H5N2305PF

Silicon N Channel MOS FET
High Speed Power Switching

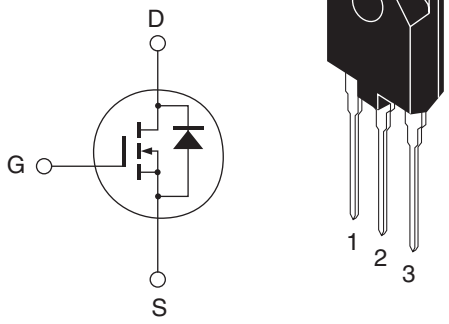
REJ03G0026-0200Z
Rev.2.00
Jun.25.2004

Features

- Low on-resistance
- Low leakage current
- High speed switching

Outline

TO-3PFM



1. Gate
2. Drain
3. Source

Absolute Maximum Rating

(Ta = 25°C)

Item	Symbol	Rating	Unit
Drain to source voltage	V_{DSS}	230	V
Gate to source voltage	V_{GSS}	±30	V
Drain current	I_D	35	A
Drain peak current	$I_{D\ (pulse)}$ Note1	140	A
Body-drain diode reverse drain current	I_{DR}	35	A
Body-drain diode reverse drain peak current	$I_{DR\ (pulse)}$ Note1	140	A
Avalanche current	I_{AP} Note3	18	A
Channel dissipation	Pch Note2	60	W
Channel to case thermal impedance	θch-c	2.08	°C /W
Channel temperature	Tch	150	°C
Storage temperature	Tstg	–55 to +150	°C

Notes: 1. PW ≤ 10 µs, duty cycle ≤ 1%
2. Value at Tc = 25°C
3. STch = 25°C, Tch ≤ 150°C

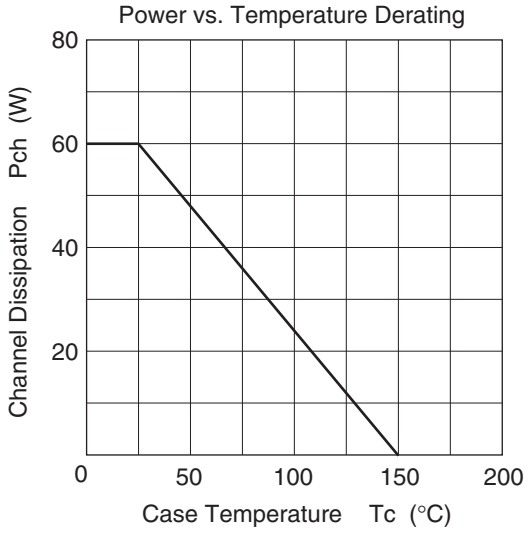
Electrical Characteristics

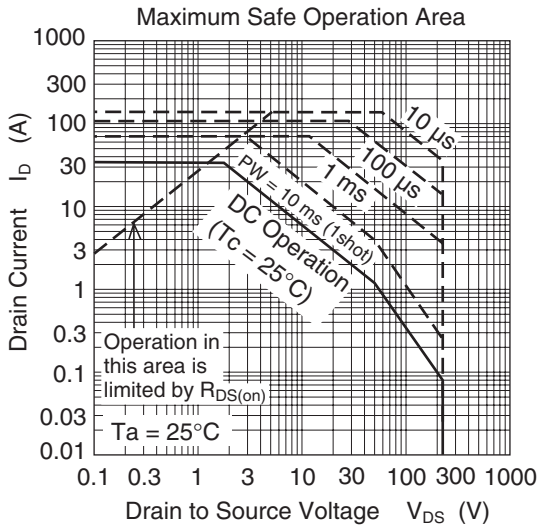
(Ta = 25°C)

