

Polar™ HiperFET™ Power MOSFET

IXFK170N20P
IXFX170N20P

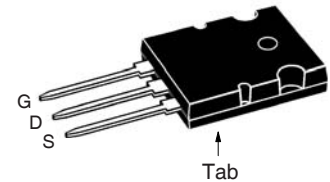
V_{DSS} = 200V
I_{D25} = 170A
R_{DS(on)} ≤ 14mΩ

N-Channel Enhancement Mode
Avalanche Rated
Fast Intrinsic Diode

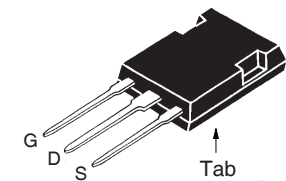


Symbol	Test Conditions	Maximum Ratings	
V _{DSS}	T _J = 25°C to 175°C	200	V
V _{DGR}	T _J = 25°C to 175°C, R _{GS} = 1MΩ	200	V
V _{GSS}	Continuous	±20	V
V _{GSM}	Transient	±30	V
I _{D25}	T _C = 25°C	170	A
I _{LRMS}	Lead Current Limit	160	A
I _{DM}	T _C = 25°C, Pulse Width Limited by T _{JM}	400	A
I _A	T _C = 25°C	85	A
E _{AS}	T _C = 25°C	4	J
dv/dt	I _S ≤ I _{DM} , V _{DD} ≤ V _{DSS} , T _J ≤ 175°C	20	V/ns
P _D	T _C = 25°C	1250	W
T _J		-55 ... +175	°C
T _{JM}		175	°C
T _{stg}		-55 ... +175	°C
L	Maximum Lead Temperature for Soldering	300	°C
T _{SOLD}	1.6 mm (0.062in.) from Case for 10s	260	°C
M _d	Mounting Force (PLUS247) Mounting Torque (TO-264)	20..120/4.5..27 1.13/10	N/lb Nm/lb.in
Weight	PLUS247 TO-264	6 10	g g

TO-264 (IXFK)



PLUS247 (IXFX)



G = Gate D = Drain
S = Source Tab = Drain

Features

- Dynamic dv/dt Rating
- Avalanche Rated
- Fast Intrinsic Diode
- Low Q_G
- Low R_{DS(on)}
- Low Drain-to-Tab Capacitance
- Low Package Inductance

Advantages

- Easy to Mount
- Space Savings

Applications

- DC-DC Converters
- Battery Chargers
- Switch-Mode and Resonant-Mode Power Supplies
- Uninterrupted Power Supplies
- AC Motor Drives
- DC Choppers
- High Speed Power Switching Applications

Symbol	Test Conditions (T _J = 25°C, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
BV _{DSS}	V _{GS} = 0V, I _D = 3mA	200		V
V _{GS(th)}	V _{DS} = V _{GS} , I _D = 1mA	2.5		4.5 V
I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±200 nA
I _{DSS}	V _{DS} = V _{DSS} , V _{GS} = 0V T _J = 150°C			50 μA 1 mA
R _{DS(on)}	V _{GS} = 10V, I _D = 0.5 • I _{D25} , Note 1			14 mΩ

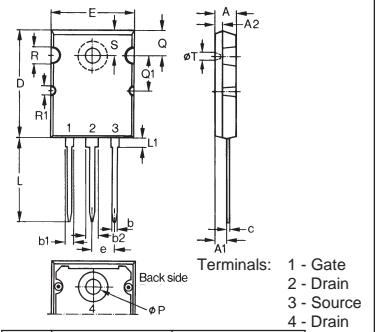
Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
g_{fs}	$V_{DS} = 10\text{V}, I_D = 60\text{A}$, Note 1	45	75	S
C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 25\text{V}, f = 1\text{MHz}$		11.4	nF
C_{oss}			2440	pF
C_{rss}			70	pF
$t_{d(on)}$	Resistive Switching Times $V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$ $R_G = 1\Omega$ (External)		40	ns
t_r			25	ns
$t_{d(off)}$			50	ns
t_f			14	ns
$Q_{g(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 0.5 \cdot V_{DSS}, I_D = 0.5 \cdot I_{D25}$		185	nC
Q_{gs}			80	nC
Q_{gd}			60	nC
R_{thJC}			0.12	$^\circ\text{C/W}$
R_{thCS}		0.15		$^\circ\text{C/W}$

