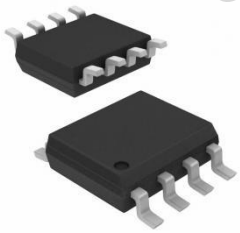
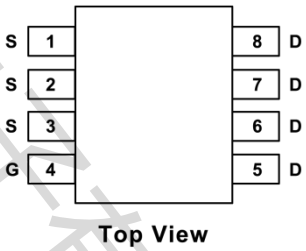
AO4800-HX

Dual N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	Qg (Typ.)	I_D (A)
30	0.022 at V_{GS} = 10 V	15nC	6.8
	0.026 at V_{GS} = 4.5 V		6.0



SOP-8



Top View

FEATURES

- TrenchFET® Power MOSFET
- 100 % R_g Tested
- 100 % UIS Tested

APPLICATIONS

- Set Top Box
- Low Current DC/DC

MAXIMUM RATINGS (TJ = 25° C unless otherwise stated)					
Rating			**Symbol**	**Value**	**Unit**
Drain−to−Source Voltage			V_{DSS}	30	V
Gate−to−Source Voltage			V_{GS}	±20	V
Continuous Drain Current R_{0JA} (Note 1)	Steady State	T_A = 25°C	I_D	5.5	A
		T_A = 70°C		4.4	
Power Dissipation R_{0JA} (Note 1)		T_A = 25°C	P_D	1.14	W
Continuous Drain Current R_{0JA} (Note 2)		T_A = 25°C	I_D	4.5	A
		T_A = 70°C		3.5	
Power Dissipation R_{0JA} (Note 2)		T_A = 25°C	P_D	0.68	W
Continuous Drain Current R_{0JA} t < 10 s (Note 1)		T_A = 25°C	I_D	7.5	A
		T_A = 70°C		6.0	
Power Dissipation R_{0JA} t < 10 s (Note 1)		T_A = 25°C	P_D	1.95	W
Pulsed Drain Current		T_A = 25°C,t_p = 10 μs	I_{DM}	30	A
Operating Junction and Storage Temperature			T_J, T_{STG}	−55 to,+150	°C
Source Current (Body Diode)			I_S	2.0	A
Single Pulse Drain−to−Source Avalanche Energy T_J = 25°C, V_{DD} = 30 V, V_{GS} = 10 V, I_L = 7.5 A_{pk}, L = 1.0 mH, R_G = 25 fi			EAS	28	mJ
Lead Temperature for Soldering Purposes (1/8″ from case for 10 s)			T_L	260	°C

THERMAL RESISTANCE RATINGS			
Rating	**Symbol**	**Max**	**Unit**
Junction−to−Ambient – Steady State (Note 1)	R_{0JA}	110	°C/W
Junction−to−Ambient – t≤10 s (Note 1)	R_{0JA}	64	
Junction−to−FOOT (Drain)	R_{0JF}	40	
Junction−to−Ambient – Steady State (Note 2)	R_{0JA}	183.5	

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1.Surface−mounted on FR4 board using 1 inch sq pad size, 1 oz Cu.

2.Surface−mounted on FR4 board using the minimum recommended pad size.

