

ULTRA-FAST RECOVERY RECTIFIER DIODES

MAIN PRODUCTS CHARACTERISTICS

$I_{F(AV)}$	5 A
V_{RRM}	200 V
T_j (max)	150°C
V_F (max)	0.99 V
t_{rr} (max)	30 ns

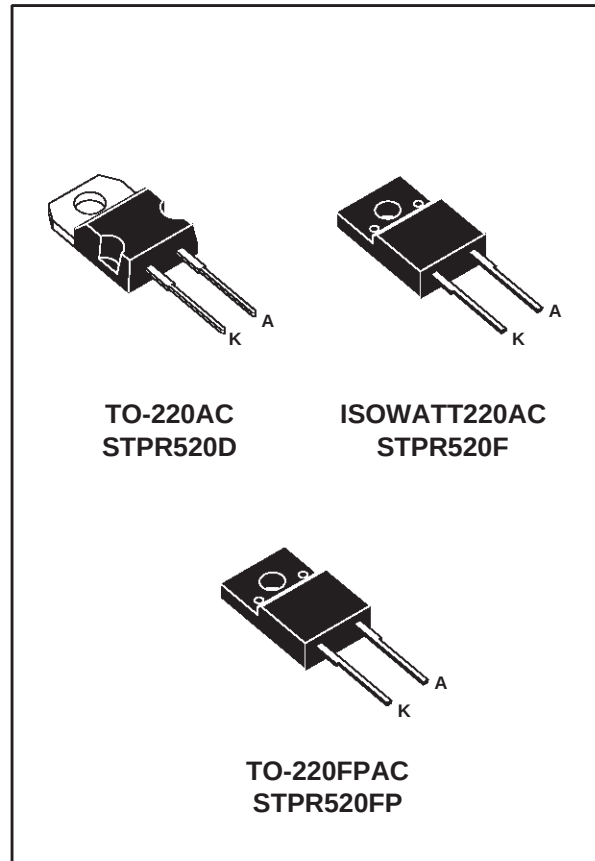
FEATURES

- Suited for SMPS
- Very low forward losses
- Negligible switching losses
- High surge current capability
- Insulated packages:
ISOWATT220AC / TO-220FPAC
Insulation voltage = 2000V DC
Capacitance = 12pF

DESCRIPTION

Low cost single chip rectifier suited for Switch Mode Power Supplies and high frequency DC to DC converters.

Packaged in TO-220AC, ISOWATT220AC and TO-220FPAC, this device is intended for use in low voltage, high frequency inverters, free wheeling and polarity protection applications.



Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage			200	V
$I_{F(RMS)}$	RMS forward current			10	A
$I_{F(AV)}$	Average forward current $\delta = 0.5$	TO-220AC	$T_c = 125^\circ\text{C}$	5	A
		ISOWATT220AC TO-220FPAC	$T_c = 115^\circ\text{C}$		
I_{FSM}	Surge non repetitive forward current		$T_p = 10$ ms Sinusoidal	50	A
T_{stg}	Storage temperature range			- 65 to + 150	°C
T_j	Maximum operating junction temperature			+ 150	

STPR520D/F/FP

THERMAL RESISTANCES

Symbol	Parameter		Value	Unit
$R_{th(j-c)}$	Junction to case	TO-220AC	4	°C/W
		ISOWATT220AC / TO-220FPAC	6	

STATIC ELECTRICAL CHARACTERISTICS

Symbol	Parameters	Test conditions		Min.	Typ.	Max.	Unit
I_R *	Reverse leakage current	$T_j = 25^\circ\text{C}$	$V_R = V_{RRM}$			50	μA
		$T_j = 100^\circ\text{C}$				0.5	mA
V_F **	Forward voltage drop	$T_j = 125^\circ\text{C}$	$I_F = 5\text{ A}$			0.99	V
		$T_j = 125^\circ\text{C}$	$I_F = 10\text{ A}$			1.20	
		$T_j = 25^\circ\text{C}$	$I_F = 10\text{ A}$			1.25	

