CHIPLINK N-Channel Enhancement Mode Power MOSFET

Description

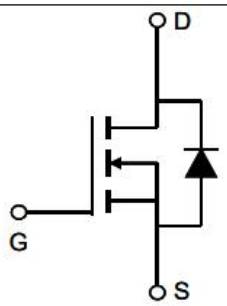
The LX3060K combines advanced trench technology to provide excellent $R_{DS(ON)}$, it is tailored to minimize conduction loss, and provide superior switching performance. It can be used in a wide variety of applications.

Features

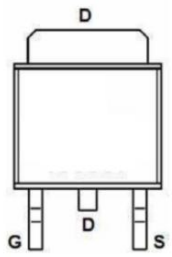
- V_{DS}=30V, I_D=60A
  $R_{DS(ON)typ.}$ =5.8mΩ@V_{GS}=10V
  $R_{DS(ON)typ.}$ =10mΩ@V_{GS}=4.5V
- Fast Switching
- High Power and Current Handing Capability
- Termination is Lead-Free and RoHS Compliant

Applications

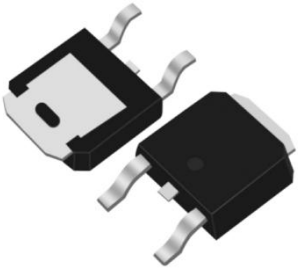
- PWM Applications
- Load Switch
- Power Management



Schematic Diagram



Pin Assignment



TO252 Package

Maximum Ratings

(T_A = 25℃ unless otherwise noted)

PARAMETER	SYMBOL	MAX	UNIT
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D(T_C=25℃)	60	A
	I_D(T_C=100℃)	40	A
Pulsed Drain Current[BC]	I_{DM}	92	A
Maximum Power Dissipation[A]	P_D	29	W
Single Pulse Avalanche Energy[D]	E_{AS}	58	mJ
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	℃

Thermal Characteristic

PARAMETER	SYMBOL	MAX	UNIT
Thermal Resistance, Junction to Case	$R_{\theta JC}$	4.32	℃/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	62.5	℃/W

Electrical Characteristics

(T_A = 25℃ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250μA	30			V
Gate-Threshold Voltage	$V_{th(GS)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	2.5	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V			1	μA
Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 25A		5.8	7.5	mΩ
		V_{GS} = 4.5V, I_D = 15A		10	14	mΩ
Forward Transconductance	g_{FS}	V_{DS} = 5V, I_D = 15A	10			S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{GS} = 0V, F = 1MHz		1140		pF
Output Capacitance	C_{oss}			175		
Reverse Transfer Capacitance	C_{rss}			151		
Switching Capacitance						
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15V, I_D = 5A, V_{GS} = 10V, R_{GEN} = 3.3Ω		15		ns
Turn-On Rise Time	t_r			19		ns
Turn-Off Delay Time	$t_{d(off)}$			35		ns
Turn-Off Fall Time	t_f			21		ns
Total Gate Charge	Q_g	V_{DS} = 15V, I_D = 5A, V_{GS} = 4.5V		9.2		nC
Gate-Source Charge	Q_{gs}			3		nC
Gate-Drain Charge	Q_{gd}			5		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_D = 5A			1.2	V
Diode Forward Current	I_S				60	A

Notes:

A. The Power dissipation P_D is based on $T_{J(MAX)}$=150℃, using≤10s junction-to-ambient thermal resistance.

B. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃. Ratings are based on low frequency and duty cycles to keep initial T_J=25℃.

