

FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCT CHARACTERISTICS

$I_{F(AV)}$	8 A
V_{RRM}	400 V
$V_F(\text{max})$	1.4 V
$t_{rr}(\text{max})$	35 ns

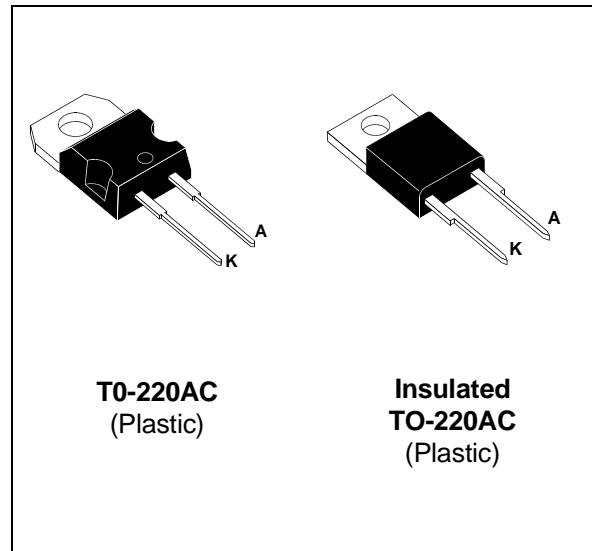
FEATURES AND BENEFITS

- VERY LOW REVERSE RECOVERY TIME
- VERY LOW SWITCHING LOSSES
- LOW NOISE TURN-OFF SWITCHING
- INSULATED PACKAGE: TO-220AC
Insulation voltage: 2500 V_{RMS}
Capacitance = 7 pF

DESCRIPTION

This single rectifier is suited for Switch Mode Power Supplies and other power converters.

This device is intended to free-wheeling function in converters and motor control circuits.



ABSOLUTE RATINGS (limiting values)

Symbol	Parameter		Value	Unit	
V_{RRM}	Repetitive peak reverse voltage		400	V	
I_{FRM}	Repetitive peak forward current	$t_p=5 \mu s$ $F=5kHz$	200	A	
$I_{F(RMS)}$	RMS forward current		16	A	
$I_{F(AV)}$	Average forward current	TO-220AC	$T_c = 120^\circ C$ $\delta = 0.5$	8	A
		Insulated TO-220AC	$T_c = 105^\circ C$		
I_{FSM}	Surge non repetitive forward current	$t_p = 10 ms$ Sinusoidal	100	A	
T_{stg}	Storage temperature range		- 40 to + 150	$^\circ C$	
T_j	Maximum operating junction temperature		150	$^\circ C$	

BYT08P-400 / BYT08PI-400

THERMAL RESISTANCES

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Junction to case	TO-220AC	2.5
		Ins. TO-220AC	3.5

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _F *	Forward voltage drop	T _j = 25°C			1.5	V
		T _j = 100°C			1.4	
I _R **	Reverse leakage current	T _j = 25°C	V _R = V _{RRM}		15	μA
		T _j = 100°C			2.5	mA

Pulse test : * tp = 380 μs, δ < 2%

** tp = 5 ms, δ < 2%

To evaluate the conduction losses use the following equation:

$$P = 1.1 \times I_{F(AV)} + 0.024 I_{F(RMS)}^2$$

RECOVERY CHARACTERISTICS

Symbol	Test Conditions	Min.	Typ.	Max.	Unit
t _{rr}	T _j = 25°C			75	ns
	I _F = 1A V _R = 30V dI _F /dt = - 15A/μs I _F = 0.5A I _R = 1A I _{rr} = 0.25A			35	

TURN-OFF SWITCHING CHARACTERISTICS

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t _{IRM}	Maximum reverse recovery time	dI _F /dt = - 32 A/μs		50	75	ns
		dI _F /dt = - 64 A/μs				
I _{RM}	Maximum reverse recovery current	dI _F /dt = - 32 A/μs	V _{CC} = 200 V I _F = 8 A L _p ≤ 0.05 μH T _j = 100°C (see fig. 13)	2.8		A
		dI _F /dt = - 64 A/μs				
$C = \frac{V_{RP}}{V_{CC}}$	Turn-off overvoltage coefficient	T _j = 100°C V _{CC} = 60V I _F = I _{F(AV)} dI _F /dt = - 30A/μs L _p = 1μH		3.3		/

Fig. 1: Average forward power dissipation versus average forward current .

