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Renesas Electronics website: <http://www.renesas.com>

April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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P-CHANNEL MOS FIELD EFFECT TRANSISTOR
FOR SWITCHING

DESCRIPTION

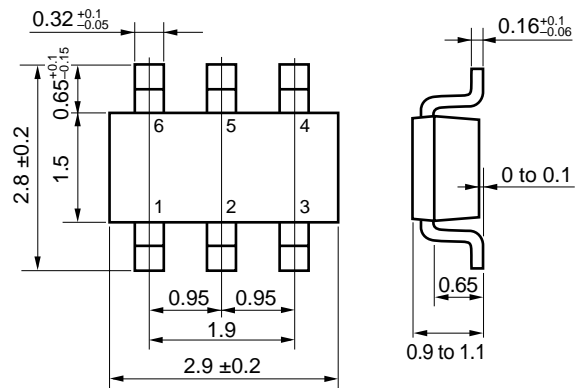
The μ PA1950 is a switching device which can be driven directly by a 1.8 V power source.

This device features a low on-state resistance and excellent switching characteristics, and is suitable for applications such as power switch of portable machine and so on.

FEATURES

- 1.8 V drive available
- Low on-state resistance
 $R_{DS(on)1} = 130 \text{ m}\Omega \text{ MAX. (} V_{GS} = -4.5 \text{ V, } I_D = -1.5 \text{ A)}$
 $R_{DS(on)2} = 176 \text{ m}\Omega \text{ MAX. (} V_{GS} = -3.0 \text{ V, } I_D = -1.5 \text{ A)}$
 $R_{DS(on)3} = 205 \text{ m}\Omega \text{ MAX. (} V_{GS} = -2.5 \text{ V, } I_D = -1.5 \text{ A)}$
 $R_{DS(on)4} = 375 \text{ m}\Omega \text{ MAX. (} V_{GS} = -1.8 \text{ V, } I_D = -1.0 \text{ A)}$

PACKAGE DRAWING (Unit : mm)



6: Drain1 4: Drain2
1: Gate1 3: Gate2
5: Source1 2: Source2

ORDERING INFORMATION

PART NUMBER	PACKAGE
μ PA1950TE ^{Note}	SC-95 (Mini Mold Thin Type)

Note Marking: TM

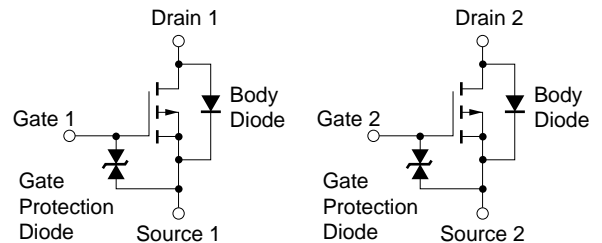
ABSOLUTE MAXIMUM RATINGS (T_A = 25°C)

Drain to Source Voltage (V _{GS} = 0 V)	V _{DSS}	-12	V
Gate to Source Voltage (V _{DS} = 0 V)	V _{GSS}	±8.0	V
Drain Current (DC) (T _A = 25°C)	I _{D(DC)}	±2.5	A
Drain Current (pulse) ^{Note1}	I _{D(pulse)}	±7.0	A
Total Power Dissipation (2unit) ^{Note2}	P _{T1}	1.15	W
Total Power Dissipation (1unit) ^{Note2}	P _{T2}	0.57	W
Channel Temperature	T _{ch}	150	°C
Storage Temperature	T _{stg}	-55 to +150	°C

- Notes** 1. PW ≤ 10 μs, Duty Cycle ≤ 1%
2. Mounted on FR-4 board, t ≤ 5 sec.

Remark The diode connected between the gate and source of the transistor serves as a protector against ESD. When this device actually used, an additional protection circuit is externally required if a voltage exceeding the rated voltage may be applied to this device.

