



Datasheet

0.8A 150KHz 100V Step-Down DC-DC Converter

XL7015

Features

Maximum input voltage 100V

describe

XL7015 is a high efficiency, high voltage step-down DC-DC

Output voltage adjustable from 1.25V to 20V

The converter has a fixed switching frequency of 150KHz and can provide the highest

Maximum duty cycle 90%

0.8A output current capability, low ripple, excellent linear regulation

Minimum voltage drop 2V

The XL7015 has a built-in fixed frequency oscillator.

Fixed 150KHz switching frequency

The device and frequency compensation circuit simplify the circuit design.

Maximum 0.8A output current

The PWM control loop can adjust the duty cycle from

48V input, 5V output recommended maximum output current 0.6A

Linear change between 0~90%. Built-in output over-current protection function

48V input, 15V output recommended maximum output current

Yes, when the output is short-circuited, the switching frequency drops from 150KHz to

0.4A

45KHz. The internal compensation module can reduce the number of external components

Built-in high voltage power transistor

quantity.

Efficiency up to 85%

Excellent line and load regulation

EN pin TTL shutdown function

Built-in over-temperature shutdown protection function

Built-in current limiting function

Built-in output short circuit protection function

TO252-5L package

application

Electric vehicle controller power supply

Communications



Figure 1. XL7015 package



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Pin Configuration

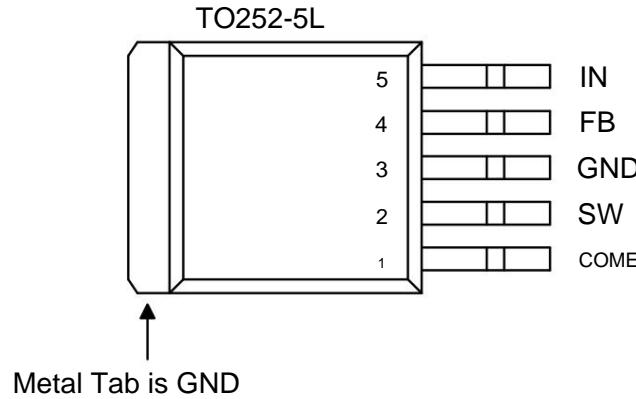


Figure 2. XL7015 pin configuration

Table 1. Pin Description

Pin Number	Pin name description	Power
1	COME	input pin, an electrolytic capacitor needs to be connected in parallel between VIN and GND to eliminate noise.
2	SW Power switch	output pin, SW is the switching node for output power.
3	GND Ground pin.	
4	FB	Feedback pin, through the external resistor divider network, detects the output voltage for adjustment. The test voltage is 1.25V.
5	EN is the enable	pin. It works at low level and shuts down at high level. It is at low level when it is left floating.