Pulse test : * $t_p = 5\text{ ms}$, $\delta < 2\%$

** $t_p = 380\text{ }\mu\text{s}$, $\delta < 2\%$

To evaluate the conduction losses use the following equation :

$$P = 0.78 \times I_{F(AV)} + 0.042 \times I_F^2(RMS)$$

RECOVERY CHARACTERISTICS

Symbol	Test conditions			Min.	Typ.	Max.	Unit
t_{rr}	$T_j = 25^\circ\text{C}$	$I_F = 0.5\text{ A}$	$I_{rr} = 0.25\text{ A}$ $I_R = 1\text{ A}$			30	ns
t_{fr}	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$	$t_r = 10\text{ ns}$ $V_{FR} = 1.1 \times V_F$		20		
V_{FP}	$T_j = 25^\circ\text{C}$	$I_F = 1\text{ A}$	$t_r = 10\text{ ns}$		3		V

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

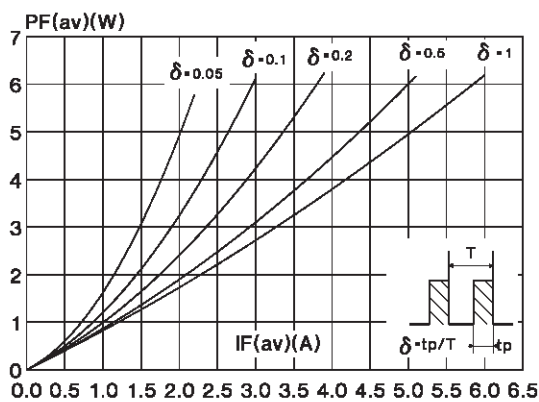


Fig. 2: Peak current versus form factor.

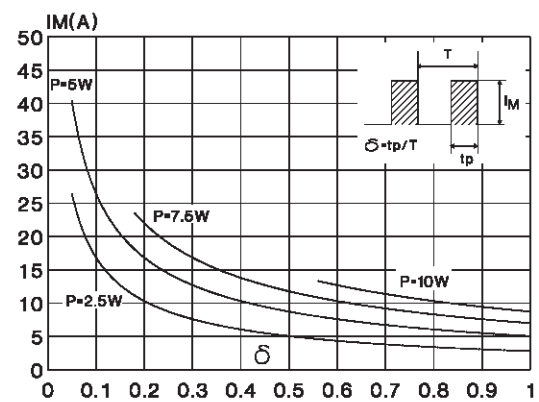


Fig. 3: Average current versus ambient temperature.

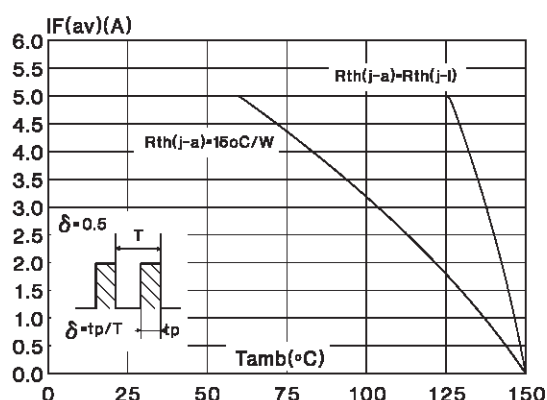


Fig. 4: Average current versus ambient temperature.

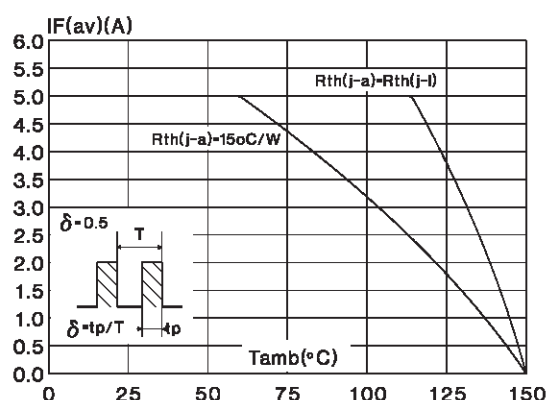


Fig. 5: Non repetitive surge peak forward current versus overload duration (maximum values) (TO-220AC).