EQUIVALENT CIRCUIT

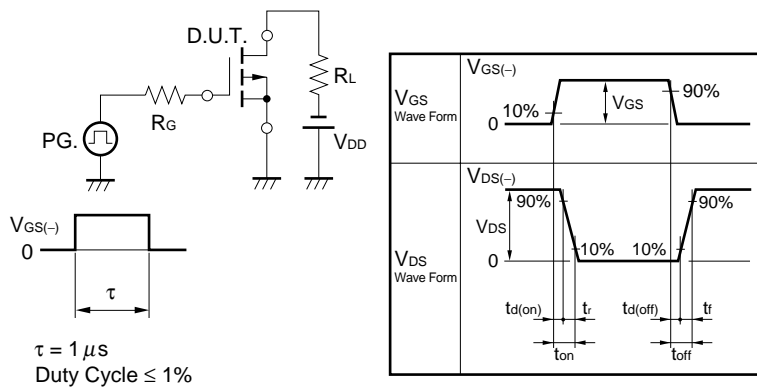


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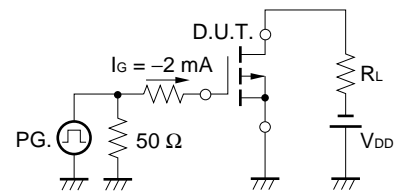
ELECTRICAL CHARACTERISTICS (T_A = 25°C)

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -12 V, V _{GS} = 0 V			-10	μA
Gate Leakage Current	I _{GSS}	V _{GS} = ±8.0 V, V _{DS} = 0 V			±10	μA
Gate Cut-off Voltage	V _{GS(off)}	V _{DS} = -10 V, I _D = -1.0 mA	-0.45		-1.5	V
Forward Transfer Admittance	y _{fs}	V _{DS} = -10 V, I _D = -1.5 A	1.0			S
Drain to Source On-state Resistance	R _{DS(on)1}	V _{GS} = -4.5 V, I _D = -1.5 A		105	130	mΩ
	R _{DS(on)2}	V _{GS} = -3.0 V, I _D = -1.5 A		135	176	mΩ
	R _{DS(on)3}	V _{GS} = -2.5 V, I _D = -1.5 A		160	205	mΩ
	R _{DS(on)4}	V _{GS} = -1.8 V, I _D = -1.0 A		225	375	mΩ
Input Capacitance	C _{iss}	V _{DS} = -10 V		220		pF
Output Capacitance	C _{oss}	V _{GS} = 0 V		90		pF
Reverse Transfer Capacitance	C _{rss}	f = 1.0 MHz		40		pF
Turn-on Delay Time	t _{d(on)}	V _{DD} = -6.0 V, I _D = -1.5 A		15		ns
Rise Time	t _r	V _{GS} = -4.0 V		80		ns
Turn-off Delay Time	t _{d(off)}	R _G = 10 Ω		150		ns
Fall Time	t _f			120		ns
Total Gate Charge	Q _G	V _{DD} = -10 V		1.9		nC
Gate to Source Charge	Q _{GS}	V _{GS} = -4.0 V		0.5		nC
Gate to Drain Charge	Q _{GD}	I _D = -2.5 A		0.7		nC
Body Diode Forward Voltage	V _{F(S-D)}	I _F = 2.5 A, V _{GS} = 0 V		0.86		V