Source-Drain Diode

Symbol	Test Conditions ($T_J = 25^\circ\text{C}$, Unless Otherwise Specified)	Characteristic Values		
		Min.	Typ.	Max.
I_S	$V_{GS} = 0\text{V}$			170 A
I_{SM}	Repetitive, Pulse Width Limited by T_{JM}			510 A
V_{SD}	$I_F = 85\text{A}, V_{GS} = 0\text{V}$, Note 1			1.3 V
t_{rr}	$I_F = 85\text{A}, -di/dt = 150\text{A}/\mu\text{s}$ $V_R = 100\text{V}, V_{GS} = 0\text{V}$		1.6	200 ns
Q_{RM}			20	μC
I_{RM}				A

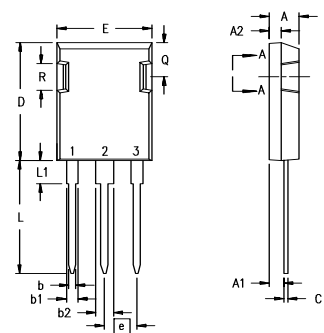
Note 1: Pulse test, $t \leq 300\mu\text{s}$, duty cycle, $d \leq 2\%$.

TO-264 AA Outline



Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.82	5.13	.190	.202
A1	2.54	2.89	.100	.114
A2	2.00	2.10	.079	.083
b	1.12	1.42	.044	.056
b1	2.39	2.69	.094	.106
b2	2.90	3.09	.114	.122
c	0.53	0.83	.021	.033
D	25.91	26.16	1.020	1.030
E	19.81	19.96	.780	.786
e	5.46 BSC		.215 BSC	
J	0.00	0.25	.000	.010
K	0.00	0.25	.000	.010
L	20.32	20.83	.800	.820
L1	2.29	2.59	.090	.102
P	3.17	3.66	.125	.144
Q	6.07	6.27	.239	.247
Q1	8.38	8.69	.330	.342
R	3.81	4.32	.150	.170
R1	1.78	2.29	.070	.090
S	6.04	6.30	.238	.248
T	1.57	1.83	.062	.072

PLUS247™ Outline



Terminals: 1 - Gate
2 - Drain
3 - Source

Dim.	Millimeter		Inches	
	Min.	Max.	Min.	Max.
A	4.83	5.21	.190	.205
A1	2.29	2.54	.090	.100
A2	1.91	2.16	.075	.085
b	1.14	1.40	.045	.055
b1	1.91	2.13	.075	.084
b2	2.92	3.12	.115	.123
C	0.61	0.80	.024	.031
D	20.80	21.34	.819	.840
E	15.75	16.13	.620	.635
e	5.45 BSC		.215 BSC	
L	19.81	20.32	.780	.800
L1	3.81	4.32	.150	.170
Q	5.59	6.20	.220	0.244
R	4.32	4.83	.170	.190

IXYS Reserves the Right to Change Limits, Test Conditions, and Dimensions.

IXYS MOSFETs and IGBTs are covered by one or more of the following U.S. patents:	4,835,592	4,931,844	5,049,961	5,237,481	6,162,665	6,404,065 B1	6,683,344	6,727,585	7,005,734 B2	7,157,338B2
	4,860,072	5,017,508	5,063,307	5,381,025	6,259,123 B1	6,534,343	6,710,405 B2	6,759,692	7,063,975 B2	
	4,881,106	5,034,796	5,187,117	5,486,715	6,306,728 B1	6,583,505	6,710,463	6,771,478 B2	7,071,537	