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Block Diagram

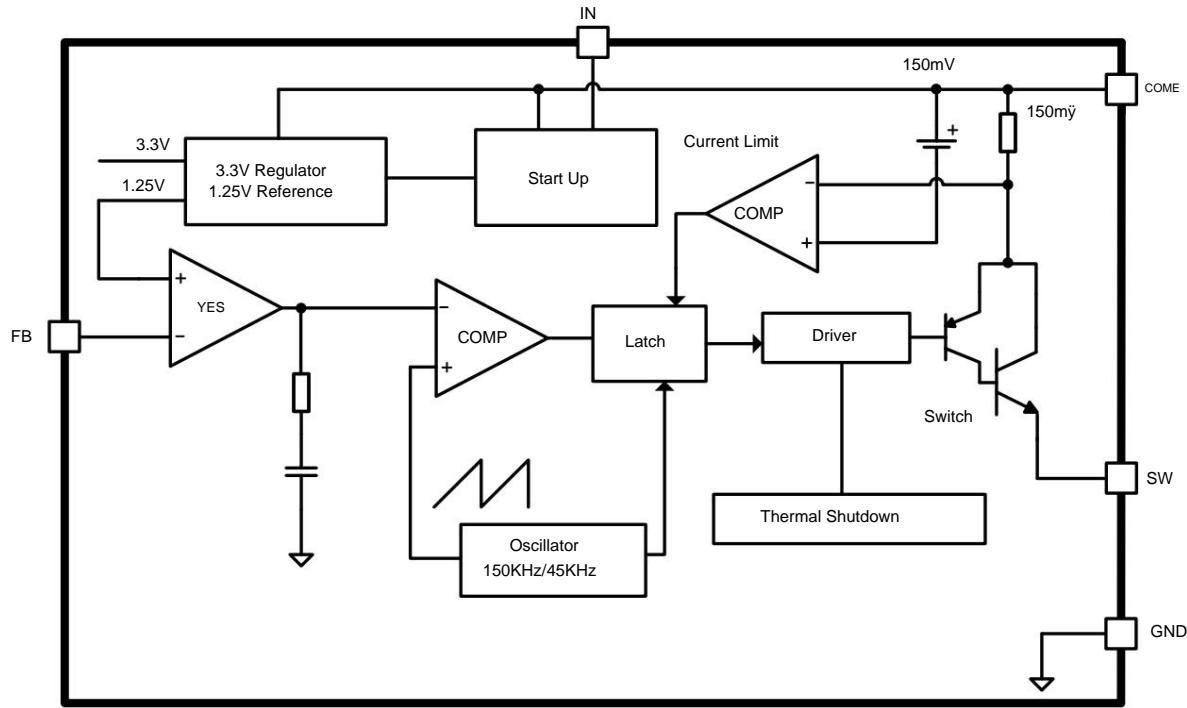


Figure 3. XL7015 block diagram

Typical Applications

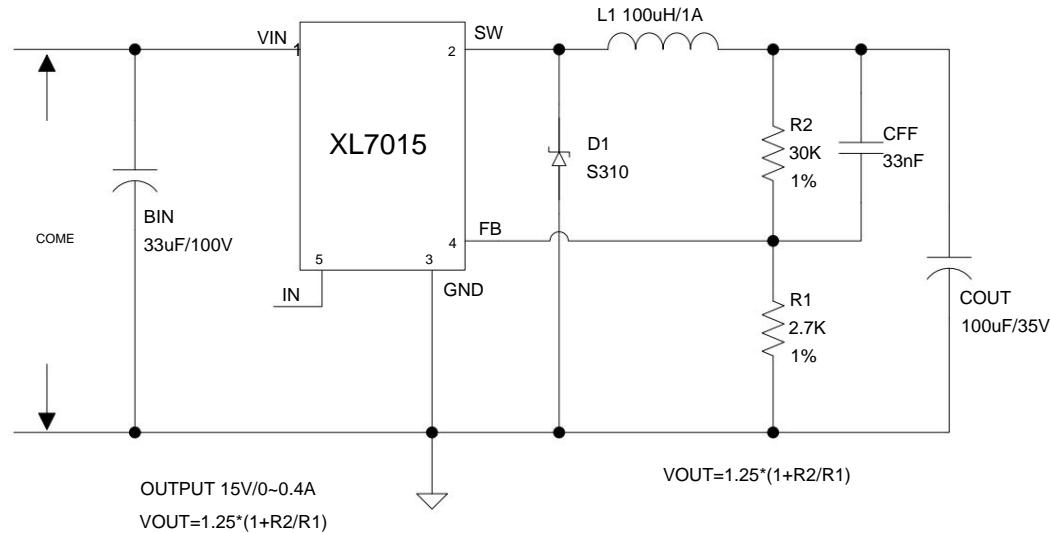


Figure 4. XL7015 system parameter measurement circuit



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Ordering Information

Product Model	Print Name	Packaging	Packaging Type
XL7015E1	XL7015E1	TO252-5L	2500pcs per roll

XLSEMI lead-free products with an "E1" suffix in the part number are RoHS compliant.