ELECTRICAL CHARACTERISTICS (TJ = 25° C unless otherwise noted)							
Characteristic	**Symbol**	**Test Condition**		**Min**	**Typ**	**Max**	**Unit**
OFF CHARACTERISTICS							
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 μA		30			V
Drain−to−Source Breakdown Voltage Tem- perature Coefficient	$V_{(BR)DSS}/T_J$				18		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V, V_{DS} = 24 V	T_J = 25°C			1.0	μA
			T_J = 100°C			10	
Gate−to−Source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V				±100	nA
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250 μA		1.5		3.0	V
Negative Threshold Temperature	$V_{GS(TH)}/T_J$				6.0		mV/°C
Drain−to−Source On Resistance	$R_{DS(on)}$	V_{GS}=10 V	I_D = 6.9 A		16	24	mfi
		V_{GS}=4.5V	I_D = 5.0 A		26	36	
Forward Transconductance	g_{FS}	V_{DS} = 1.5 V, I_D = 6.9 A			15		S
CHARGES, CAPACITANCES AND GATE RESISTANCE							
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1.0 MHz, V_{DS} = 15 V			520		pF
Output Capacitance	C_{OSS}				140		
Reverse Transfer Capacitance	C_{RSS}				70		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 4.5 V,V_{DS} = 15 V,I_D = 6.9 A			4.8		nC
Threshold Gate Charge	$Q_{G(TH)}$				1.1		
Gate−to−Source Charge	Q_{GS}				2.1		
Gate−to−Drain Charge	Q_{GD}				1.9		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 10 V, V_{DS} = 15 V, I_D =6.9A			9.5		nC
SWITCHING CHARACTERISTICS (Note 4)							
Turn−On Delay Time	$t_{d(ON)}$	V_{GS} = 10 V, V_{DD} = 15 V, I_D = 1.0 A, R_G = 3.0 fi			7.6		ns
Rise Time	t_r				5.0		
Turn−Off Delay Time	$t_{d(OFF)}$				17		
Fall Time	t_f				3.0		
DRAIN−TO−SOURCE CHARACTERISTICS							
Forward Diode Voltage	V_{SD}	V_{GS}=0V I_D=2.0A	T_J = 25°C		0.76	1.0	V
			T_J = 125°C		0.58		ns
Reverse Recovery Time	t_{RR}	V_{GS} = 0 V, d_{IS}/d_t = 100 A/μs,			12.5		
Charge Time	T_a				7.3		
Discharge Time	T_b				5.2		

Reverse Recovery Time	Q_{RR}	I_S = 2.0 A		6.0		nC
PACKAGE PARASITIC VALUES						
Source Inductance	L_S	T_A = 25°C		0.66		nH
Drain Inductance	L_D			0.20		nH
Gate Inductance	L_G	T_A = 25°C		1.50		nH
Gate Resistance	R_G			2.0	3.0	fi

3.Pulse Test: pulse width ≤ 300 μs, duty cycle ≤ 2%.