C. The Static characteristics in Figures are obtained using<300μs pulses, duty cycle 2% max.

D. E_{AS} condition: T_J=25℃, V_{DD}=15V, V_{GS}=10V, R_G=25Ω, L=0.1mH.

Typical Electrical and Thermal Characteristics

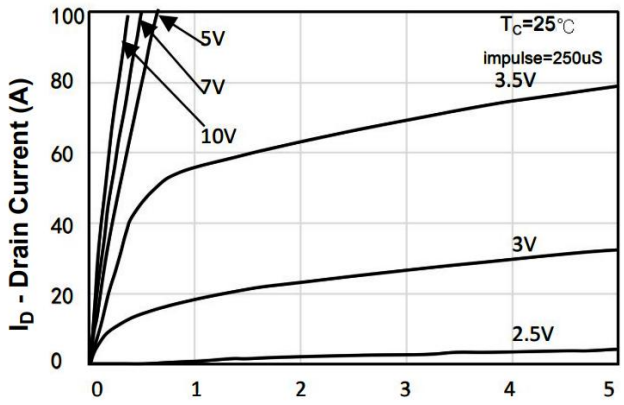


Figure 1. On-Region Characteristics

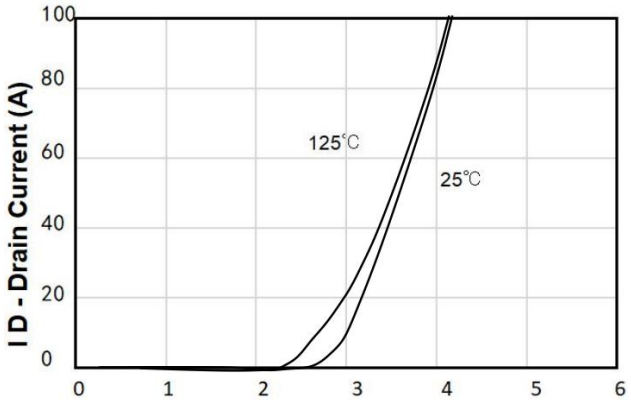


Figure 2. Transfer Characteristics

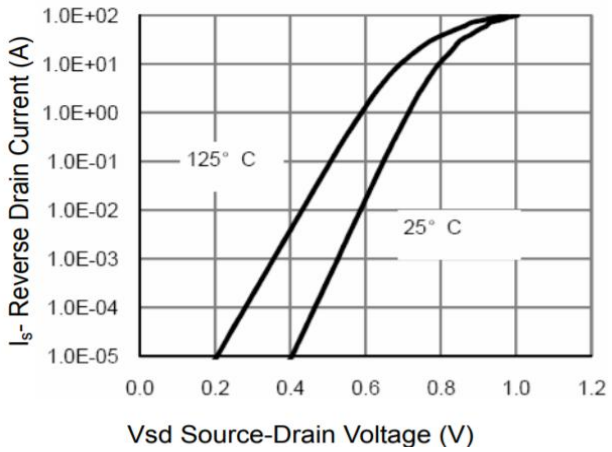


Figure 3. Body Diode Characteristics