Absolute Maximum Ratings (Note 1)

parameter	symbol	value	unit
Input voltage	C _{in}	-0.3 to 100	mA
Feedback pin voltage	V _{FB}	-0.3 to 7	mA
Enable pin voltage	V _{EN}	-0.3 to 7	mA
Output switch pin voltage	V _{SW}	-0.3 to V _{in}	mA
Power consumption	P _D	Internal Limitations	mW
Thermal resistance (TO252-5L) (Junction to Ambient, No External Heat Sink)	R _{JA}	50	oC/W
Maximum Junction Temperature	T _J	-40 to 150	oC
Operating Junction Temperature	T _J	-40 to 125	oC
Storage temperature range	T _{STG}	-65 to 150	oC
Pin temperature (soldering 10 seconds)	T _{LEAD}	260	oC
ESD (Human Body Model)		>3000	mA

Note 1: Exceeding the absolute maximum ratings may cause permanent damage to the device. Only functional operation is possible under the above or other unspecified conditions.

Operating at absolute maximum rating conditions for extended periods may affect the life of the device.



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XL7015 Electrical Characteristics

Ta = 25°C unless otherwise specified.

Symbolic parameters	parameters	condition	Min	Typ	Max	Unit		
Figure 4 System parameter measurement circuit								
VFB	Feedback Voltage	Vin = 20V to 80V, Vout=15V Iload = 0.1A to 0.4A	1.225		1.25		1.275V	
or	efficiency	Vin=36V ,Vout=15V Iout=0.4A			86			%
or	efficiency	Vin=48V ,Vout=15V Iout=0.4A			83			%
or	efficiency	Vin=60V ,Vout=15V Iout=0.4A			81			%

Electrical characteristics (DC parameters)

Vin = 48V, GND = 0V, 33uF/100V capacitor is connected in parallel between Vin and GND; Iout = 200mA, Ta = 25°C;

He is arbitrary unless otherwise stated.

parameter	symbol	condition	Min	Typ	Max	Unit		
Input voltage	Com		5		80		In	
Shutdown current	IS	VEN=2V			85	200	a	
Quiescent supply current	Iq	VEN =0V, VFB=2V			2.5	5	m.a.	
Oscillation frequency	Dark		120	150	180	KHz		
Switching current limit	THE	VFB=0V		1			A	
EN pin threshold voltage	VEN	High (off)			1.6		In	
		Low (Open)			0.8			
EN pin input leakage current	THE	VEN=2.5V (off)			6	20	a	
	THE	VEN=0.5V (open)		1		10	a	
Saturation pressure drop	VCE	VFB=0V Iout=0.5A			0.87		In	
Maximum duty cycle	D _{MAX}	VFB=0V			90		%	



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Typical system application (recommended output current safe operating range)

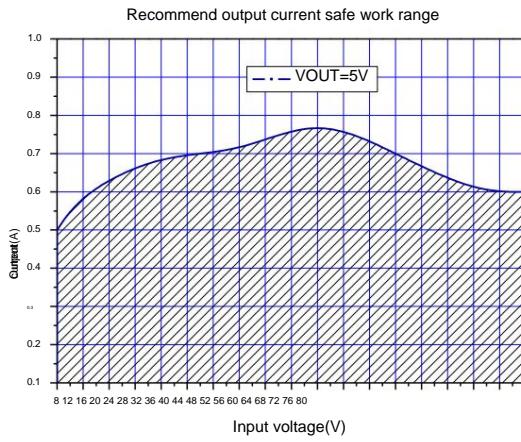


Figure 5. Maximum output current (VOUT=5V)

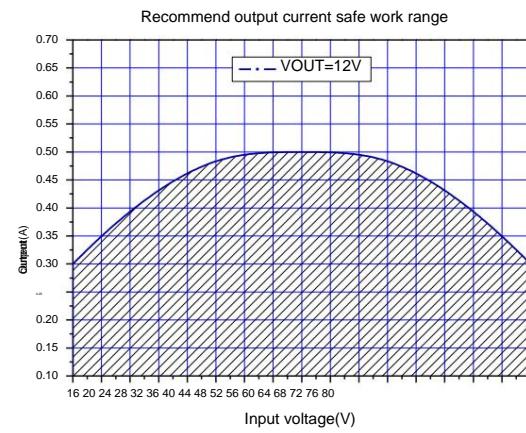


Figure 6. Maximum output current (VOUT=12V)