Fig. 1. Output Characteristics @ $T_J = 25^\circ\text{C}$

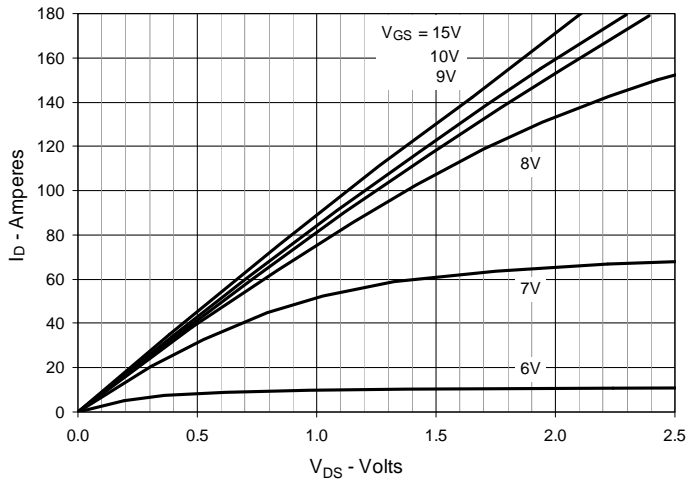


Fig. 2. Extended Output Characteristics @ $T_J = 25^\circ\text{C}$

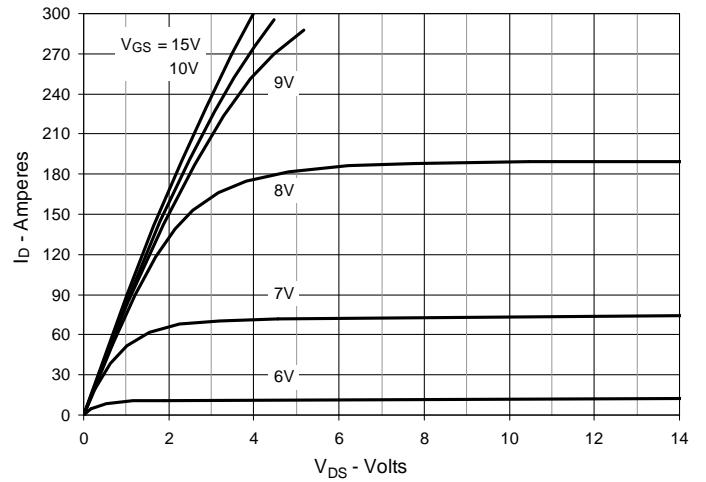


Fig. 3. Output Characteristics @ $T_J = 150^\circ\text{C}$

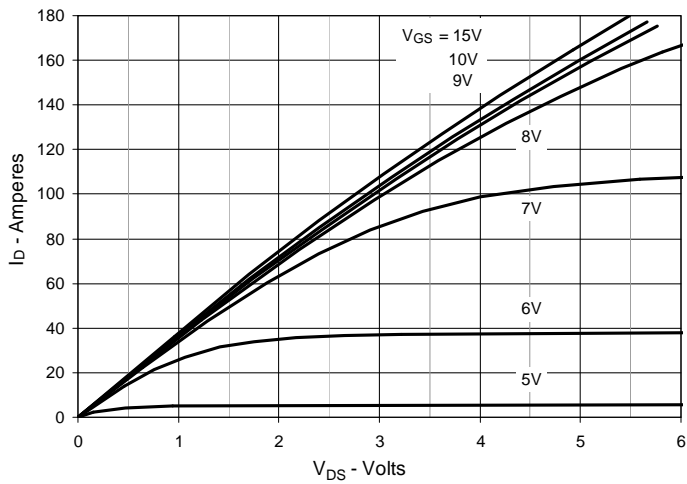


Fig. 4. $R_{DS(on)}$ Normalized to $I_D = 85\text{A}$ Value vs. Junction Temperature

