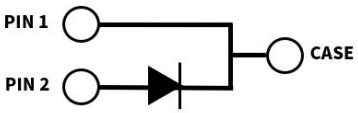
E4D20120G

1200 V, 20 A Silicon Carbide Schottky Diode

Features

- 4th generation SiC merged PIN Schottky technology
- Zero reverse recovery current
- High-frequency operation
- Temperature-independent switching behavior
- AEC-Q101 qualified and PPAP capable
- Humidity resistant

TO-263-2



Package Types: TO-263-2
PN: E4D20120G

Wolfspeed, Inc. is in the process of rebranding its products and related materials pursuant to the entity name change from Cree, Inc. to Wolfspeed, Inc. During this transition period, products received may be marked with either the Cree name and/or logo or the Wolfspeed name and/or logo.

Applications

- Boost diodes in PFC or DC/DC stages
- Free wheeling diodes in inverter stages
- AC/DC converters
- Automotive and traction power conversion
- PV inverters

Benefits

- Replace bipolar with unipolar rectifiers
- Essentially no switching losses
- Higher efficiency
- Reduction of heat sink requirements
- Parallel devices without thermal runaway
- Ideal for outdoor environments

Maximum Ratings (T_C = 25 °C Unless Otherwise Specified)

Parameter	Symbol	Value	Unit	Test Conditions	Note
Repetitive Peak Reverse Voltage	V_{RRM}	1200	V		
DC Peak Reverse Voltage	V_R	1200			
Continuous Forward Current	I_F	56	A	T_C = 25 °C	Fig. 3
		27		T_C = 135 °C	
		20		T_C = 150 °C	
Power Dissipation	P_{tot}	250	W	T_C = 25 °C	Fig. 4
		108		T_C = 110 °C	
Repetitive Peak Forward Surge Current	I_{FRM}	83	A	T_C = 25 °C, t_P = 10 ms, Half Sine Pulse	
		47		T_C = 110 °C, t_P = 10 ms, Half Sine Pulse	
Diode dV/dt Ruggedness	dV/dt	250	V/ns	V_R = 0-960 V	
Operating Junction and Storage Temperature	T_J, T_{stg}	-55 to +175	°C		

Electrical Characteristics

Parameter	Symbol	Typ.	Max.	Unit	Test Conditions	Note
Forward Voltage	V_F	1.5	1.8	V	I_F = 20 A, T_J = 25 °C	Fig. 1
		2.2			I_F = 20 A, T_J = 175 °C	
Reverse Current	I_R	35	200	µA	V_R = 1200 V, T_J = 25 °C	Fig. 2
		65			V_R = 1200 V, T_J = 175 °C	
Total Capacitive Charge	Q_C	110		nC	V_R = 800 V, I_F = 20 A	Fig. 5
					di/dt = 200 A/µs	
					T_J = 25 °C	
Total Capacitance	C	1474		pF	V_R = 0 V, T_J = 25 °C, f = 1 MHz	Fig. 6
		100			V_R = 400 V, T_J = 25 °C, f = 1 MHz	
		76			V_R = 800 V, T_J = 25 °C, f = 1 MHz	
Capacitance Stored Energy	E_C	33		µJ	V_R = 800 V	Fig. 7

Note: This is a majority carrier diode, so there is no reverse recovery charge.

Thermal Characteristics

Parameter	Symbol	Typ.	Unit	Note
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.6	°C/W	Fig. 8

