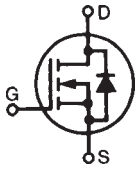
IXYS

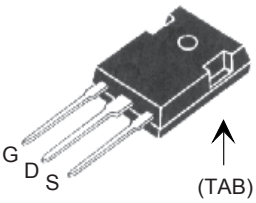
PolarHT™ Power MOSFET

IXTH 96N20P	V_{DSS}	=	200 V
IXTQ 96N20P	I_{D25}	=	96 A
IXTT 96N20P	$R_{DS(on)}$	≤	24 mΩ

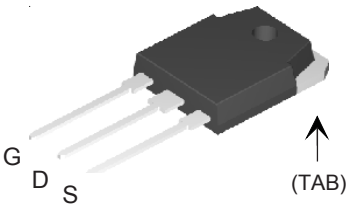
N-Channel Enhancement Mode
Avalanche Rated



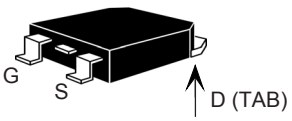
TO-247 (IXTH)



TO-3P (IXTQ)



TO-268 (IXTT)



G = Gate D = Drain
S = Source TAB = Drain

Symbol	Test Conditions	Maximum Ratings	
V_{DSS}	T_J = 25°C to 150°C	200	V
V_{DGR}	T_J = 25°C to 150°C; R_{GS} = 1 MΩ	200	V
V_{GSS}	Continous	±20	V
V_{GSM}	Transient	±30	V
I_{D25}	T_C = 25°C	96	A
$I_{D(RMS)}$	External lead current limit	75	A
I_{DM}	T_C = 25°C, pulse width limited by T_{JM}	225	A
I_{AR}	T_C = 25°C	60	A
E_{AR}	T_C = 25°C	50	mJ
E_{AS}	T_C = 25°C	1.5	J
dv/dt	$I_S \le I_{DM}$, di/dt ≤100 A/μs, $V_{DD} \le V_{DSS}$, T_J ≤150°C, R_G = 4 Ω	10	V/ns
P_D	T_C = 25°C	600	W
T_J		-55 ... +175	°C
T_{JM}		175	°C
T_{stg}		-55 ... +150	°C
T_L	1.6 mm (0.062 in.) from case for 10 s	300	°C
T_{SOLD}	Plastic body for 10 s	260	°C
M_d	Mounting torque (TO-3P, TO-247)	1.13/10	Nm/lb.in.
Weight	TO-3P	5.5	g
	TO-247	6.0	g
	TO-268	5.0	g

Symbol (T_J = 25°C, unless otherwise specified)	Test Conditions	Characteristic Values Min.	Typ.	Max.	
BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	200			V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, I_D = 250μA	2.5		5.0	V
I_{GSS}	V_{GS} = ±20 V_{DC}, V_{DS} = 0			±100	nA
I_{DSS}	$V_{DS} = V_{DSS}$, V_{GS} = 0 V			25	μA
	T_J = 150°C			250	μA
$R_{DS(on)}$	V_{GS} = 10 V, $I_D = 0.5\ I_{D25}$, Pulse test, t ≤300 μs, duty cycle d ≤ 2 %			24	mΩ

Features

- International standard packages
- Unclamped Inductive Switching (UIS) rated
- Low package inductance
  - easy to drive and to protect

Advantages

- Easy to mount
- Space savings
- High power density

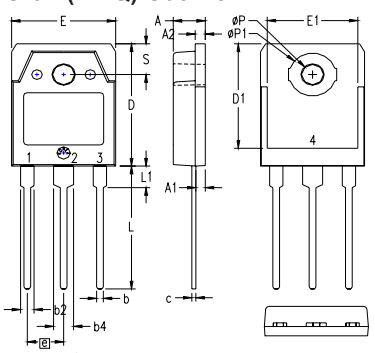
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Symbol	Test Conditions	Characteristic Values (T_J = 25° C, unless otherwise specified) Min.	Typ.	Max.	
g_{fs}	V_{DS}= 10 V; I_D = 0.5 I_{D25}, pulse test	40	52		S
C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		4800		pF
C_{oss}			1020		pF
C_{rss}			270		pF
$t_{d(on)}$	V_{GS} = 10 V, V_{DS} = 0.5 V_{DSS}, I_D = I_{D25} R_G = 4 Ω (External)		28		ns
t_r			30		ns
$t_{d(off)}$			75		ns
t_f			30		ns
$Q_{g(on)}$	V_{GS}= 10 V, V_{DS} = 0.5 V_{DSS}, I_D = 0.5 I_{D25}		145		nC
Q_{gs}			30		nC
Q_{gd}			80		nC
R_{thJC}				0.25	° C/W
R_{thCS}	(TO-3P, TO-247)		0.21		° C/W