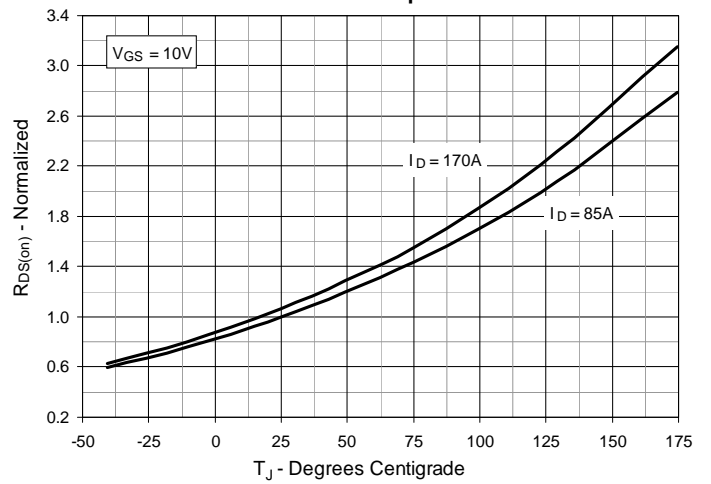


Fig. 5. $R_{DS(on)}$ Normalized to $I_D = 85\text{A}$ Value vs. Drain Current

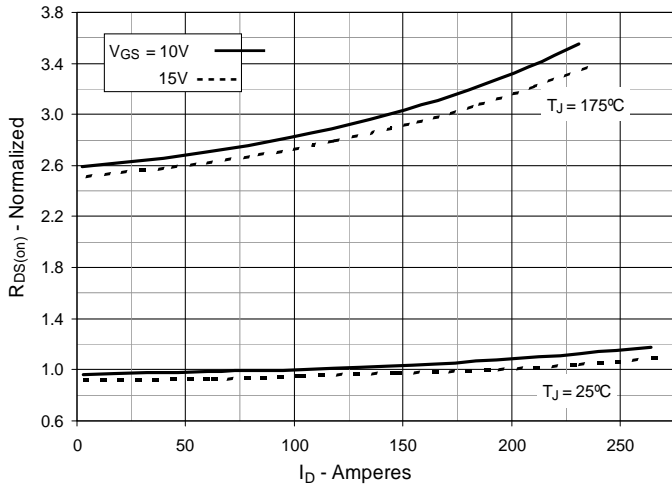


Fig. 6. Maximum Drain Current vs. Case Temperature

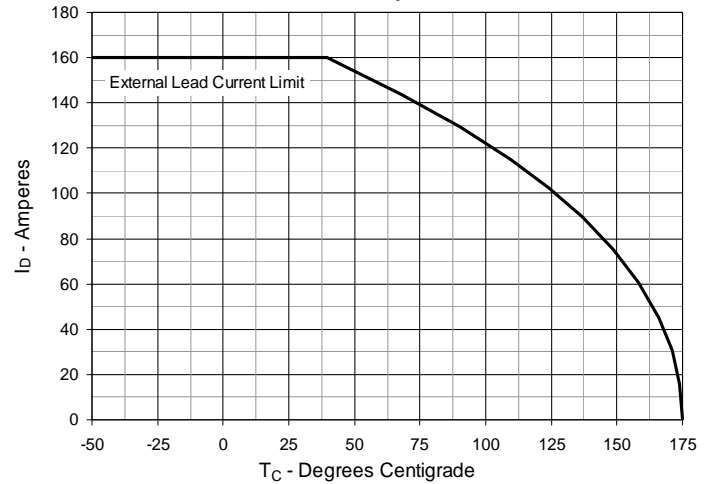


Fig. 7. Input Admittance