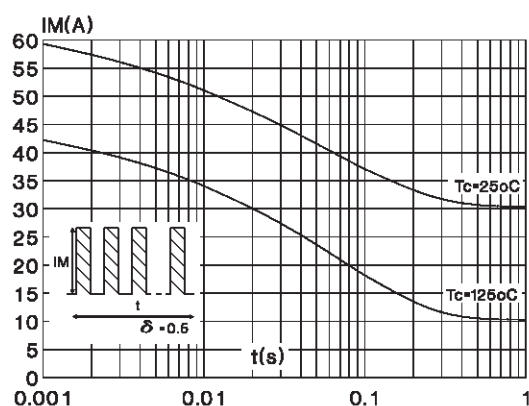


Fig. 6: Non repetitive surge peak forward current versus overload duration (maximum values) (ISOWATT220AC, TO-220FPAC).

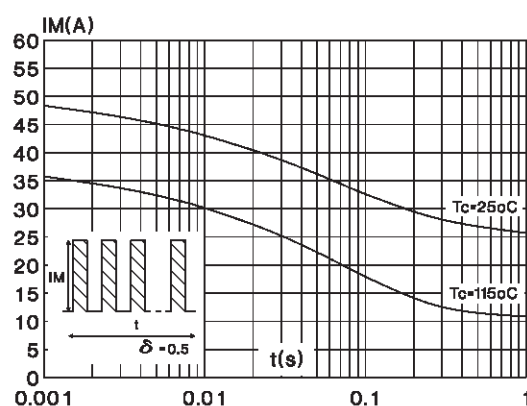


Fig. 7: Relative variation of thermal transient impedance junction to case versus pulse duration (TO-220AC).

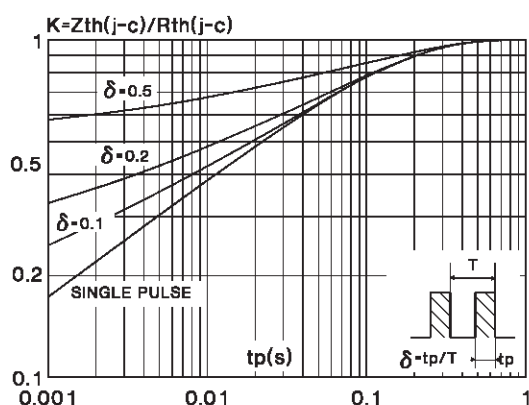


Fig. 8: Relative variation of thermal transient impedance junction to case versus pulse duration (ISOWATT220AC, TO-220FPAC).

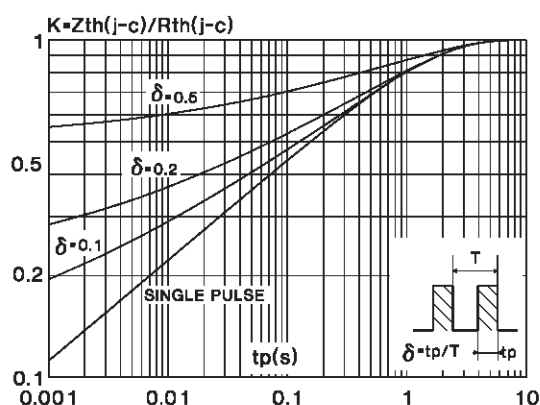


Fig. 9: Forward voltage drop versus forward current.

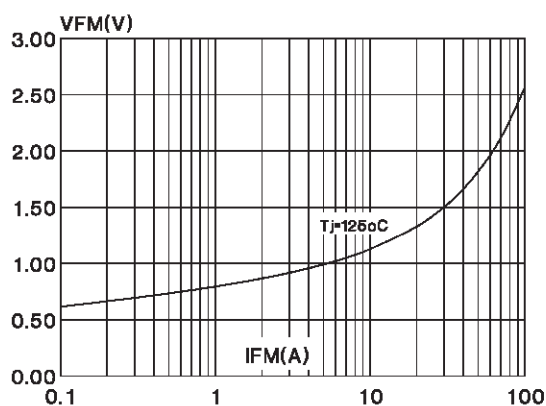


Fig. 10: Junction capacitance versus reverse voltage applied (typical values).