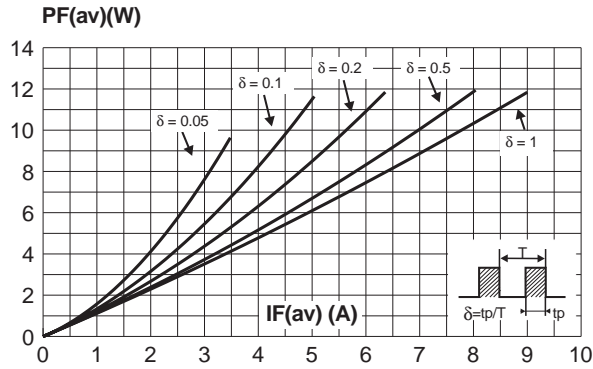


Fig. 2: Peak current versus form factor.

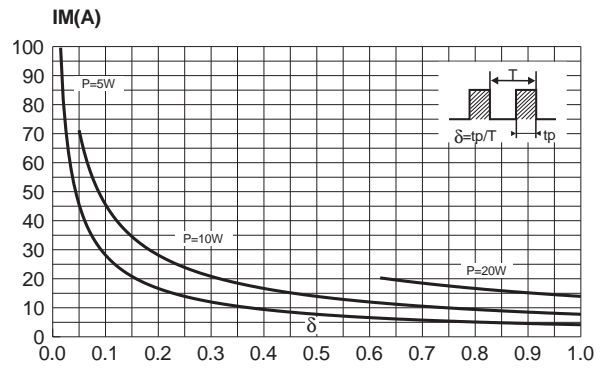


Fig. 3: Average forward current versus ambient temperature ($\delta=0.5$).

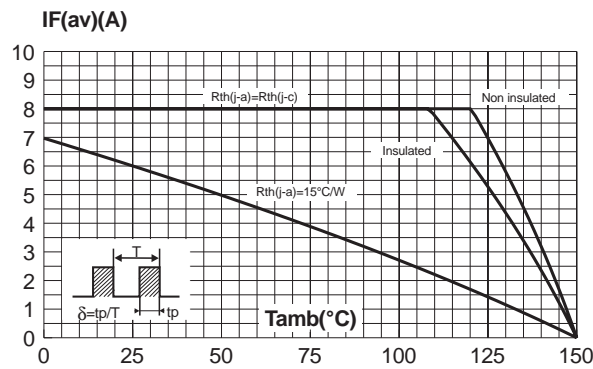


Fig. 4-1: Non repetitive surge peak forward current versus overload duration (TO-220AC).

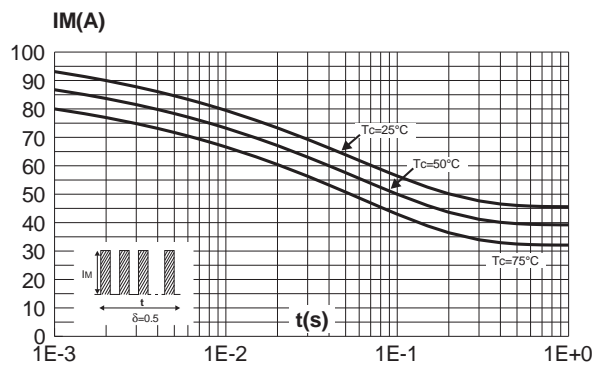


Fig. 4-2: Non repetitive surge peak forward current versus overload duration (insulated TO-220AC).

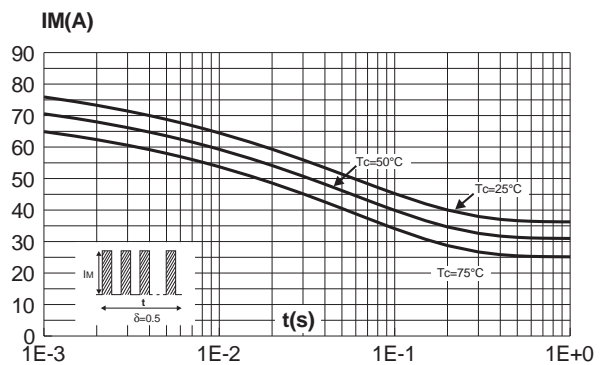


Fig. 5: Relative variation of thermal impedance junction to case versus pulse duration.