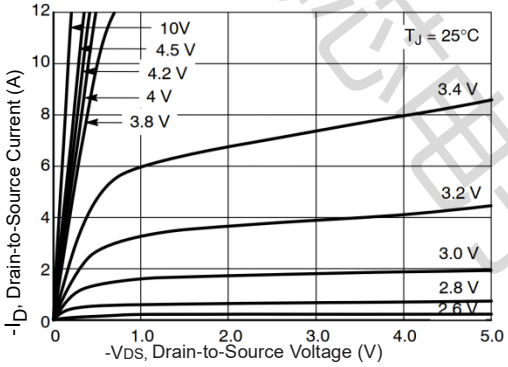


Fig 1. Typical Output Characteristics

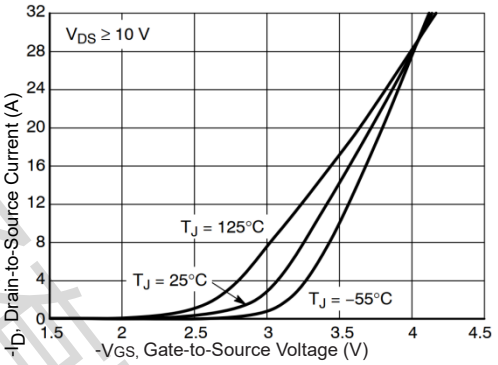


Fig 2. Typical Transfer Characteristics

4.Switching characteristics are independent of operating junction te

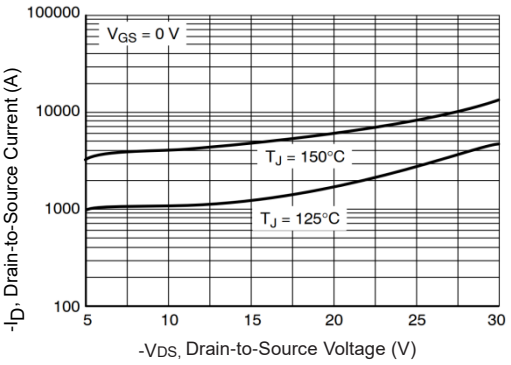


Fig 3. Typical Output Characteristics

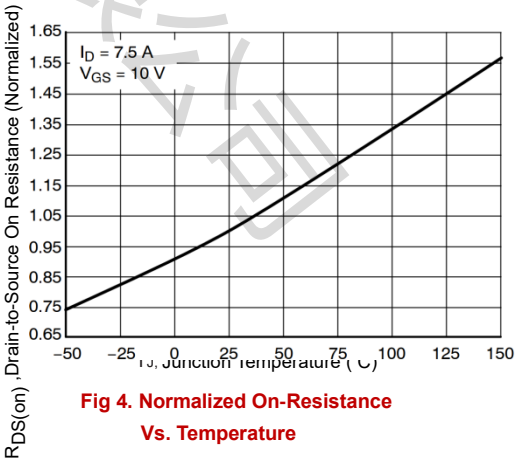


Fig 4. Normalized On-Resistance Vs. Temperature

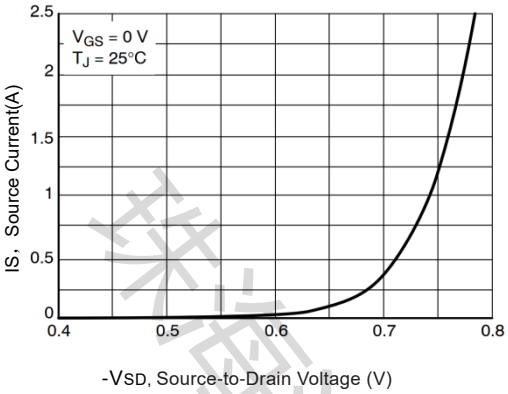


Fig 5. Typical Source-Drain Diode Forward Voltage