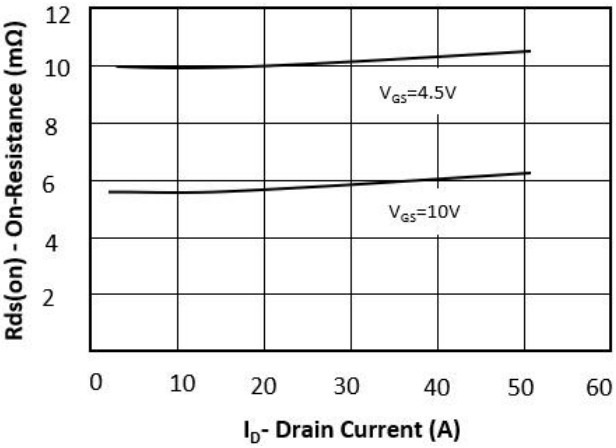


Figure 4. On-Resistance vs. Drain Current

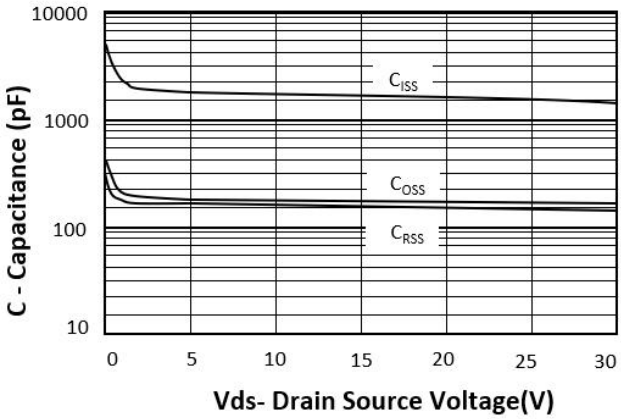


Figure 5. Gate Charge Characteristics

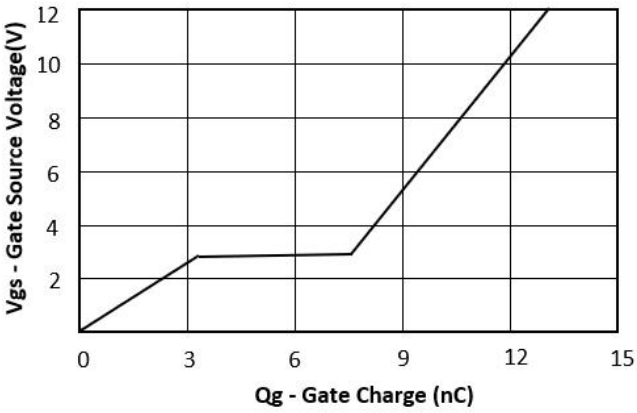


Figure 6. Capacitance Characteristics

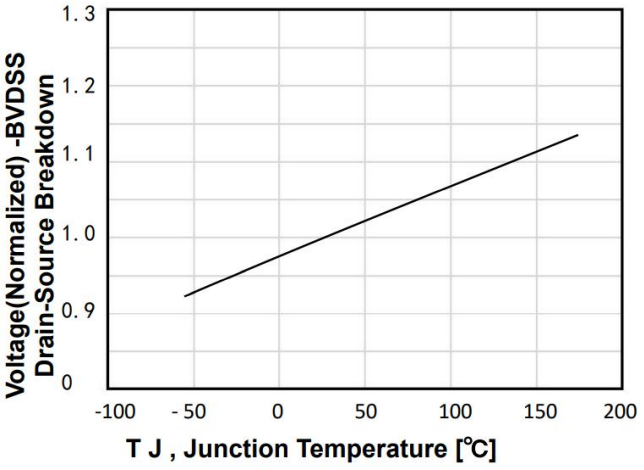


Figure 7. Breakdown Voltage vs. Temperature

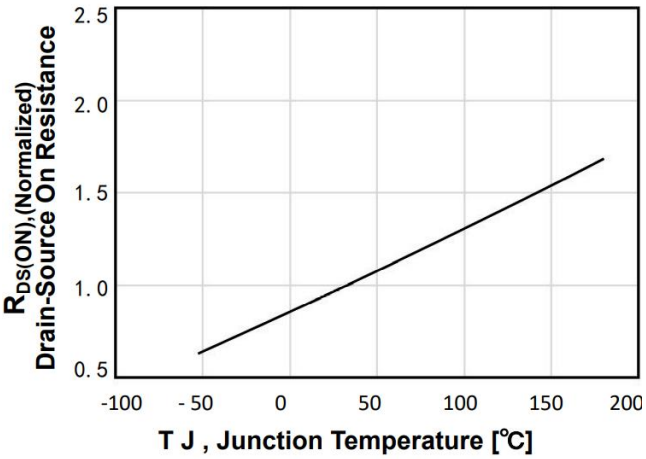


Figure 8. On-Resistance Variation vs. Temperature