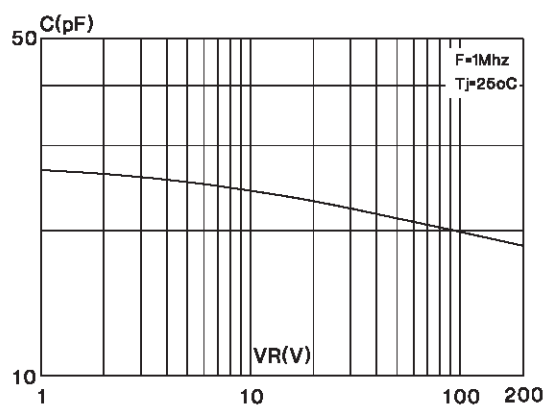


Fig. 11: Recovery charge versus dI_F/dt .

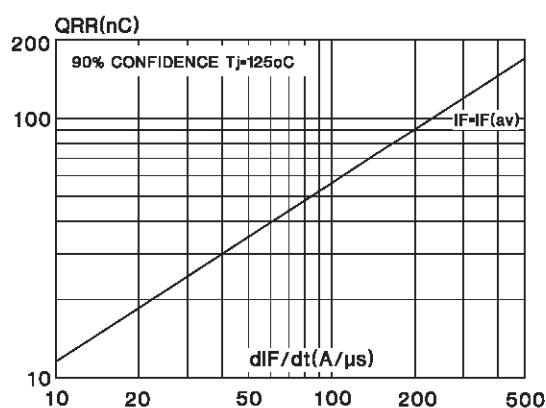


Fig. 12: Peak reverse current versus dI_F/dt .

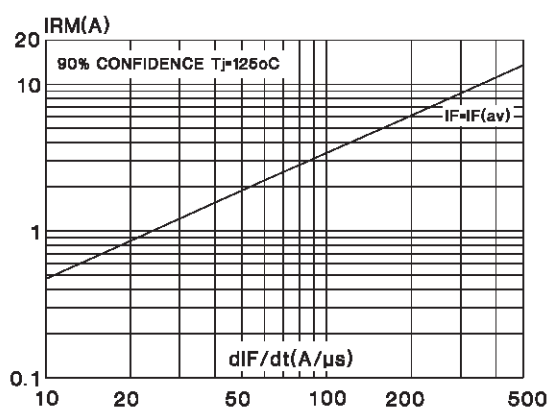
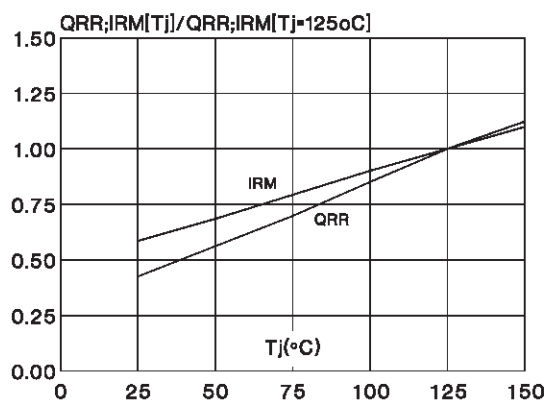
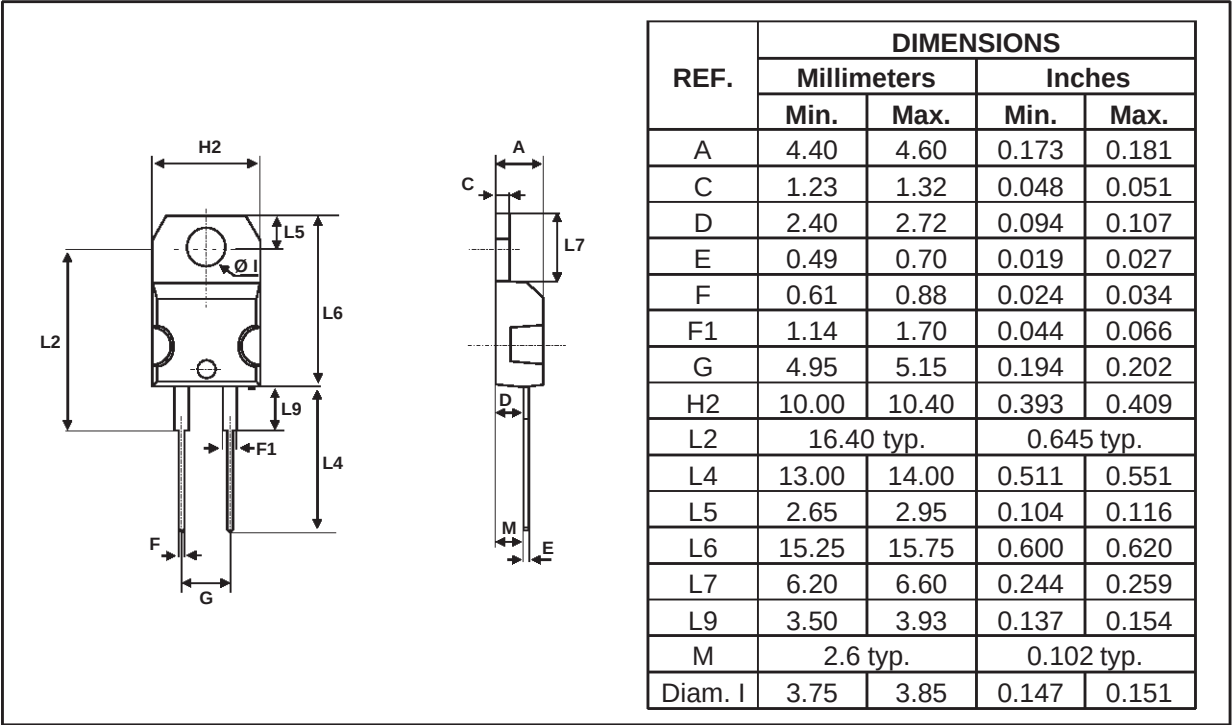