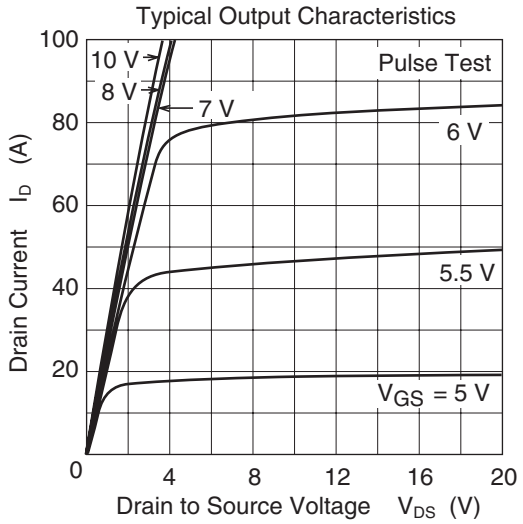
Item	Symbol	Min	Typ	Max	Unit	Test condition
Drain to Source breakdown voltage	$V_{(BR)DSS}$	230	—	—	V	I_D = 10 mA, V_{GS} = 0
Zero gate voltage drain current	I_{DSS}	—	—	1	µA	V_{DS} = 230 V, V_{GS} = 0
Gate to source leak current	I_{GSS}	—	—	±0.1	µA	V_{GS} = ±30 V, V_{DS} = 0
Gate to source cutoff voltage	$V_{GS(off)}$	2.5	—	4.0	V	V_{DS} = 10 V, I_D = 1 mA
Forward transfer admittance	|yfs|	22	38	—	S	I_D = 17.5A, V_{DS} = 10 V[Note4]
Static drain to source on state resistance	$R_{DS(on)}$	—	0.030	0.038	Ω	I_D = 17.5A, V_{GS} = 10 V[Note4]
Input capacitance	Ciss	—	5200	—	pF	V_{DS} = 25 V V_{GS} = 0 f = 1 MHz
Output capacitance	Coss	—	690	—	pF	
Reverse transfer capacitance	Crss	—	50	—	pF	
Turn-on delay time	td(on)	—	60	—	ns	I_D = 17.5 A R_L = 5.7 Ω V_{GS} = 10 V Rg = 10 Ω
Rise time	tr	—	130	—	ns	
Turn-off delay time	td(off)	—	180	—	ns	
Fall time	tf	—	120	—	ns	
Total gate charge	Qg	—	105	—	nC	V_{DD} = 160 V V_{GS} = 10 V I_D = 35 A
Gate to source charge	Qgs	—	25	—	nC	
Gate to drain charge	Qgd	—	37	—	nC	
Body-drain diode forward voltage	V_{DF}	—	0.92	1.4	V	I_F = 35 A, V_{GS} = 0[Note4]
Body-drain diode reverse recovery time	trr	—	180	—	ns	I_F = 35 A, V_{GS} = 0 diF/dt = 100 A/µs
Body-drain diode reverse recovery charge	Qrr	—	1.3	—	µC	