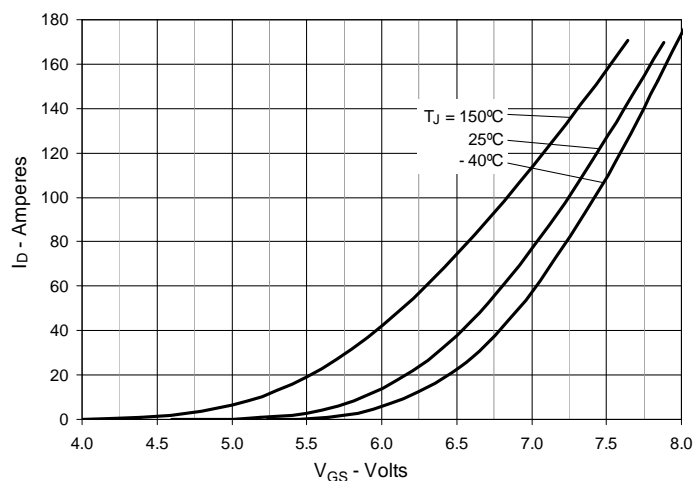


Fig. 8. Transconductance

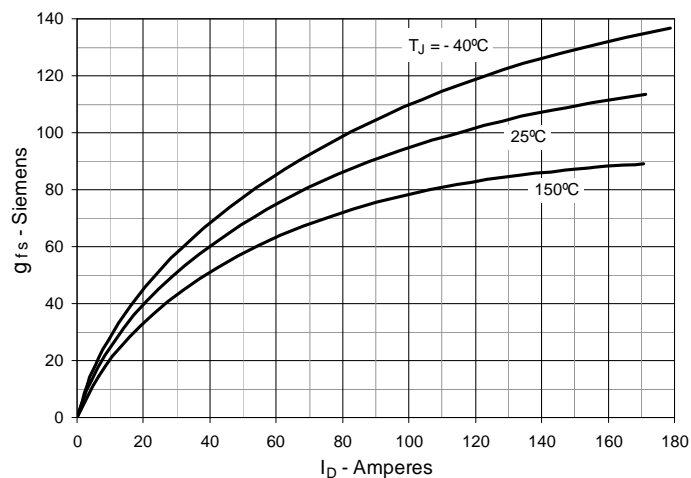


Fig. 9. Forward Voltage Drop of Intrinsic Diode

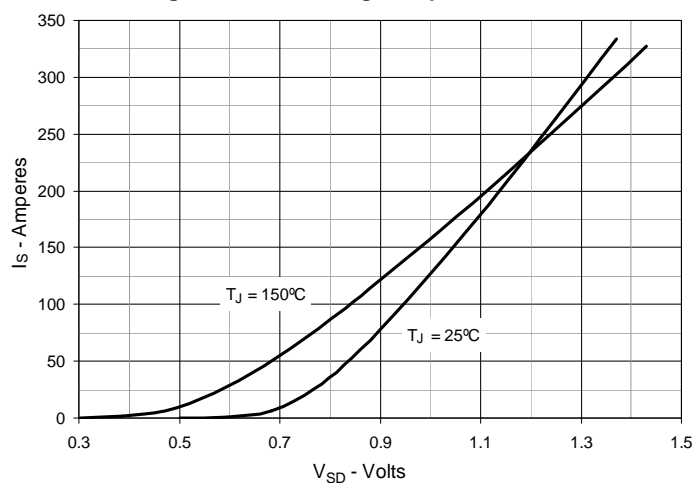


Fig. 10. Gate Charge

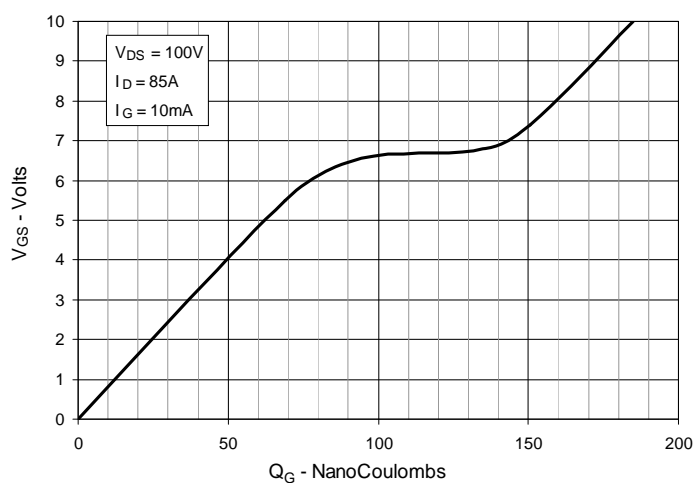


Fig. 11. Capacitance