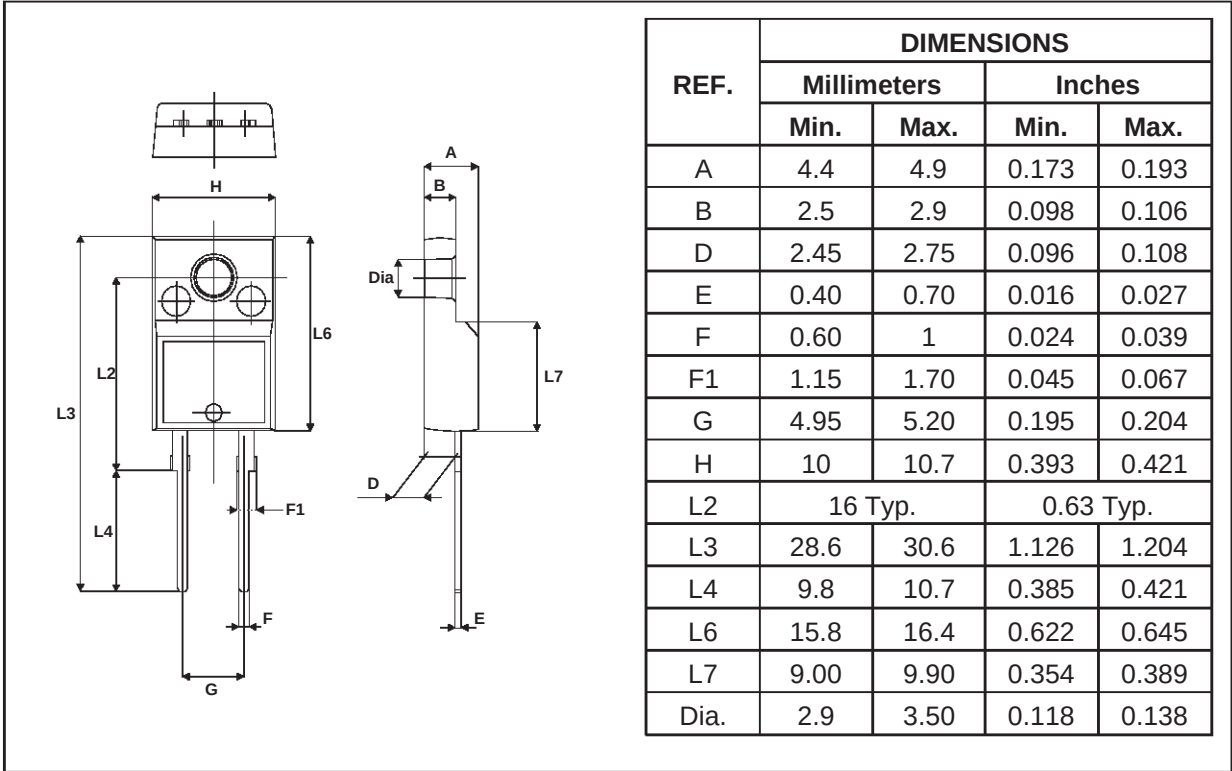
Fig. 13: Dynamic parameters versus junction temperature.