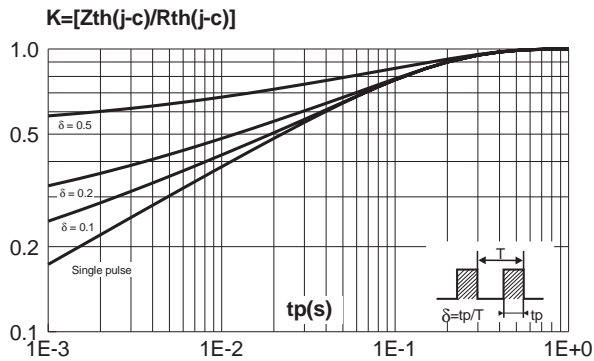


Fig. 7: Junction capacitance versus reverse voltage applied (typical values, per diode).

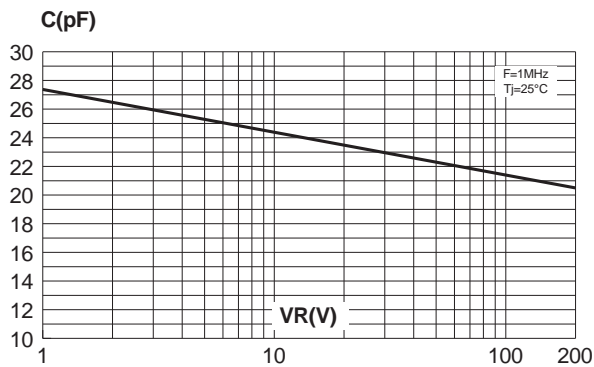


Fig. 9: Recovery current versus dI_F/dt (per diode).

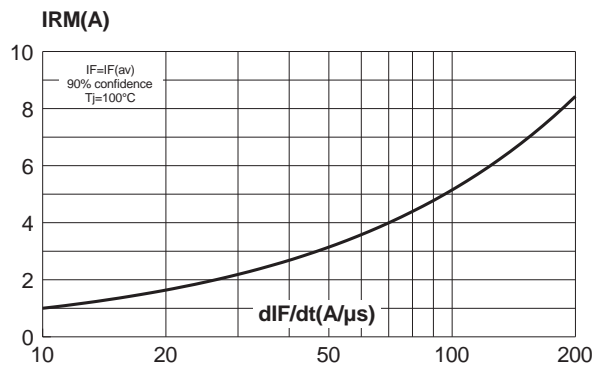


Fig. 6: Forward voltage drop versus forward current (maximum values, per diode).

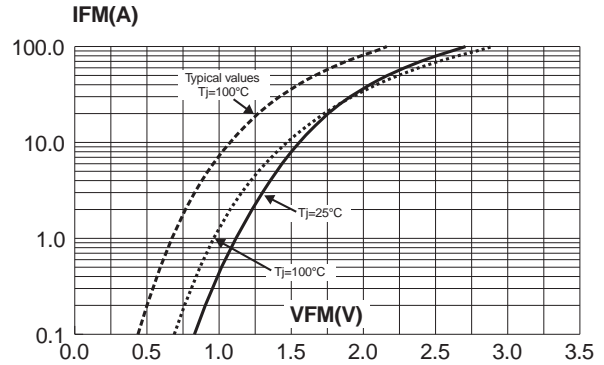


Fig. 8: Recovery charges versus dI_F/dt (per diode).

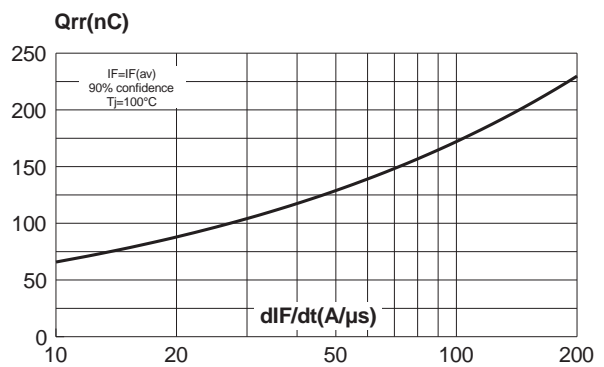


Fig. 10: Transient peak forward voltage versus dI_F/dt (per diode)