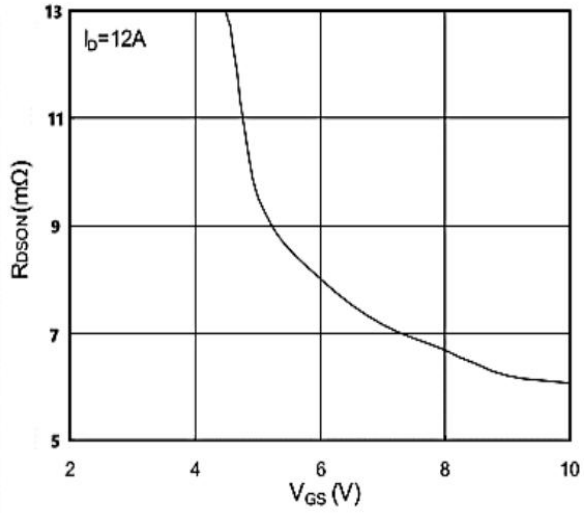


Figure 9. On-Resistance vs. VGS

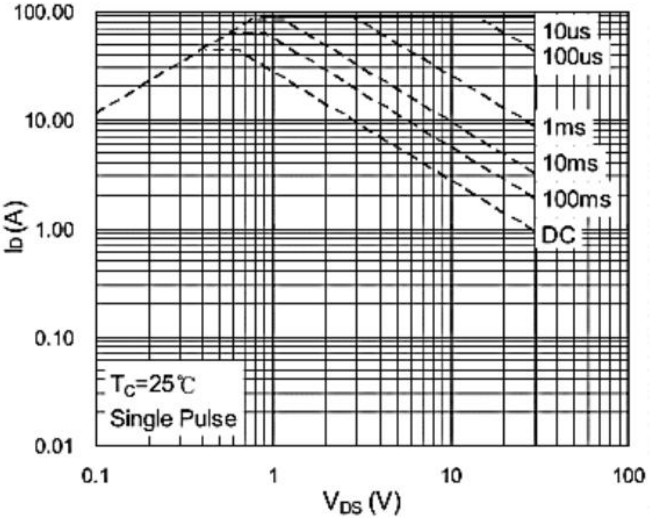


Figure 10. Safe Operation Area

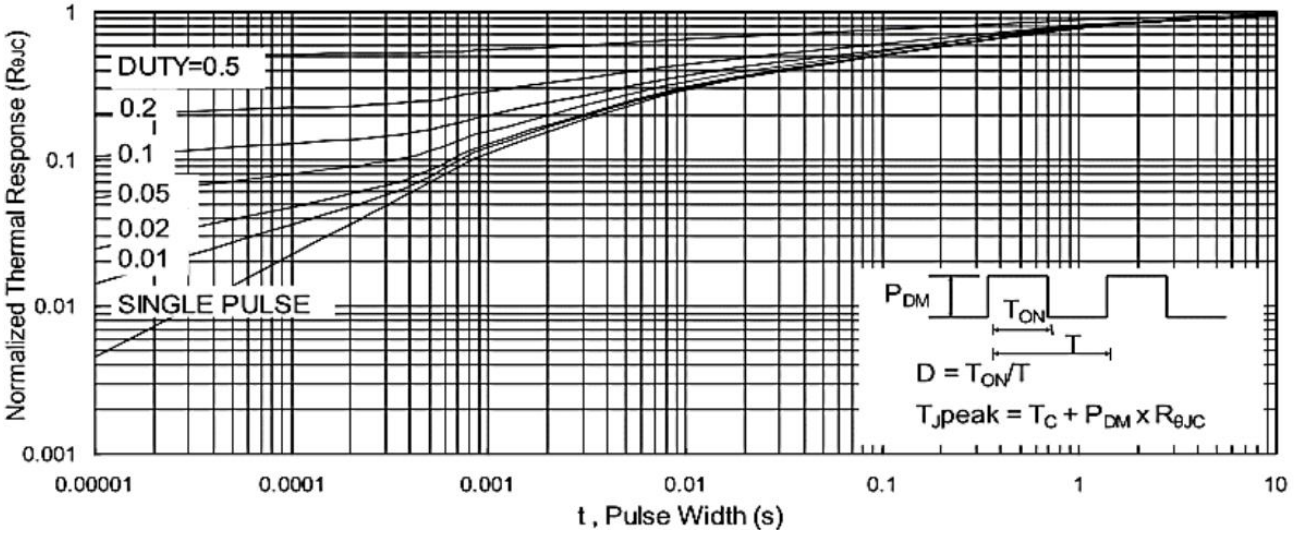


Figure 11. Normalized Maximum Transient Thermal Impedance

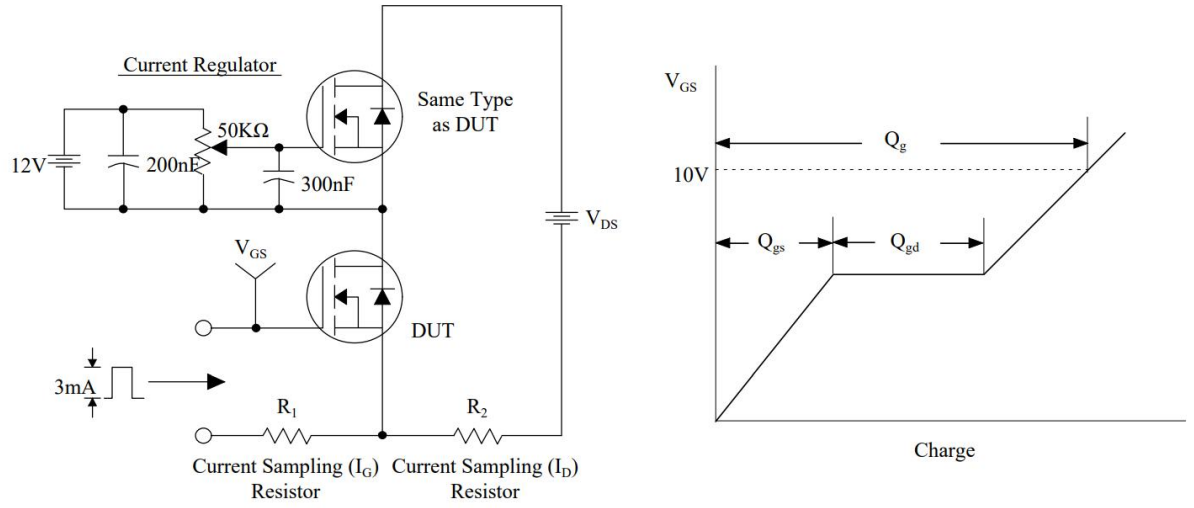


Figure 12. Gate Charge Test Circuit & Waveform

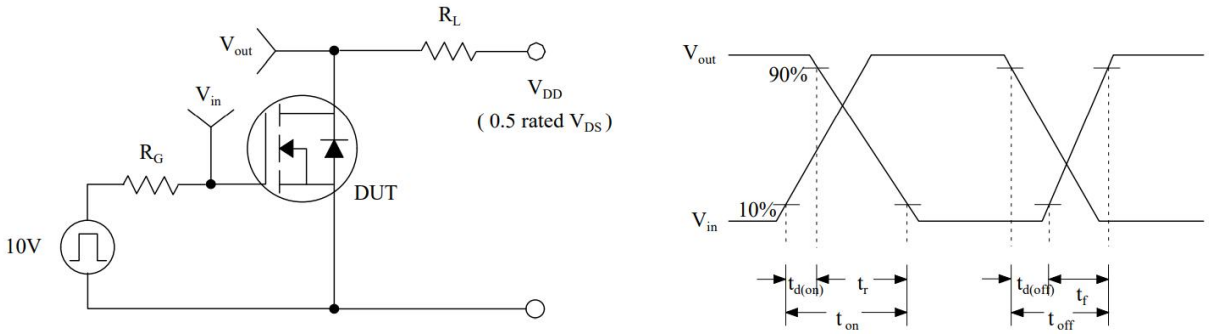


Figure 13. Resistive Switching Test Circuit & Waveforms