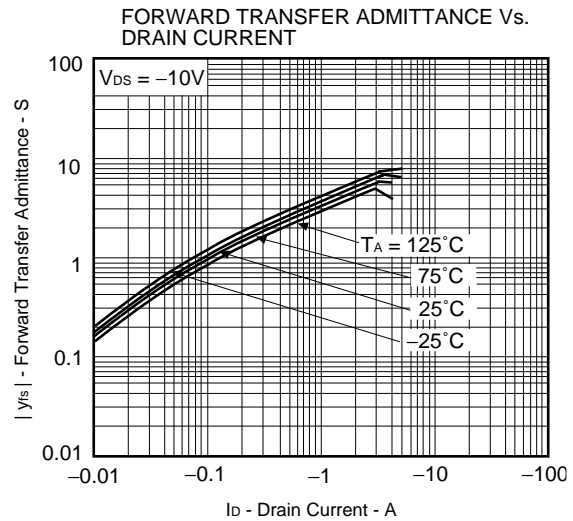
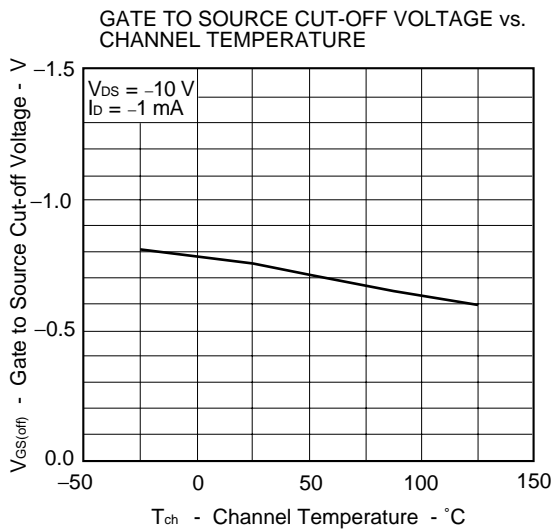
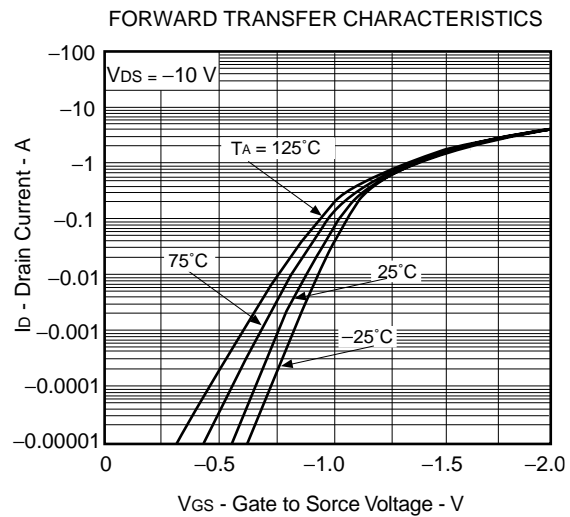
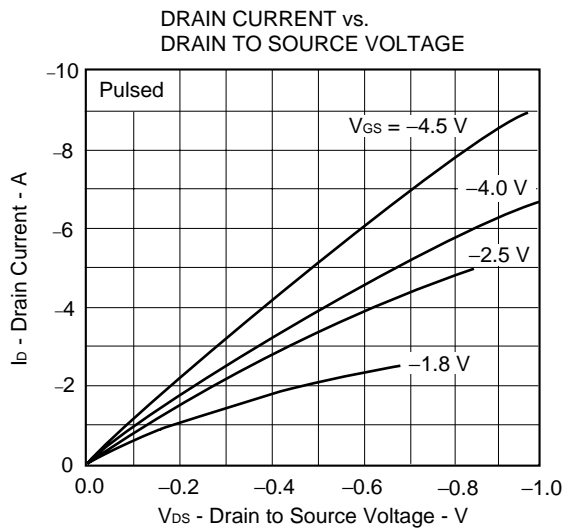
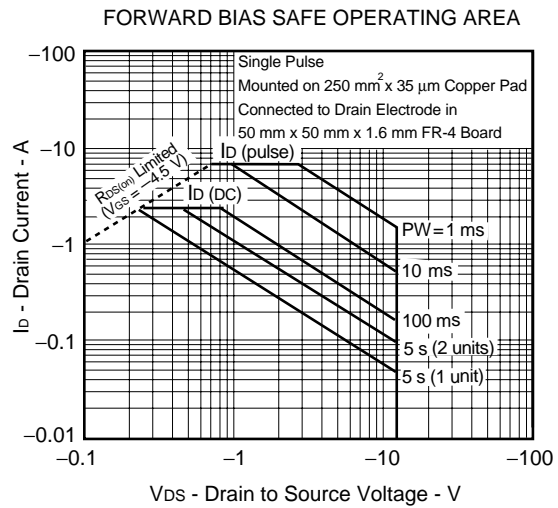
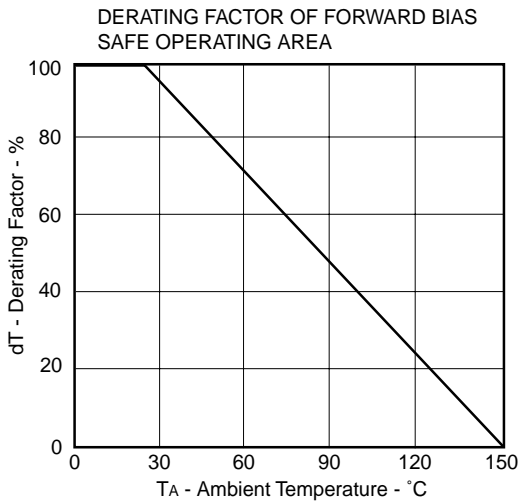
TEST CIRCUIT 1 SWITCHING TIME