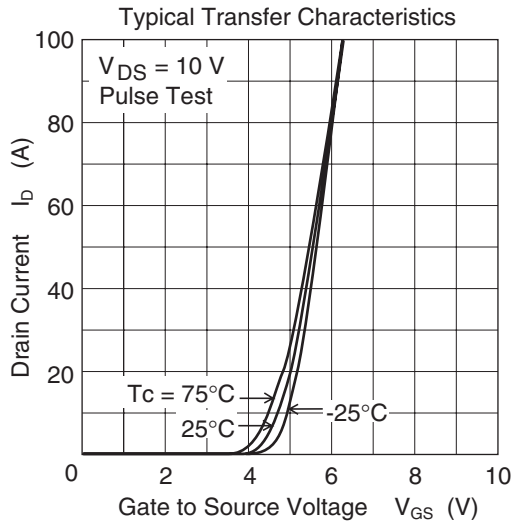
Notes: 4. Pulse test

Main Characteristics

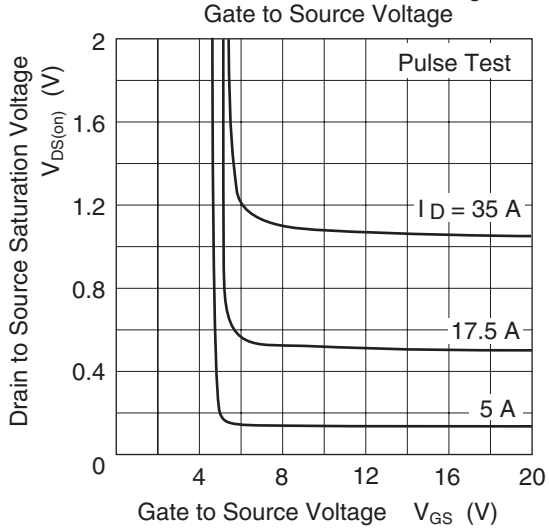




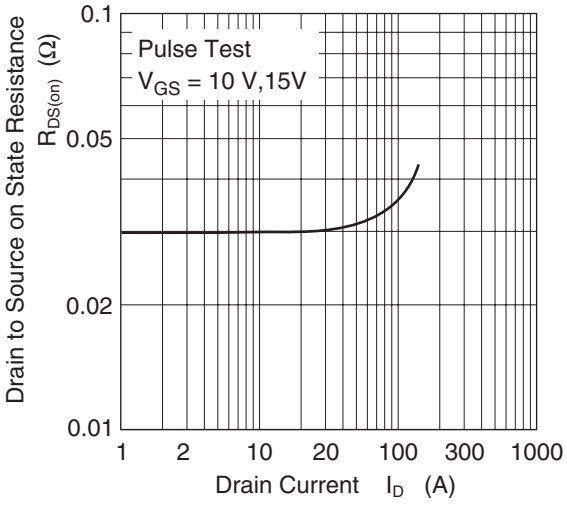




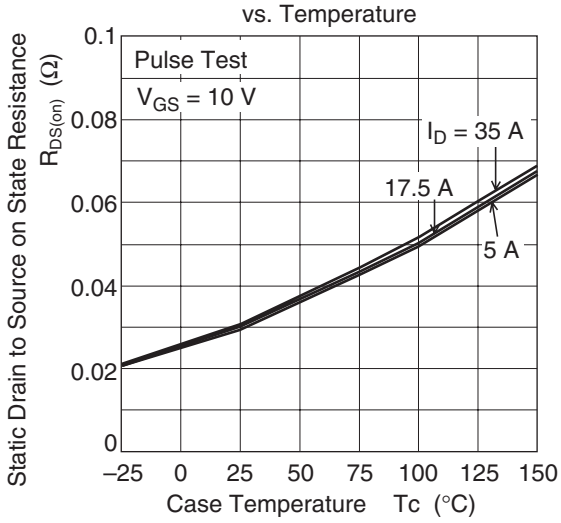
Drain to Source Saturation Voltage vs. Gate to Source Voltage



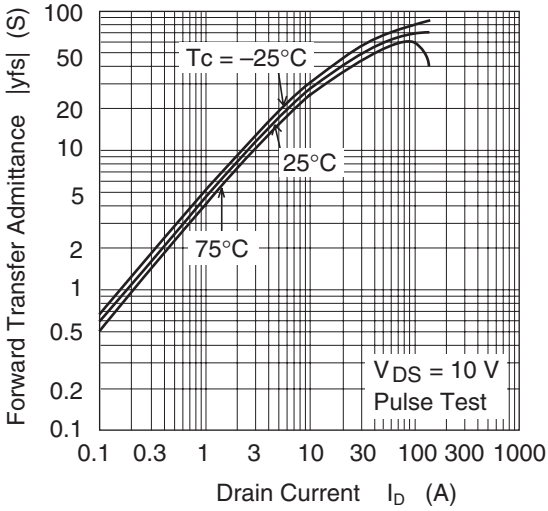
Static Drain to Source on State Resistance vs. Drain Current



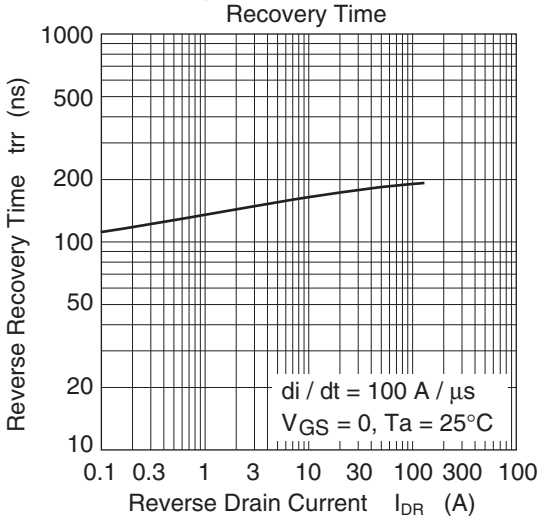
Static Drain to Source on State Resistance vs. Temperature