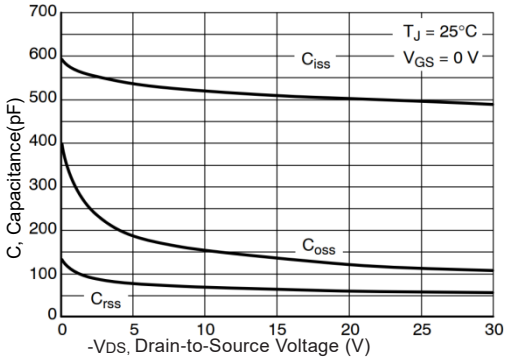


Fig 6. Typical Capacitance Vs. Drain-to-Source Voltage

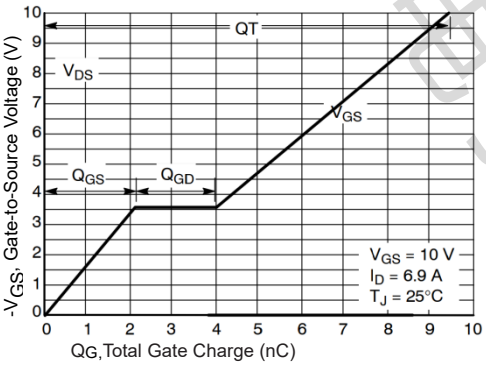


Fig 7. Gate–To–Source and Drain–To–Source Voltage vs. Total Charge

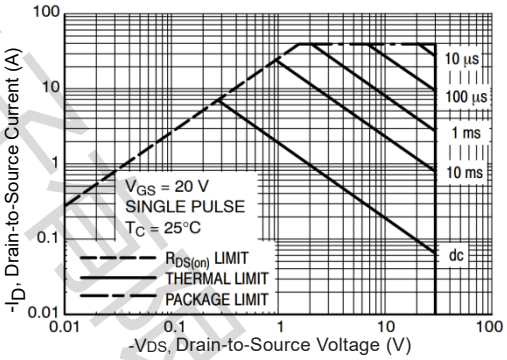


Fig 8.Maximum Safe Operating Area

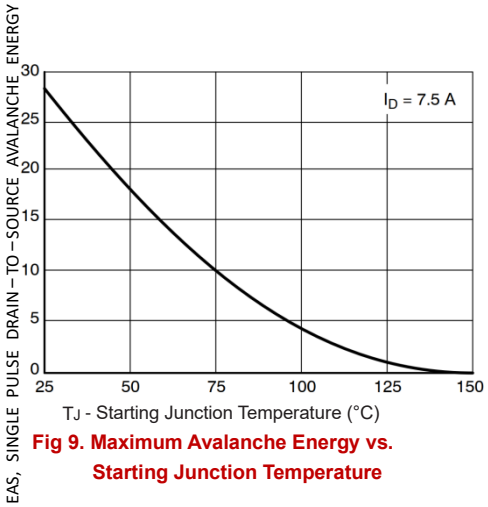


Fig 9. Maximum Avalanche Energy vs. Starting Junction Temperature

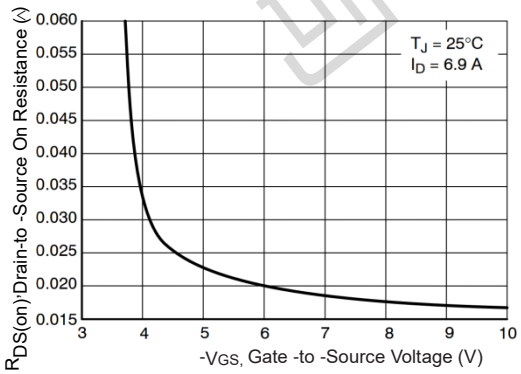