Source-Drain Diode

Symbol	Test Conditions	Characteristic Values (T_J = 25° C, unless otherwise specified) Min.	Typ.	Max.	
I_S	V_{GS} = 0 V			96	A
I_{SM}	Repetitive			240	A
V_{SD}	I_F = I_S, V_{GS} = 0 V, Pulse test, t ≤300 µs, duty cycle d≤ 2 %			1.5	V
t_{rr}	I_F = 25 A, -di/dt = 100 A/µs		160		ns
Q_{RM}	V_R = 100 V, V_{GS} = 0 V		3.0		µC

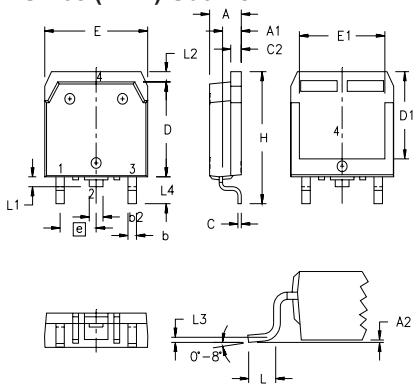
TO-3P (IXTQ) Outline



1 – GATE
2 – DRAIN (COLLECTOR)
3 – SOURCE (EMITTER)
4 – DRAIN (COLLECTOR)

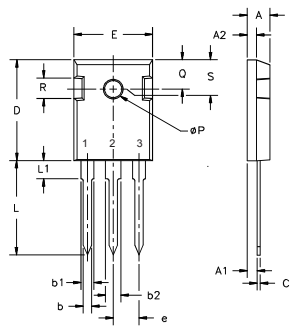
SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.185	.193	4.70	4.90
A1	.051	.059	1.30	1.50
A2	.057	.065	1.45	1.65
b	.035	.045	0.90	1.15
b2	.075	.087	1.90	2.20
b4	.114	.126	2.90	3.20
c	.022	.031	0.55	0.80
D	.780	.799	19.80	20.30
D1	.665	.677	16.90	17.20
E	.610	.622	15.50	15.80
E1	.531	.539	13.50	13.70
e	.215 BSC		5.45 BSC	
L	.779	.795	19.80	20.20
L1	.134	.142	3.40	3.60
øP	.126	.134	3.20	3.40
øP1	.272	.280	6.90	7.10
S	.193	.201	4.90	5.10

TO-268 (IXTT) Outline



SYM	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	.193	.201	4.90	5.10
A1	.106	.114	2.70	2.90
A2	.001	.010	0.02	0.25
b	.045	.057	1.15	1.45
b2	.075	.083	1.90	2.10
C	.016	.026	0.40	0.65
C2	.057	.063	1.45	1.60
D	.543	.551	13.80	14.00
D1	.488	.500	12.40	12.70
E	.624	.632	15.85	16.05
E1	.524	.535	13.30	13.60
e	.215 BSC		5.45 BSC	
H	.736	.752	18.70	19.10
L	.094	.106	2.40	2.70
L1	.047	.055	1.20	1.40
L2	.039	.045	1.00	1.15
L3	.010 BSC		0.25 BSC	
L4	.150	.161	3.80	4.10

TO-247 (IXTH) Outline



Terminals: 1 - Gate 2 - Drain
3 - Source Tab - Drain

Dim.	Millimeter Min.	Millimeter Max.	Inches Min.	Inches Max.
A	4.7	5.3	.185	.209
A_1	2.2	2.54	.087	.102
A_2	2.2	2.6	.059	.098
b	1.0	1.4	.040	.055
b_1	1.65	2.13	.065	.084
b_2	2.87	3.12	.113	.123
C	.4	.8	.016	.031
D	20.80	21.46	.819	.845
E	15.75	16.26	.610	.640
e	5.20	5.72	0.205	0.225
L	19.81	20.32	.780	.800
L1		4.50		.177
ØP	3.55	3.65	.140	.144
Q	5.89	6.40	0.232	0.252
R	4.32	5.49	.170	.216
S	6.15 BSC		242 BSC	

IXYS reserves the right to change limits, test conditions, and dimensions.