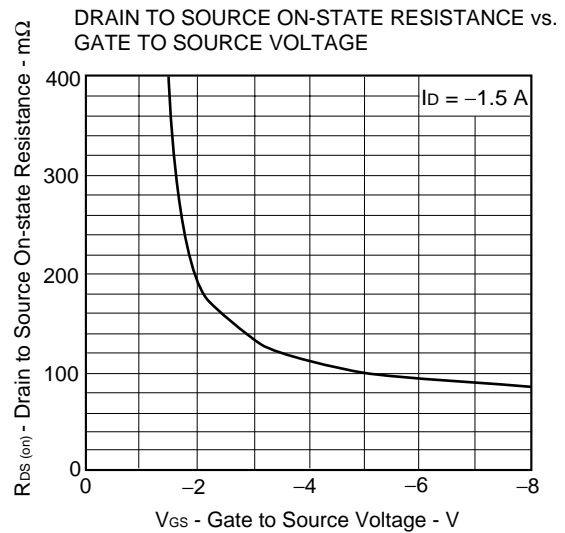
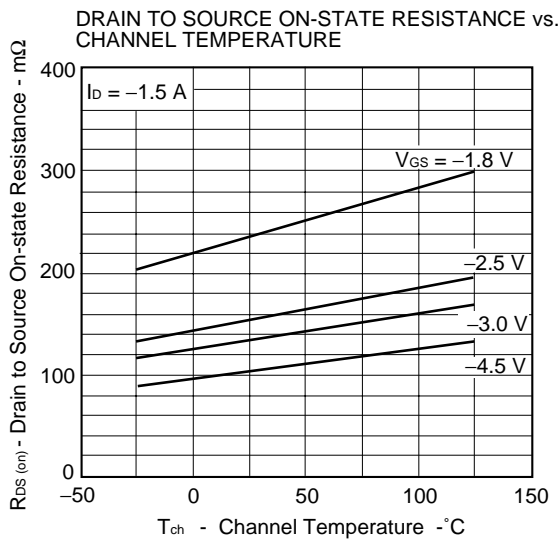
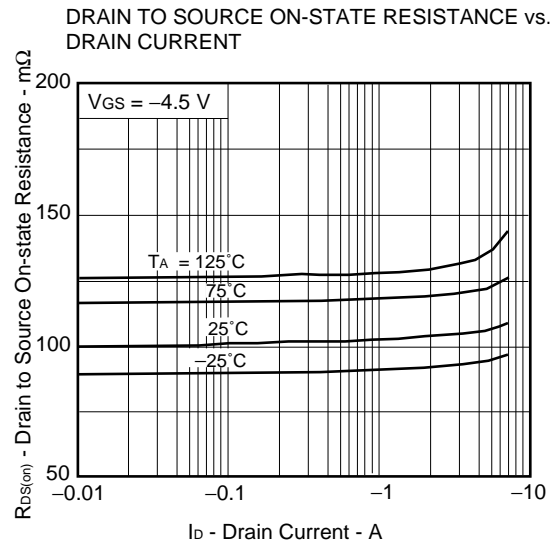