Fig 10. Typical On-Resistance Vs. Gate Voltage

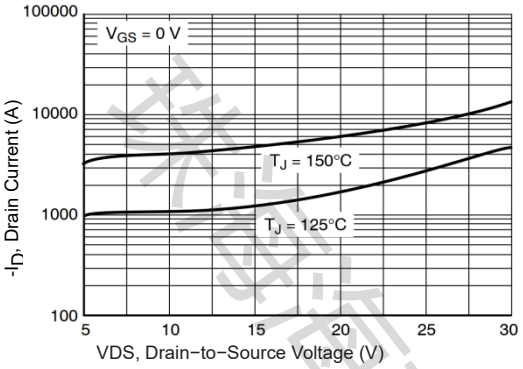


Fig 11. Drain−to−Source Leakage Current vs. Voltage

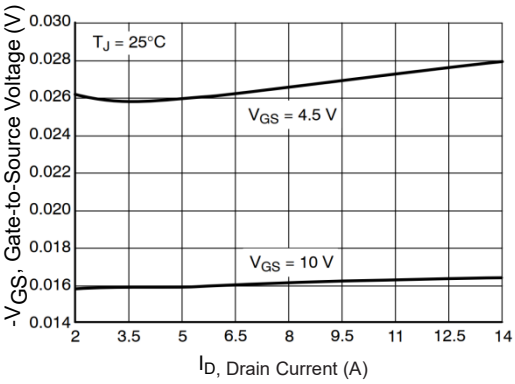


Fig 12. Typical On-Resistance Vs. Drain Current

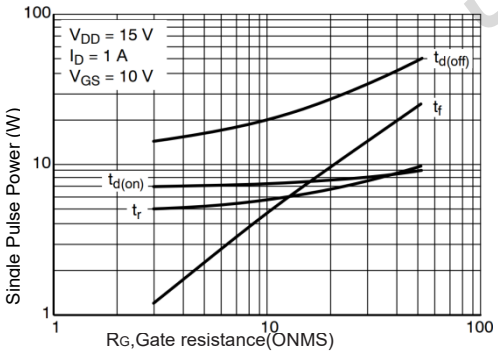
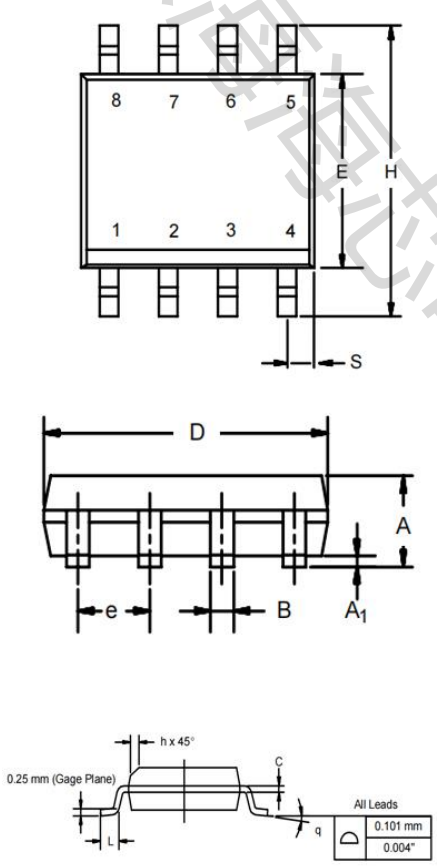


Fig 13. Resistive Switching Time Variation vs. Gate Resistance

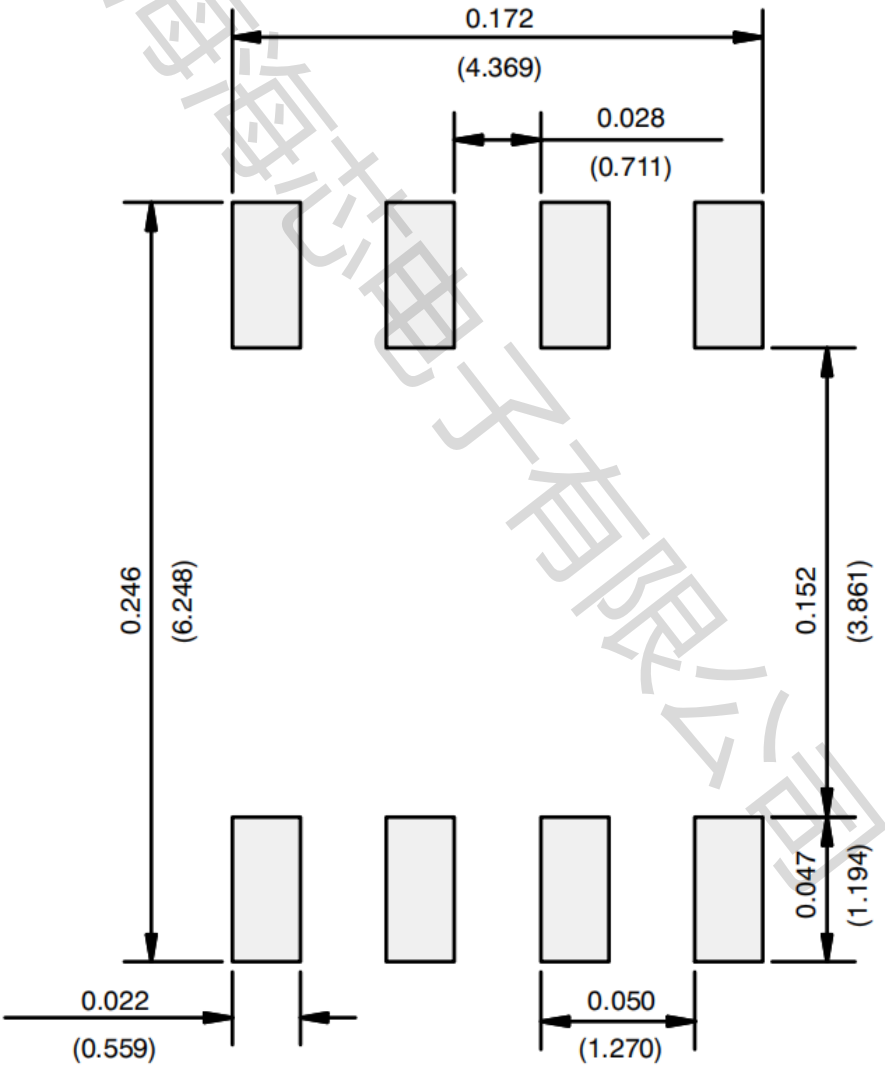
SOP-8 Package Outline

Dimensions are shown in millimeters (inches)