IXYS MOSFETs and IGBTs are covered by one or moreof the following U.S. patents: 4,835,592 4,850,072 4,881,106 4,931,844 5,017,508 5,034,796 5,049,961 5,063,307 5,187,117 5,237,481 5,381,025 5,486,715 6,162,665 6,259,123 B1 6,306,728 B1 6,404,065 B1 6,534,343 6,583,505 6,683,344 6,710,405B2 6,710,463 6,727,585 6,759,692 6771478 B2

Fig. 1. Output Characteristics @ 25ºC

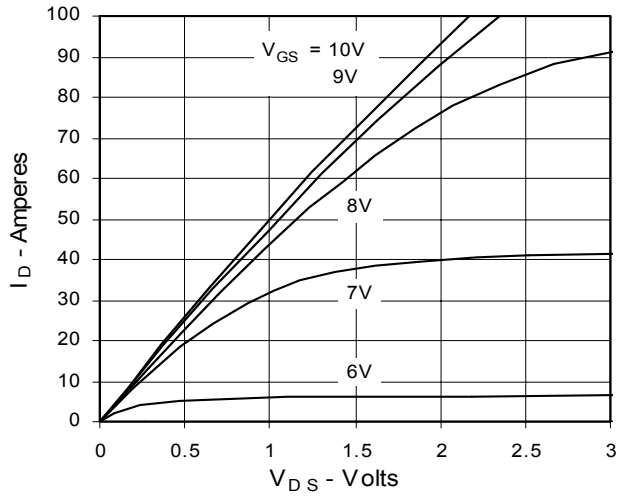


Fig. 2. Extended Output Characteristics @ 25ºC

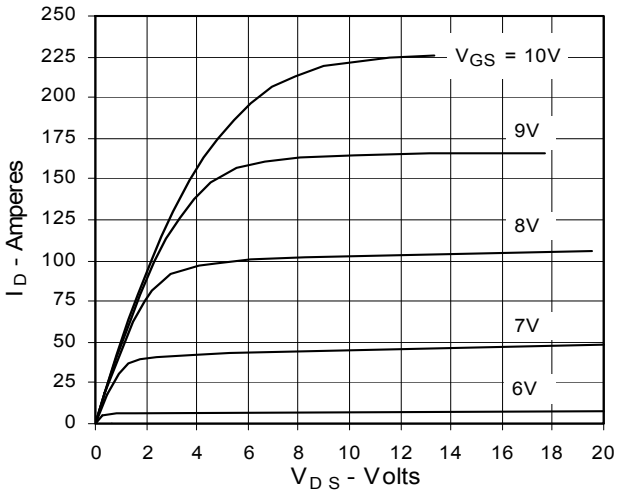


Fig. 3. Output Characteristics @ 150ºC

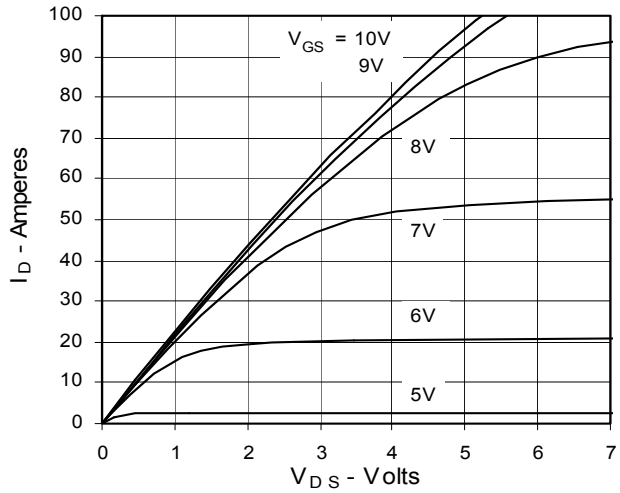


Fig. 4. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. Junction Temperature