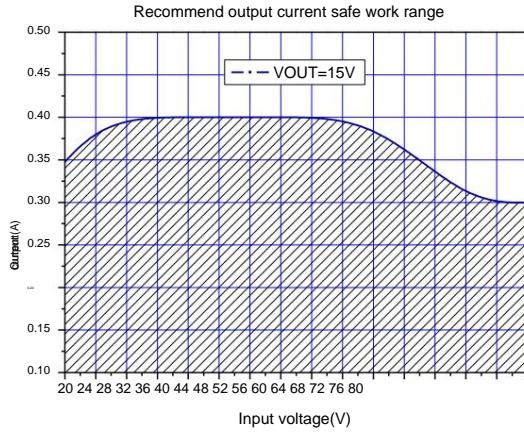


Figure 7. Maximum output current (VOUT=15V)



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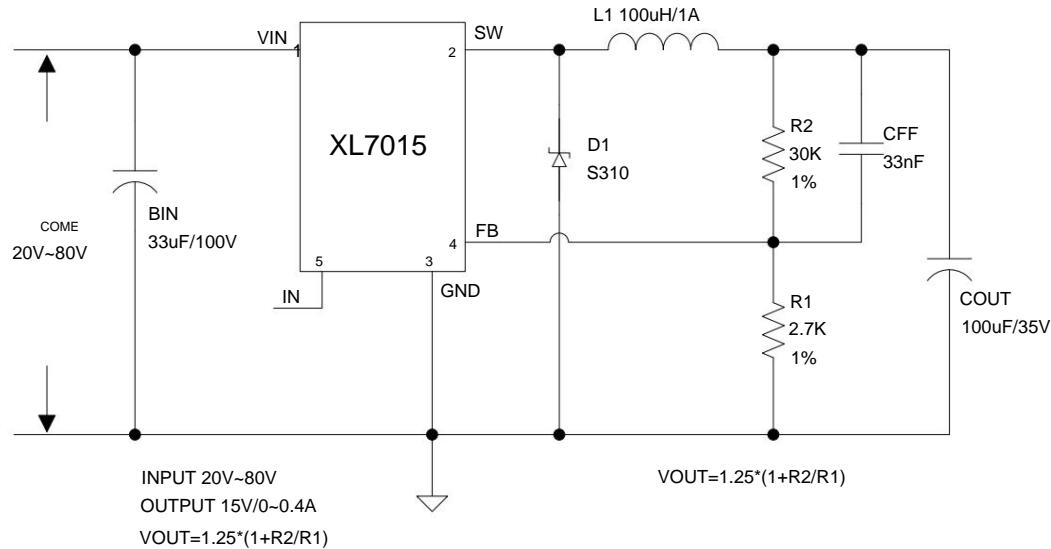
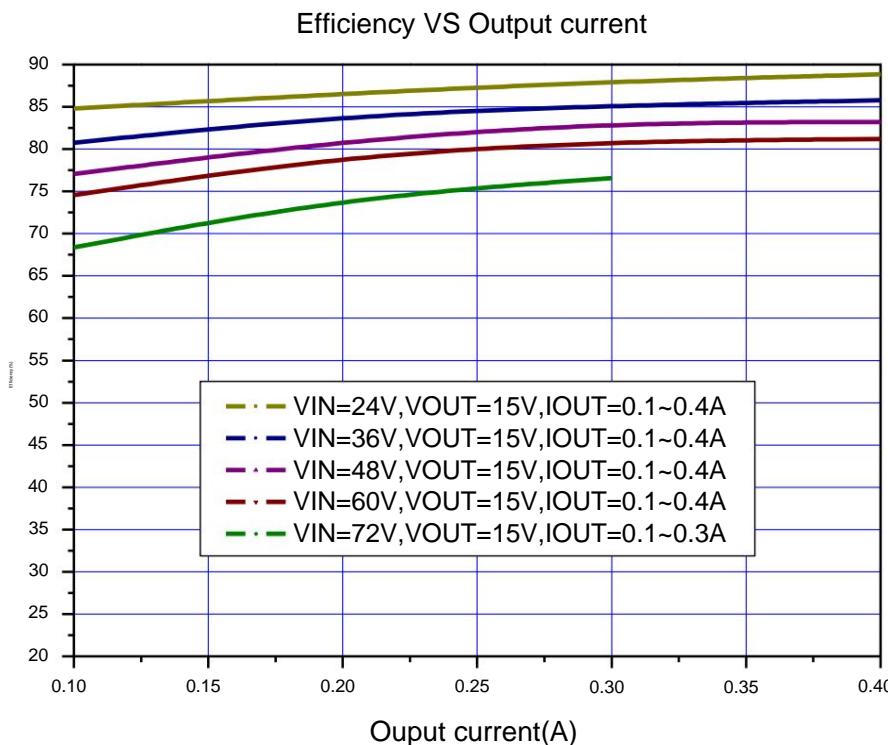
Typical system application ($V_{OUT}=15V/0.4A$)Figure 8. XL7015 system parameter measurement circuit ($V_{IN}=20V\sim 80V$, $V_{OUT}=15V/0.4A$)