PACKAGE MECHANICAL DATA
TO-220AC

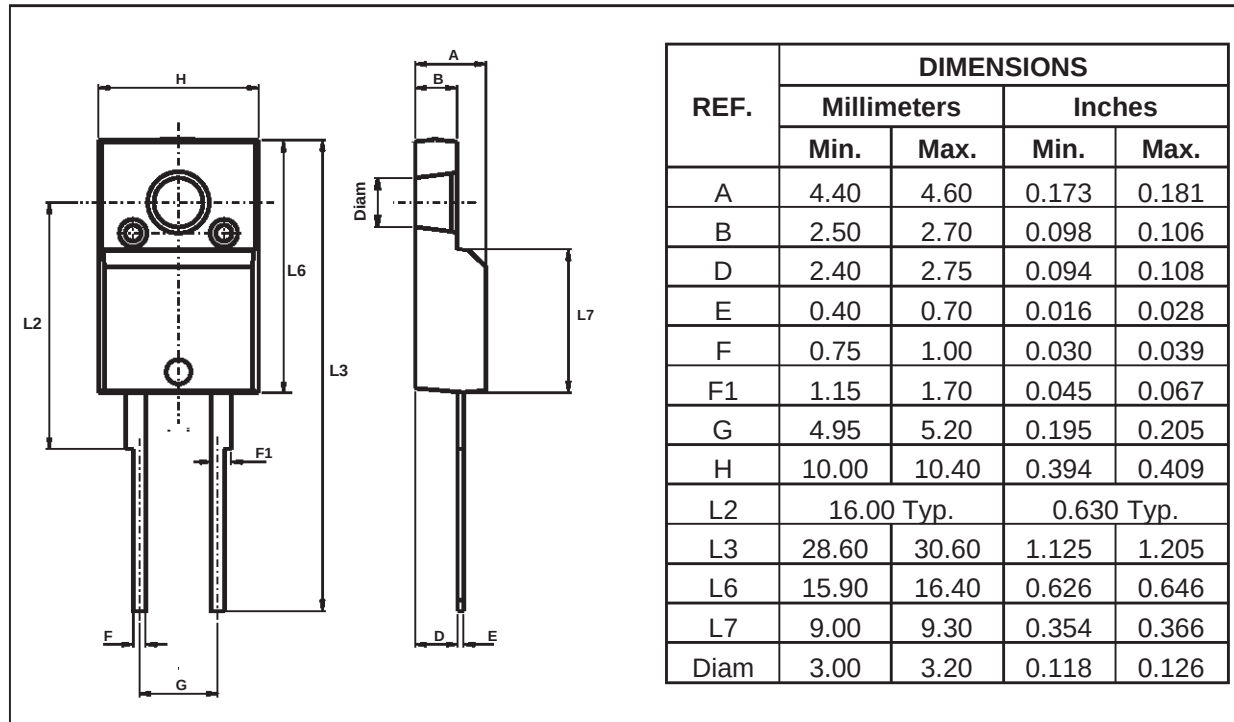


PACKAGE MECHANICAL DATA
TO-220FPAC



STPR520D/F/FP

PACKAGE MECHANICAL DATA ISOWATT220AC



- Cooling method: by conduction (C)
- Recommended torque value (ISOWATT220AC, TO-220FPAC): 0.55 nm
- Maximum torque value (ISOWATT220AC, TO-220FPAC): 0.7 Nm
- Recommended torque value (TO-220AC): 0.8 Nm
- Maximum torque value (TO-220AC): 1.0 Nm
- Epoxy meets UL94, V0

Type	Marking	Package	Weight	Base Qty	Delivery mode
STPR520D	STPR520D	TO-220AC	2.3 g	50	Tube
STPR520F	STPR520F	ISOWATT220AC	2 g	50	Tube
STPR520FP	STPR520FP	TO-220FPAC	1.8 g	50	Tube

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