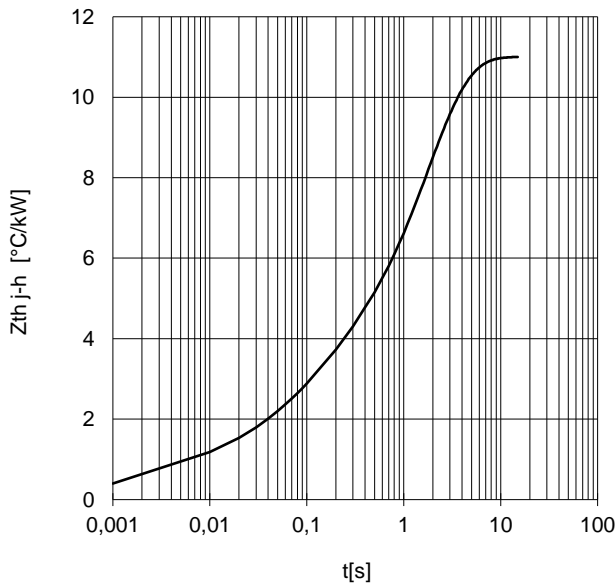
ON-STATE CHARACTERISTIC
T_j = 125 °C



SURGE CHARACTERISTIC
T_j = 125 °C



TRANSIENT THERMAL IMPEDANCE
DOUBLE SIDE COOLED



Dimensions
in mm



Cathode terminal type DIN 46244 - A 4.8 - 0.8

Gate terminal type AMP 60598 - 1

Distributed by



All the characteristics given in this data sheet are guaranteed only with uniform clamping force, cleaned and lubricated heatsink, surfaces with flatness < .03 mm and roughness < 2 μm.

In the interest of product improvement POSEICO SpA reserves the right to change any data given in this data sheet at any time without previous notice.

If not stated otherwise the maximum value of ratings (symbols over shaded background) and characteristics is reported.