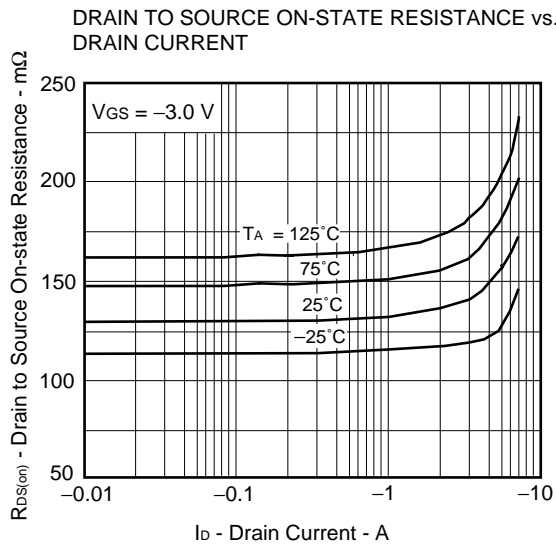
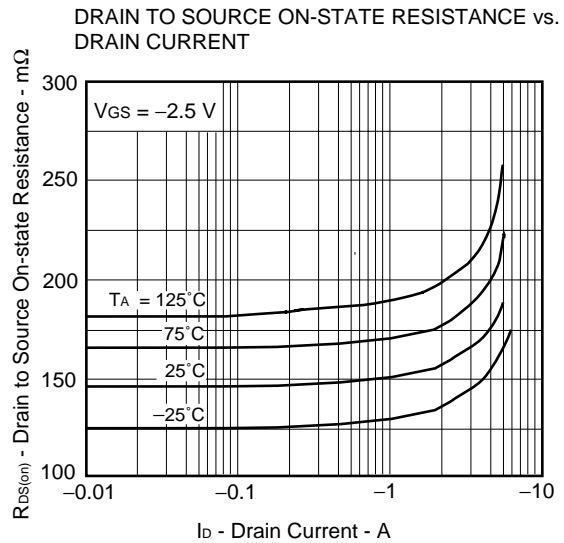
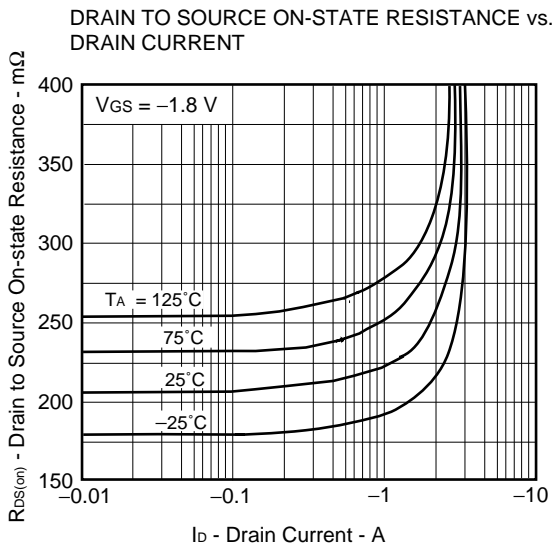