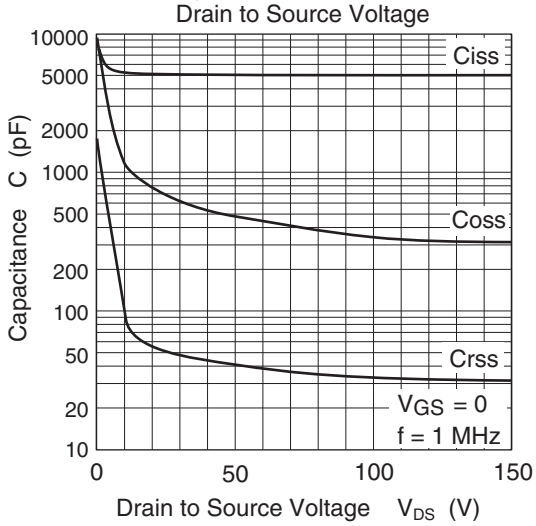
Forward Transfer Admittance vs. Drain Current



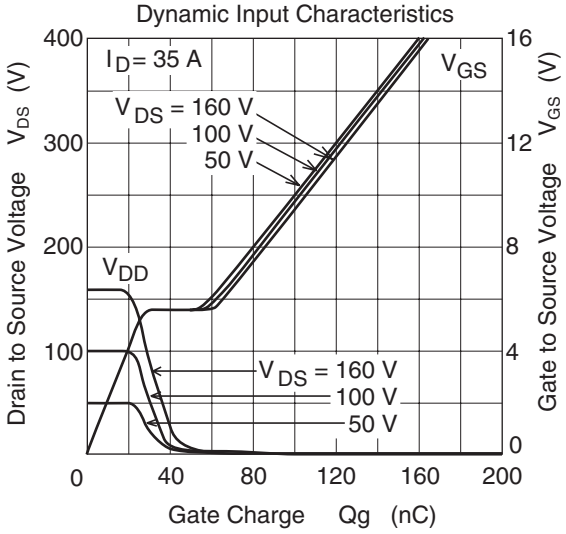
Body-Drain Diode Reverse Recovery Time



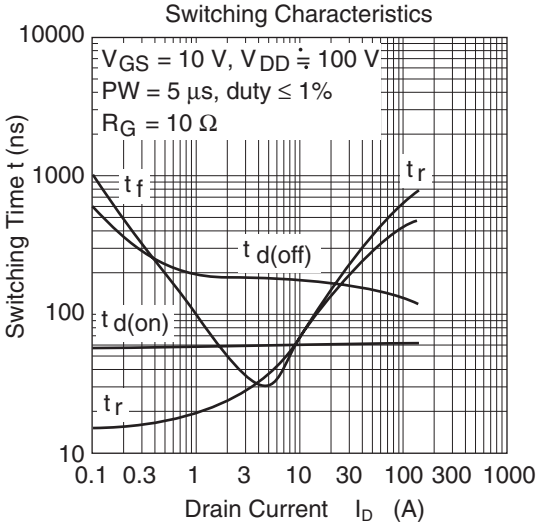
Typical Capacitance vs. Drain to Source Voltage