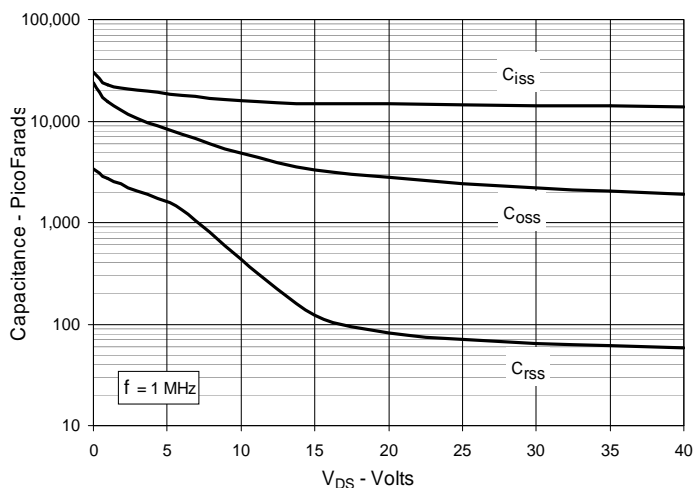


Fig. 12. Forward-Bias Safe Operating Area

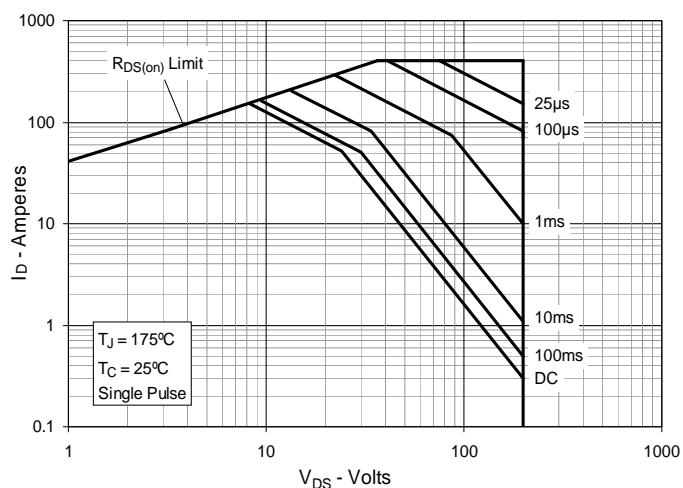
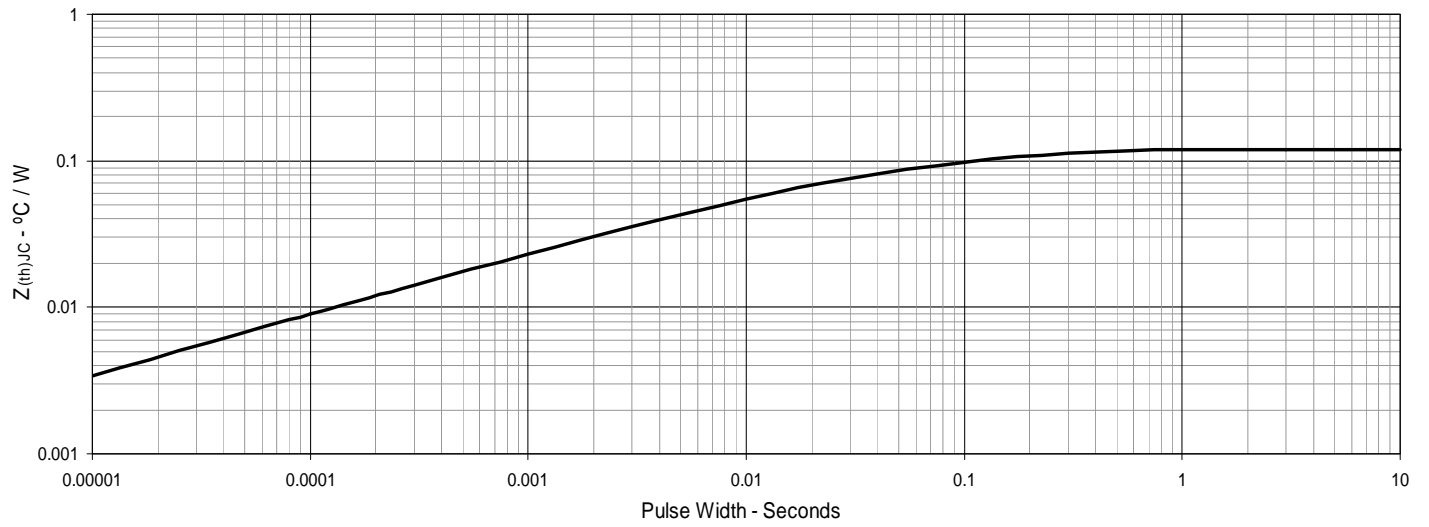


Fig. 13. Maximum Transient Thermal Impedance





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