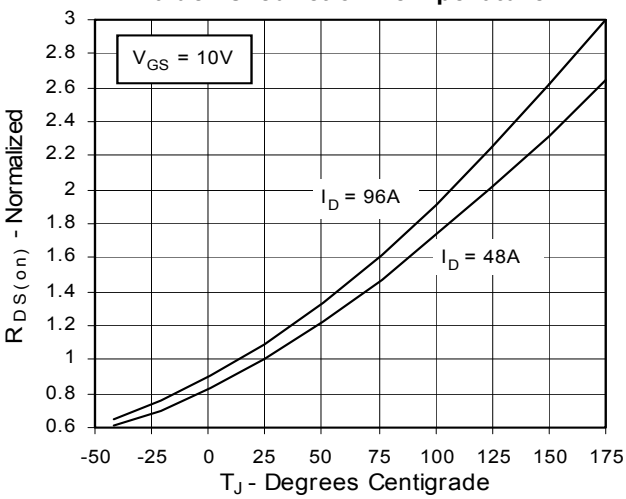


Fig. 5. $R_{DS(on)}$ Normalized to 0.5 I_{D25} Value vs. I_D

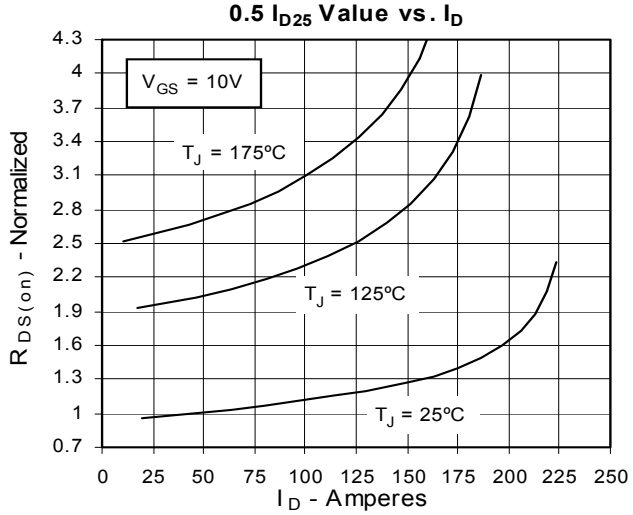
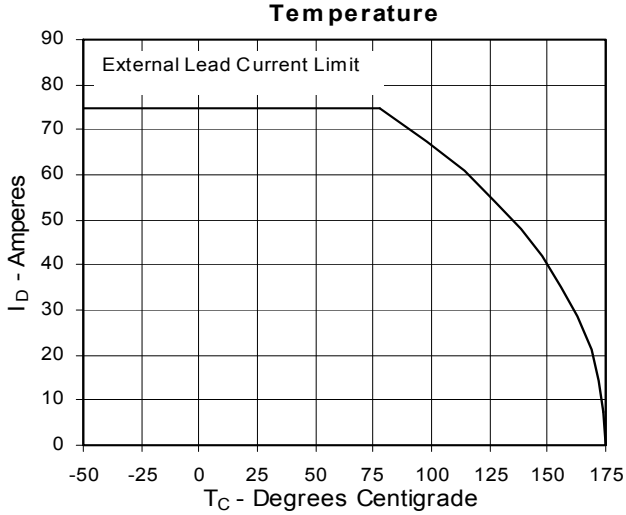