Figure 9. XL7015 system efficiency curve



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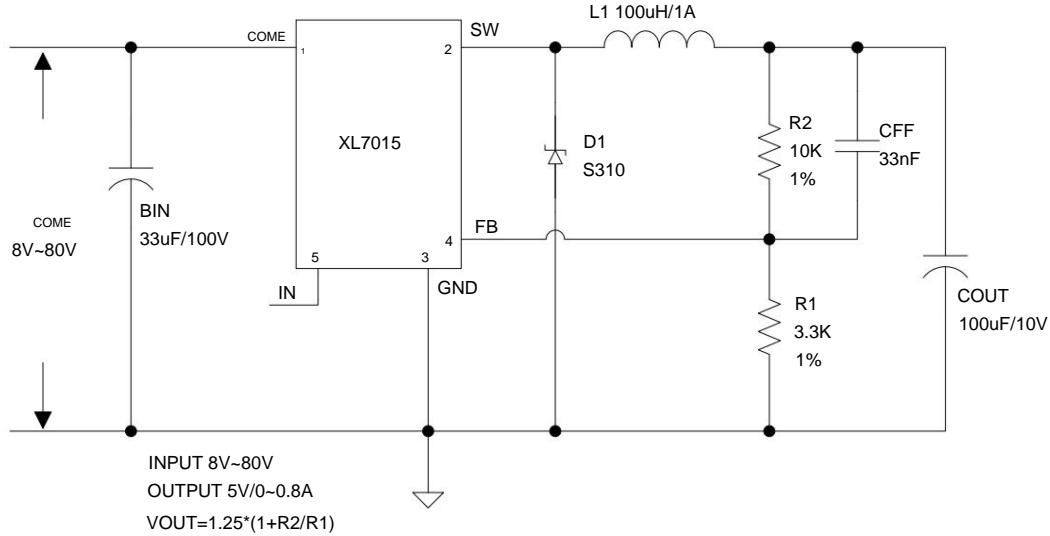
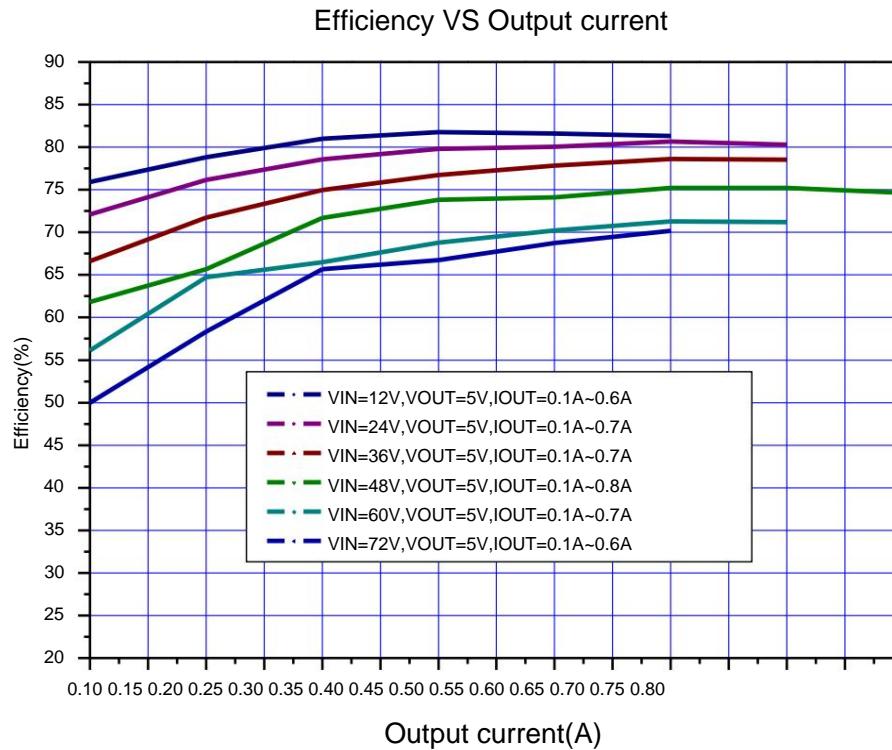
Typical system application ($V_{OUT}=5V/0.8A$)Figure 10. XL7015 system parameter measurement circuit ($V_{IN}=8V\sim80V$, $V_{OUT}=5V/0.8A$)