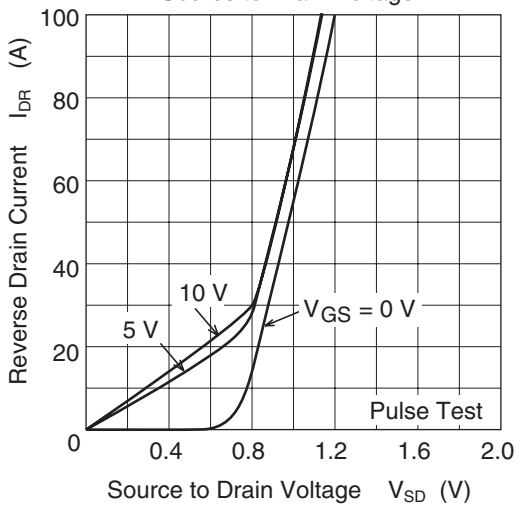
Dynamic Input Characteristics



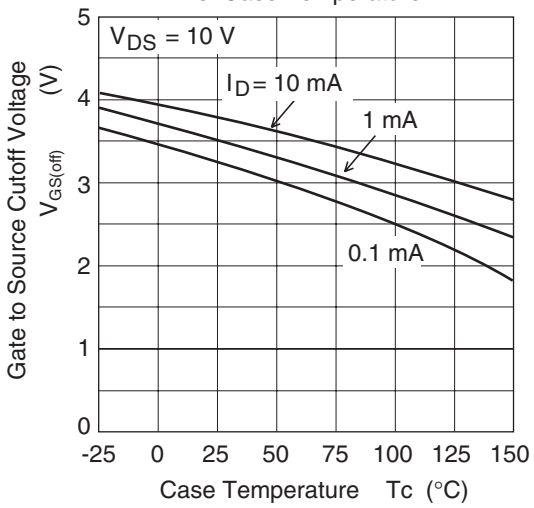
Switching Characteristics



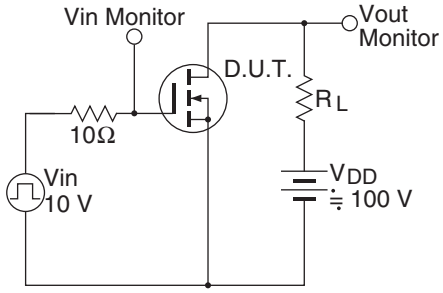
Reverse Drain Current vs.
Source to Drain Voltage



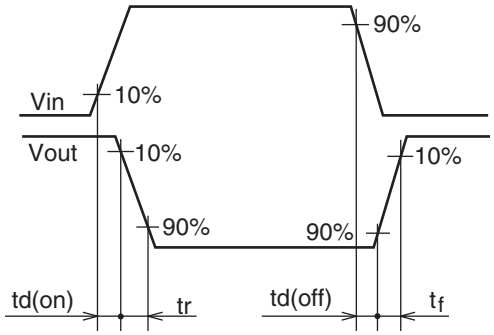
Gate to Source Cutoff Voltage
vs. Case Temperature