Typical Performance

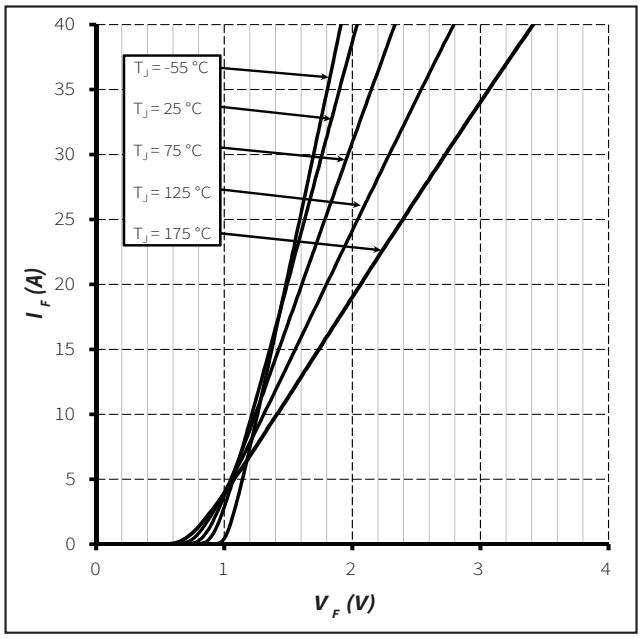


Figure 1. Forward Characteristics

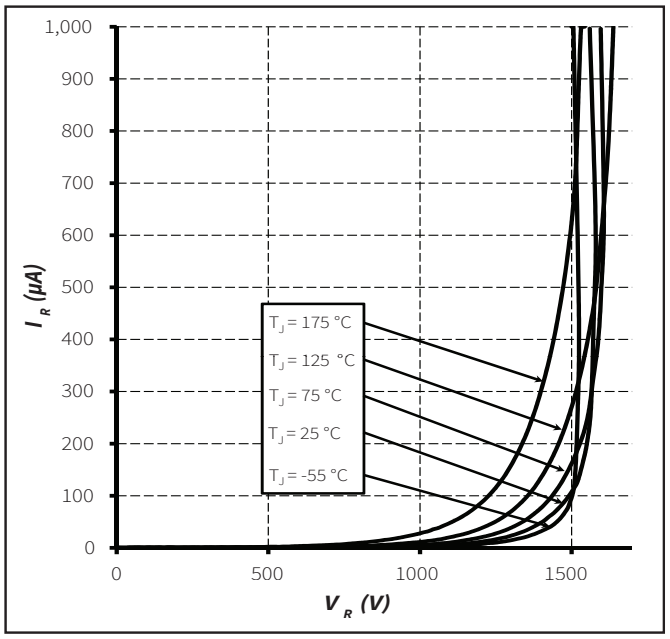


Figure 2. Reverse Characteristics

Typical Performance

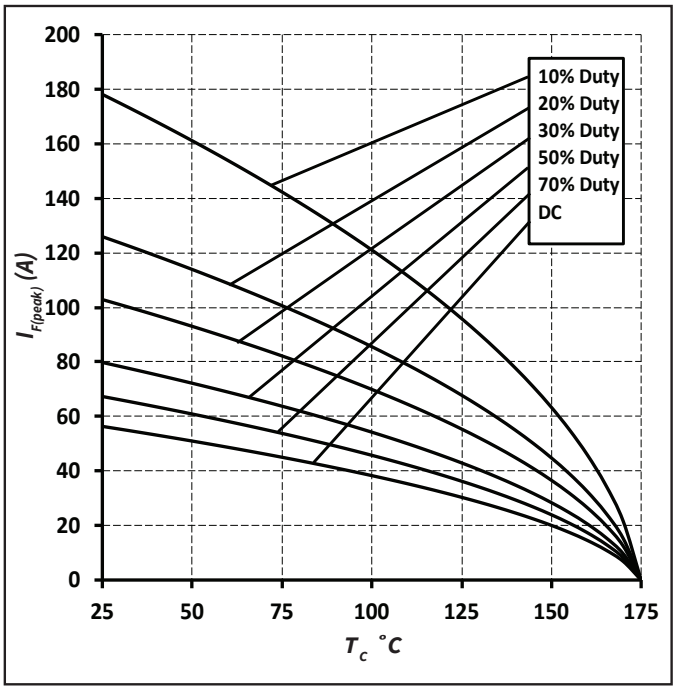


Figure 3. Current Derating