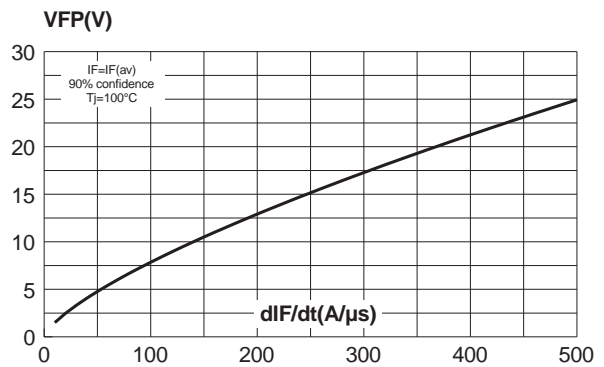


Fig. 11: Forward recovery time versus dI_F/dt (per diode)

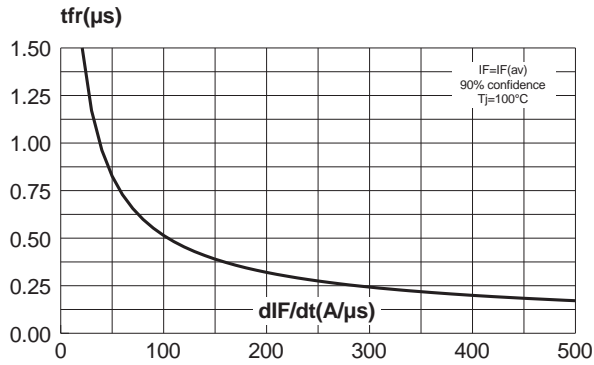


Fig. 12: Dynamic parameters versus junction temperature.

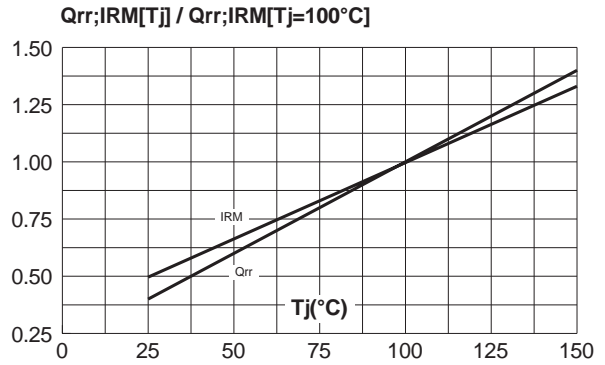


Fig. 13: Turn-off switching characteristics (without series inductance).