Figure 11. XL7015 system efficiency curve



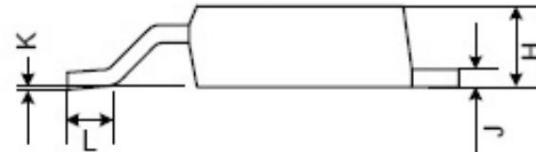
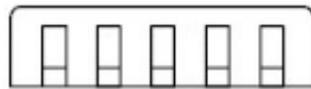
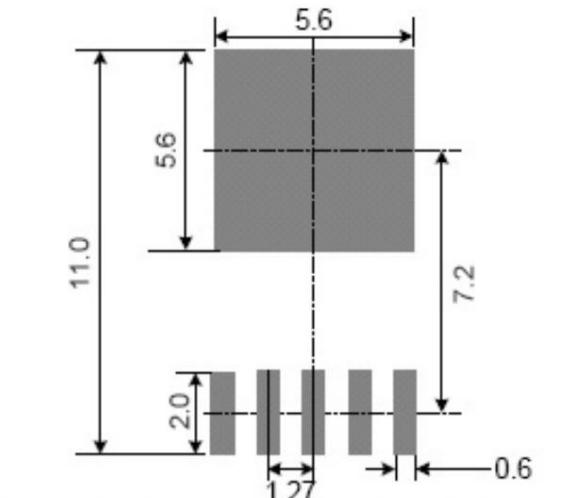
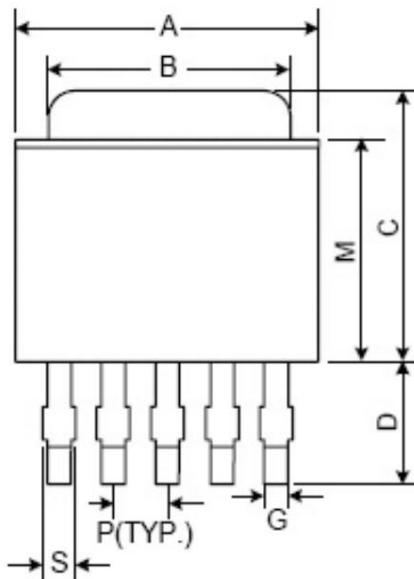
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Physical Dimensions

TO252-5L



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Name.	Max.	Min.	Nom.	Max.
A	6.35	6.60	6.85	0.250	0.260	0.270
B	5.20	5.35	5.50	0.205	0.211	0.217
C	6.80	7.00	7.30	0.268	0.276	0.287
D	2.40	2.80	3.20	0.094	0.110	0.126
P	1.27 REF.			0.05 REF.		
S	0.50	0.65	0.80	0.020	0.026	0.031
G	0.40	0.50	0.63	0.016	0.020	0.025
H	2.20	2.30	2.40	0.087	0.091	0.094
J	0.45	0.52	0.58	0.018	0.020	0.023
K	0.00	0.08	0.15	0.000	0.003	0.006
L	0.90	1.20	1.77	0.035	0.047	0.064
M	5.40	5.80	6.20	0.213	0.228	0.244



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