Fig. 6. Drain Current vs. Case Temperature



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Fig. 7. Input Admittance

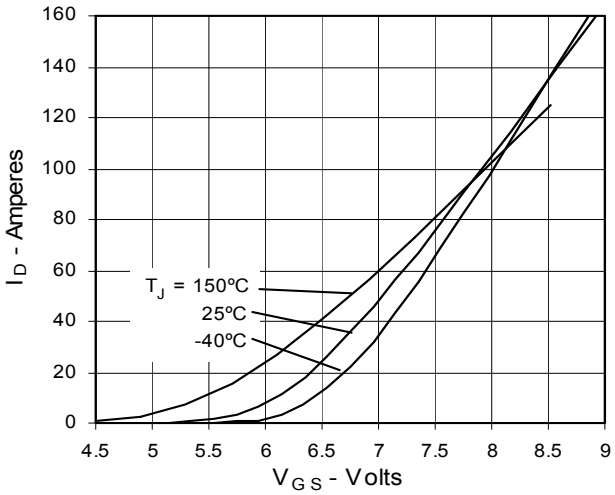


Fig. 8. Transconductance

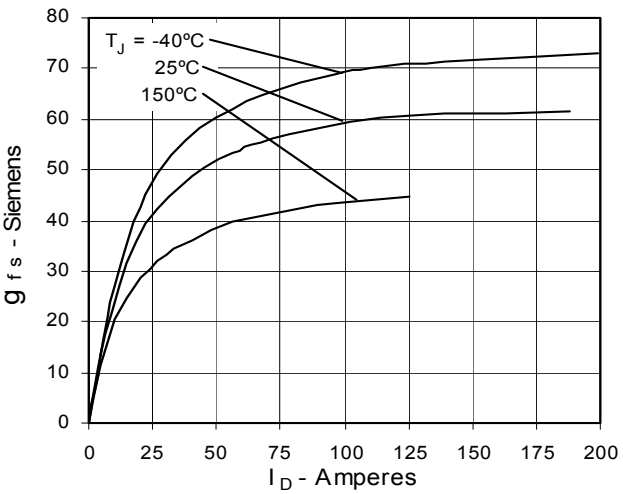


Fig. 9. Source Current vs. Source-To-Drain Voltage

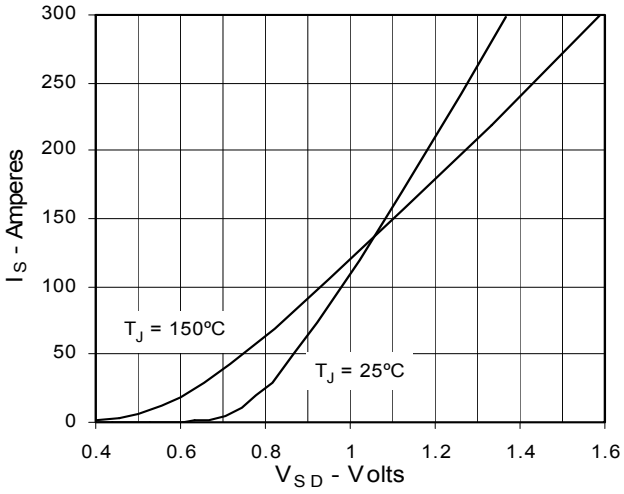


Fig. 10. Gate Charge