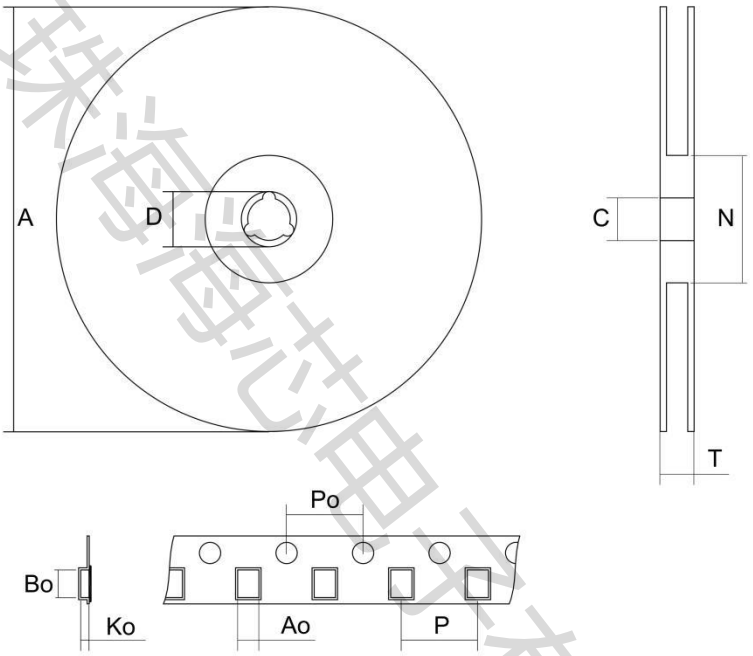
DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A_1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.007 5	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026

RECOMMENDED MINIMUM PADS FOR SOP-8

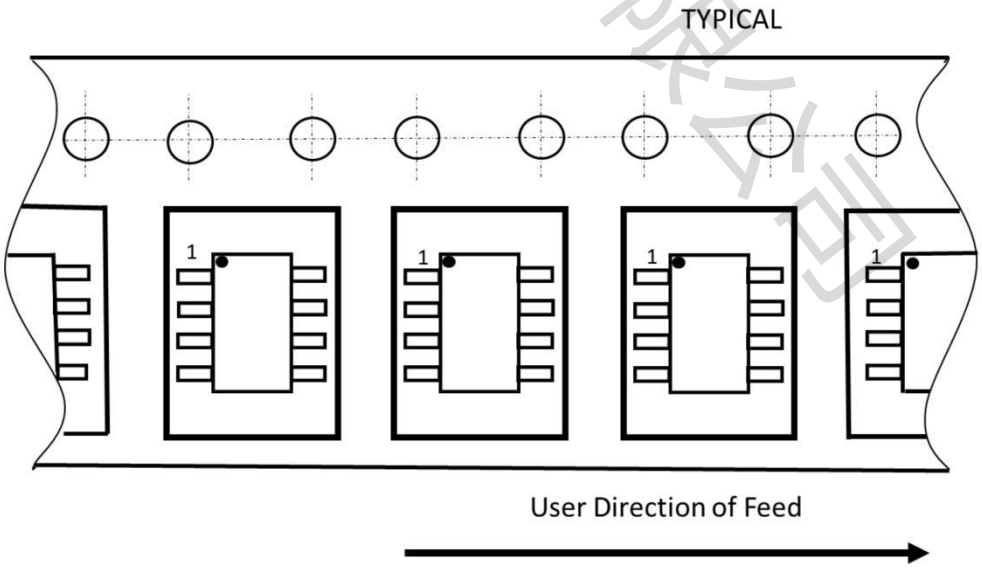


SOP-8 packing information

SOP-8 tape and reel



Tape orientation



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