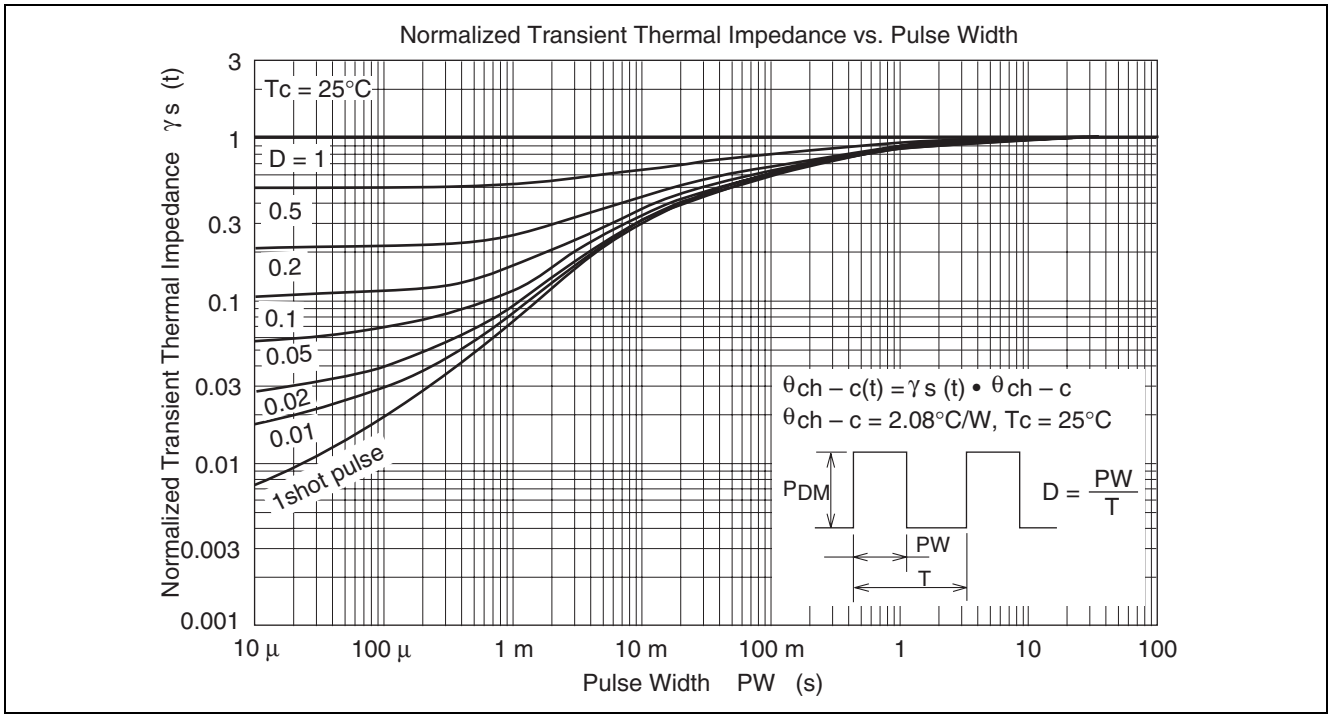


Switching Time Test Circuit



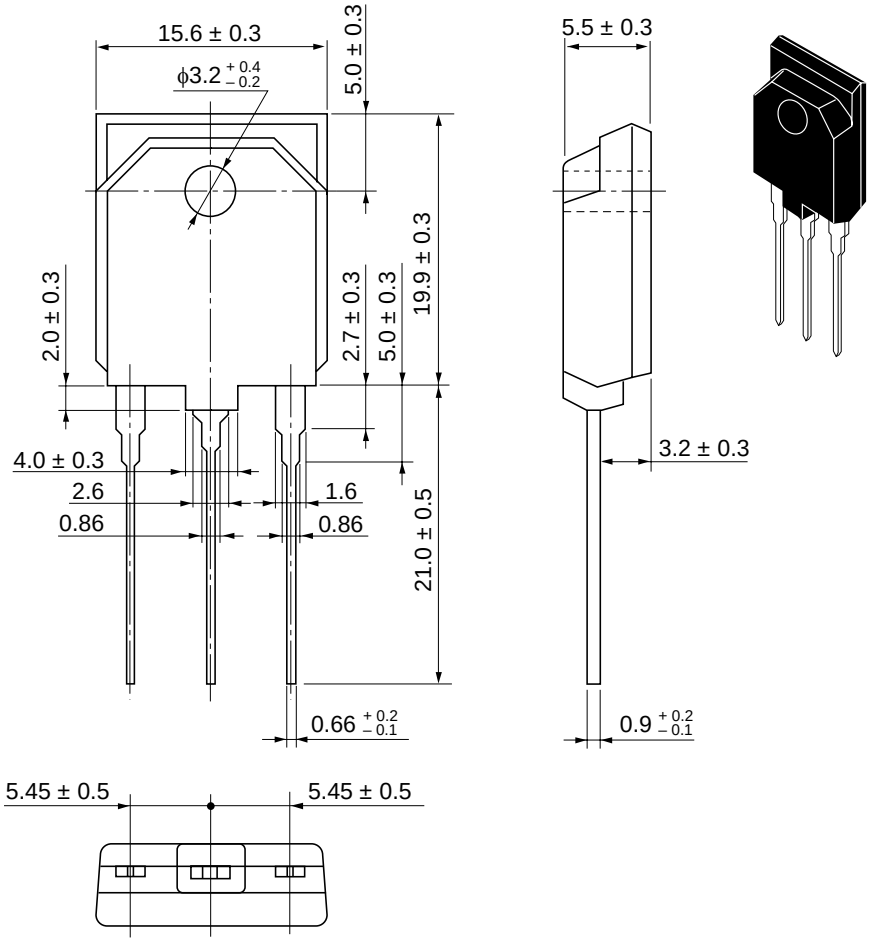
Waveform




Normalized Transient Thermal Impedance vs. Pulse Width
Tc = 25°C
D = 1
0.5
0.2
0.1
0.05
0.02
0.01
1shot pulse
θch – c(t) = γs (t) • θch – c
θch – c = 2.08°C/W, Tc = 25°C
PDM
D = PW / T
PW
T
Normalized Transient Thermal Impedance γs (t)
3
1
0.3
0.1
0.03
0.01
0.003
0.001
10 µ
100 µ
1 m
10 m
100 m
1
10
100
Pulse Width PW (s)

Package Dimensions

As of January, 2003
Unit: mm



Package Code	TO-3PFM
JEDEC	—
JEITA	—
Mass (reference value)	5.2 g

Ordering Information

Part Name	Quantity	Shipping Container
H5N2305PF-E	30 pcs	Plastic magazine

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