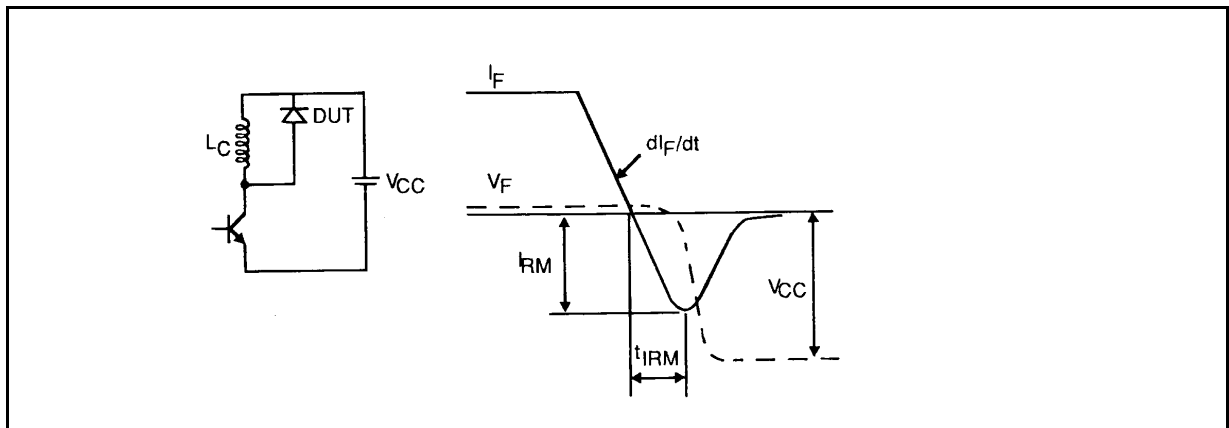
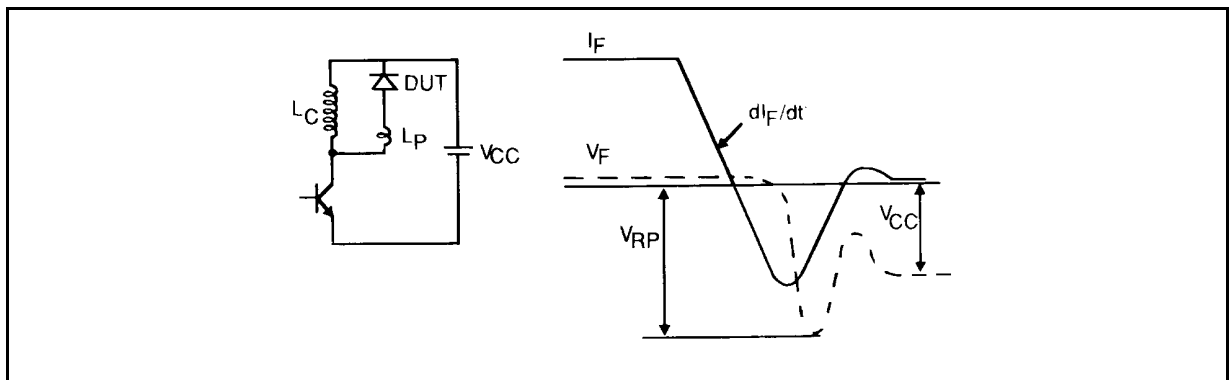
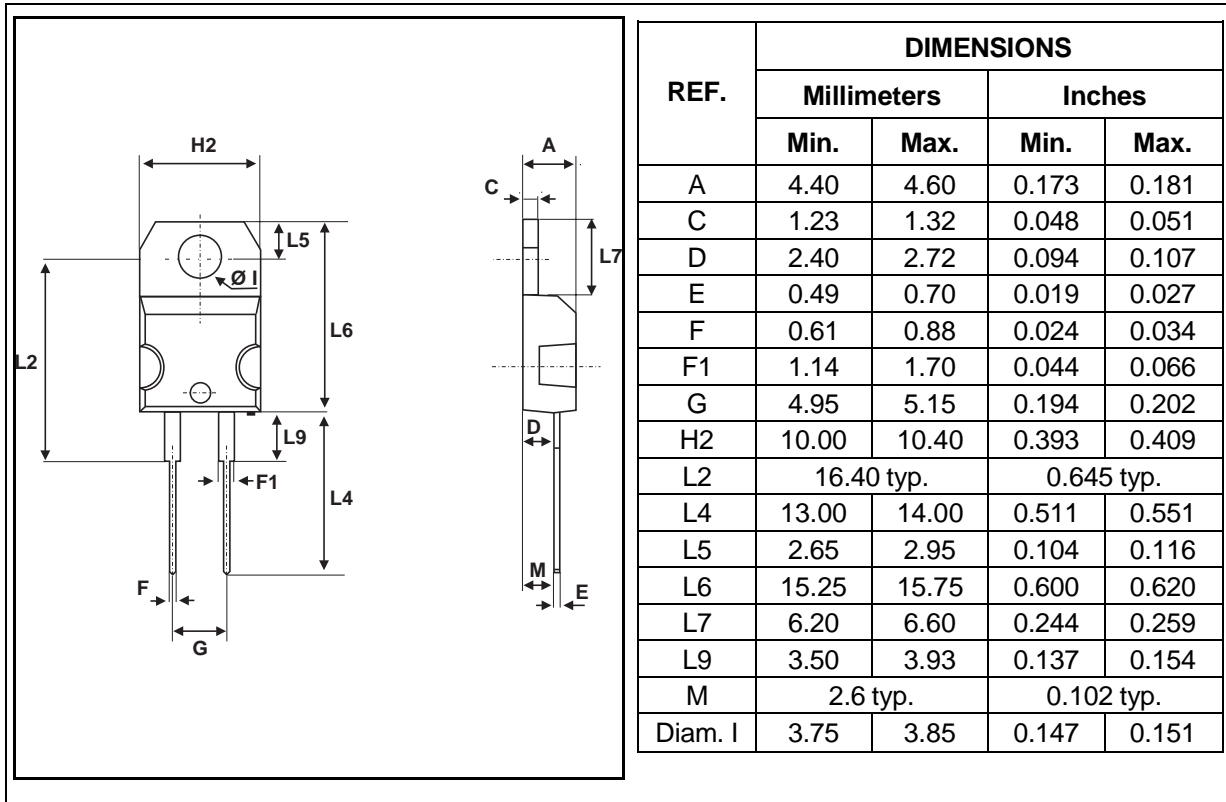