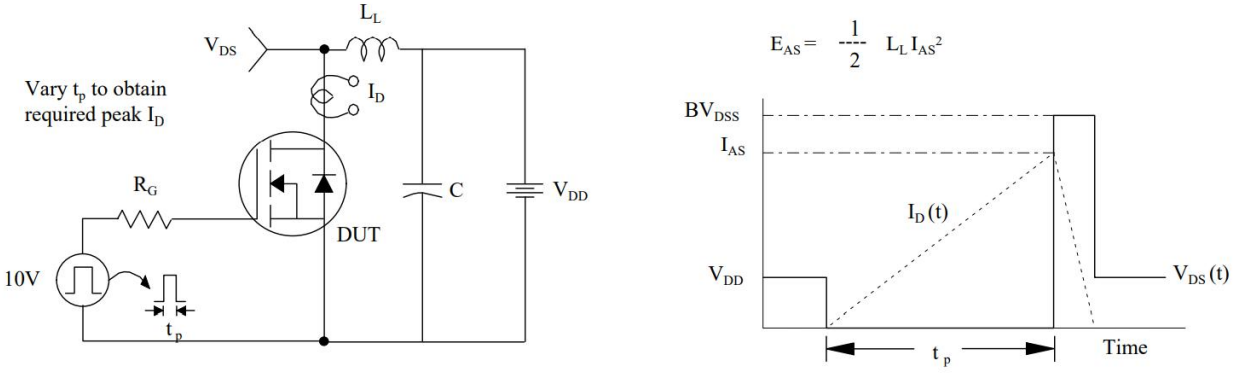
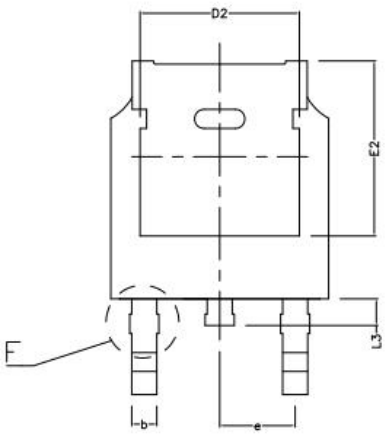
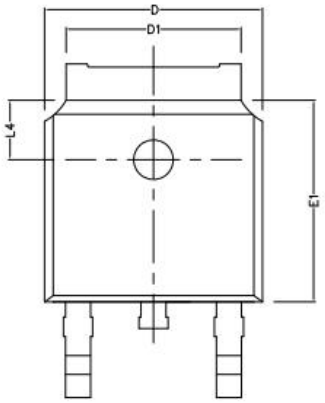


Figure 14. Unclamped Inductive Switching Test Circuit & Waveforms

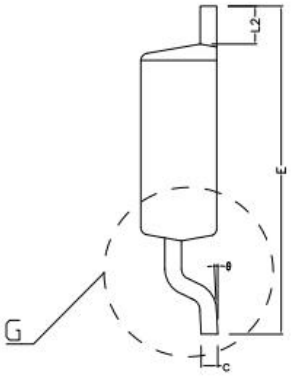
TO252 Package Information



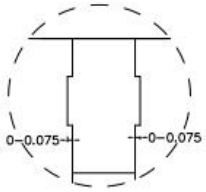
BOTTOM VIEW



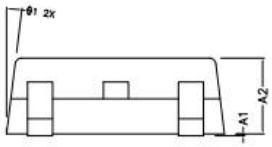
TOP VIEW



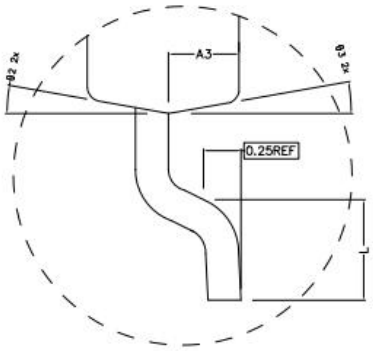
SIDE VIEW



DETAIL F



SIDE VIEW



DETAIL G

	MIN	NORMAL	MAX		MIN	NORMAL	MAX
A1	0.000	0.100	0.150	E2		5.600REF	
A2	2.200	2.300	2.400	e		2.286TYPE	
A3	1.020	1.070	1.120	L	1.400	1.550	1.700
b	0.710	0.760	0.810	L2		1.10REF	
c	0.460	0.508	0.550	L3		0.80REF	
D	6.500	6.600	6.700	L4		1.8REF	
D1		5.330REF		θ		0~8°	
D2		4.830REF		θ1		7° TYPE	
E	9.900	10.100	10.300	θ2		10° TYPE	
E1	6.000	6.100	6.200	θ3		10° TYPE	

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