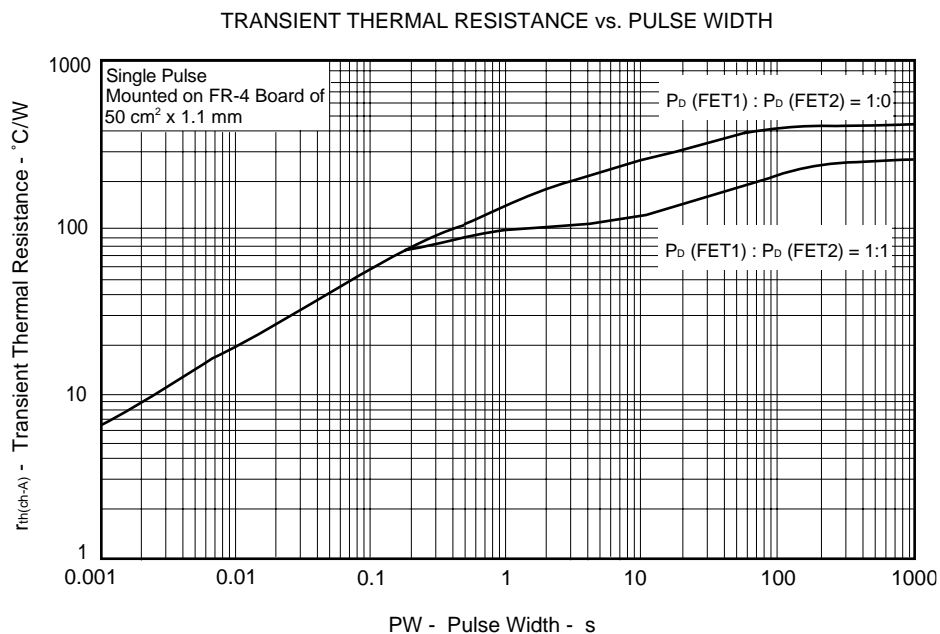
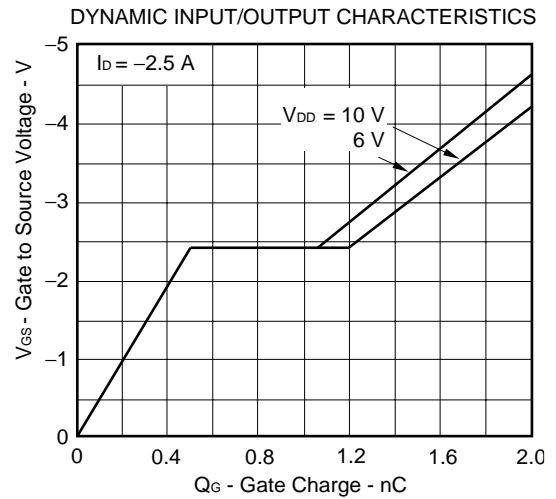
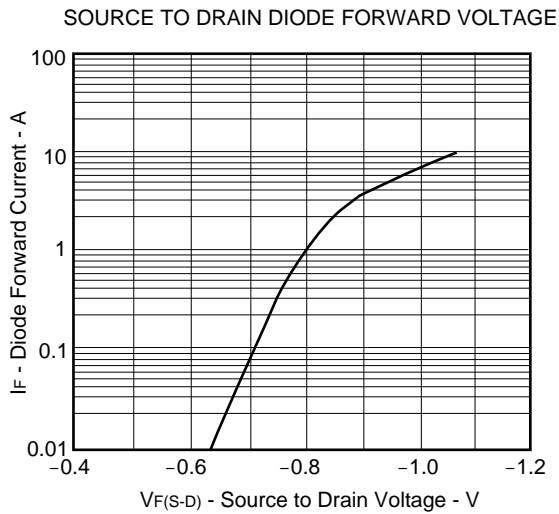
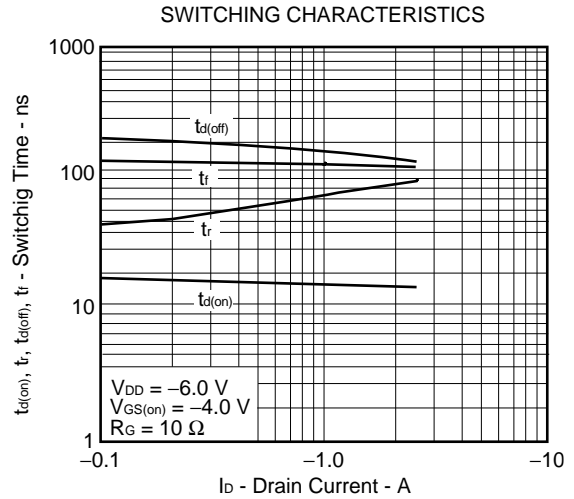
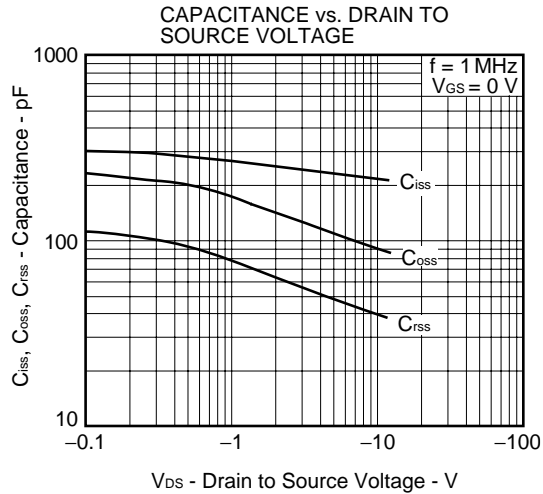
TEST CIRCUIT 2 GATE CHARGE



TYPICAL CHARACTERISTICS (T_A = 25°C)







[MEMO]

[MEMO]

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