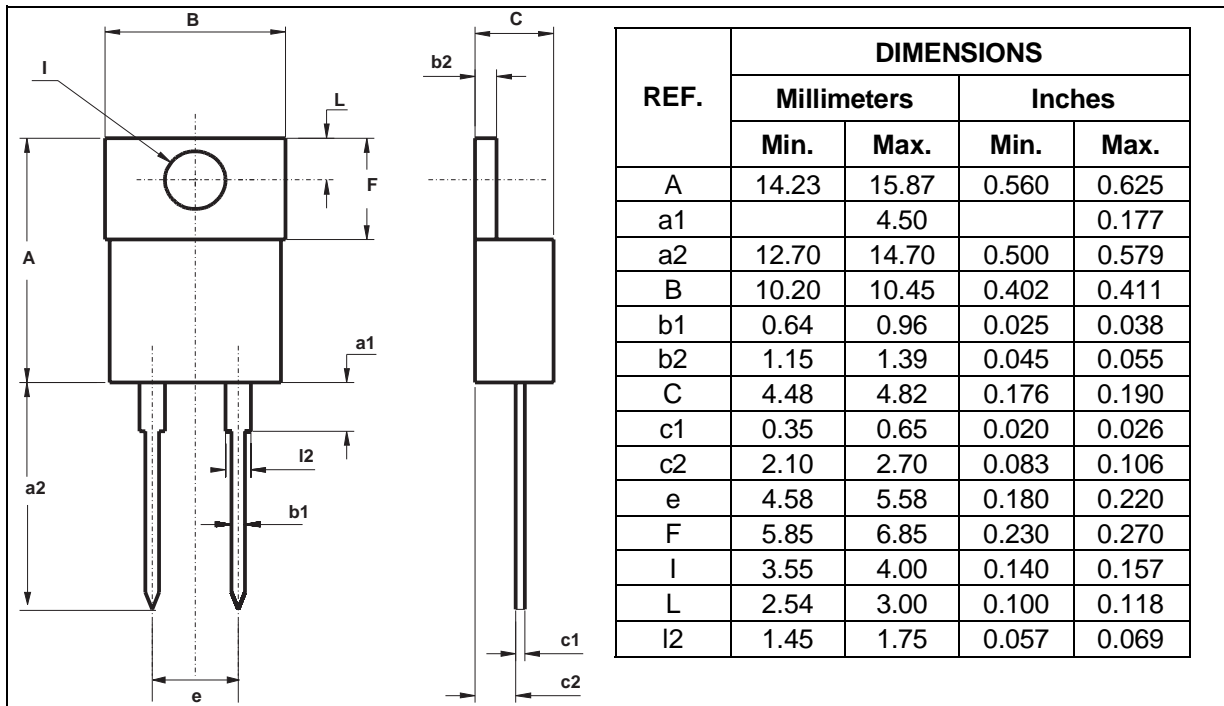
Fig. 14: Turn-off switching characteristics (with series inductance).



PACKAGE MECHANICAL DATA
TO-220AC



PACKAGE MECHANICAL DATA
TO-220AC Insulated



Ordering type	Marking	Package	Weight	Base qty	Delivery mode
BYT08P-400	BYT08P-400	TO-220AC	1.86 g.	50	Tube
BYT08PI-400	BYT08PI-400	Insulated TO-220AC	1.86 g.	50	Tube

- Cooling method: by conduction (C)
- Recommended torque value: 0.8 N.m.
- Maximum torque value: 1.0 N.m.
- Epoxy meets UL94,V0

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