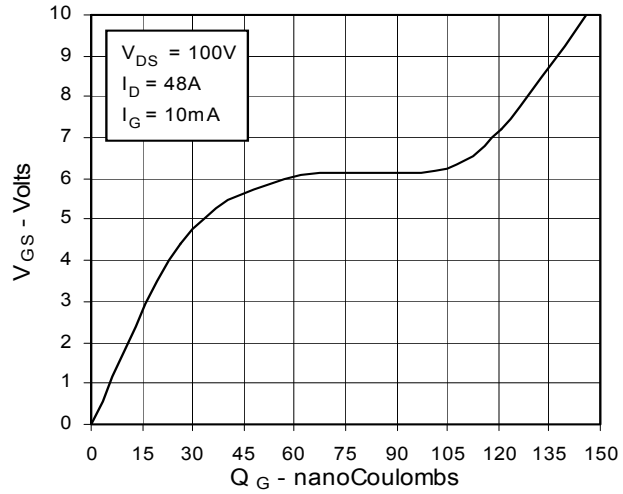


Fig. 11. Capacitance

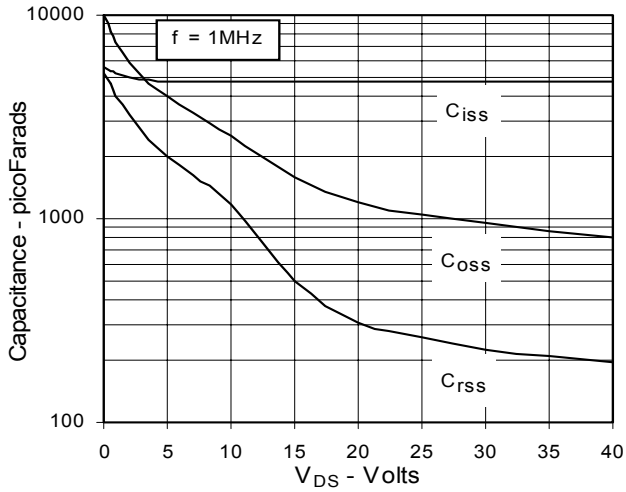
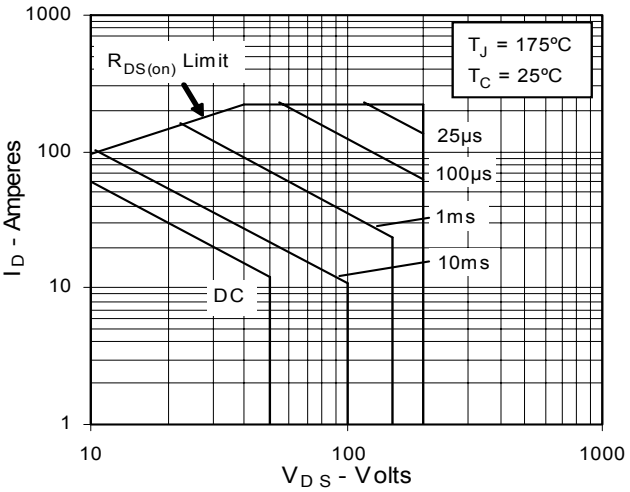
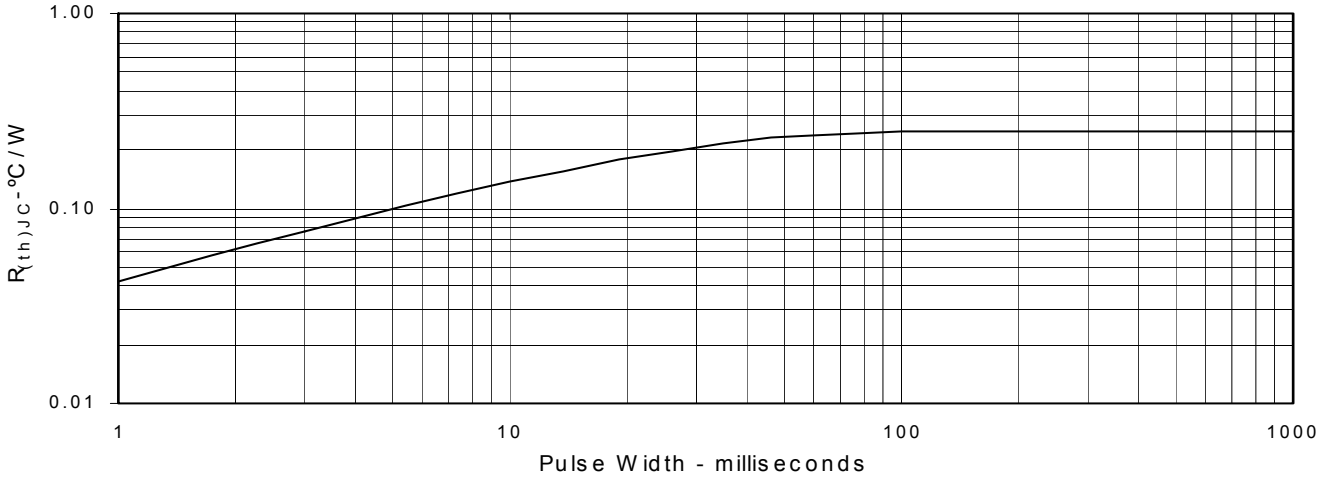


Fig. 12. Forward-Bias Safe Operating Area



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Fig. 13. Maximum Transient Thermal Resistance



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