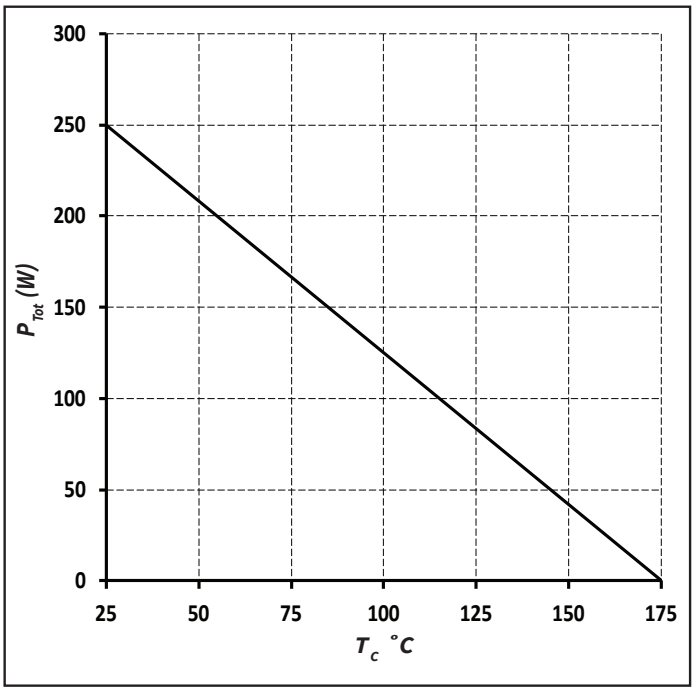


Figure 4. Power Derating

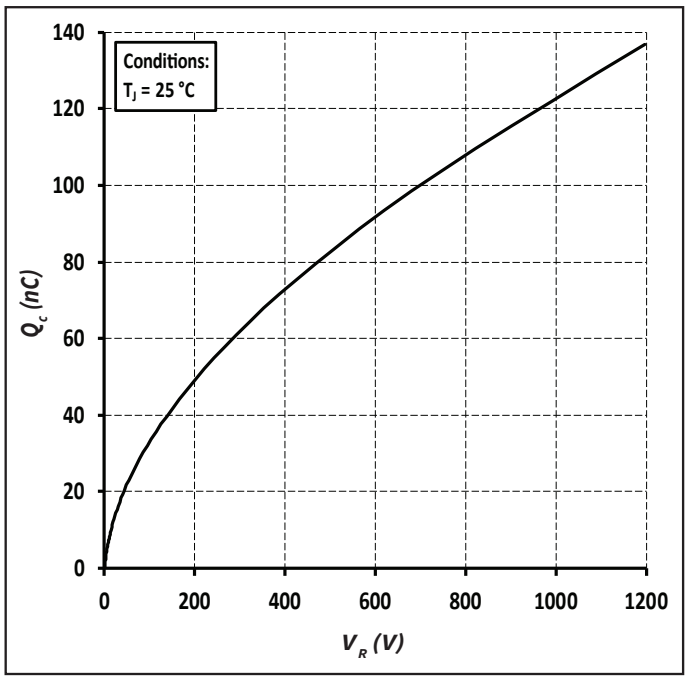


Figure 5. Recovery Charge vs. Reverse Voltage

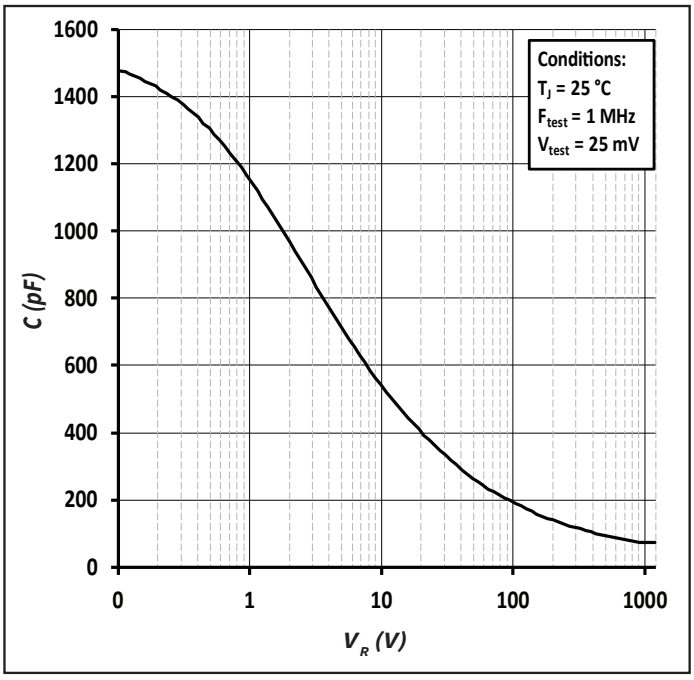


Figure 6. Capacitance vs. Reverse Voltage

Typical Performance

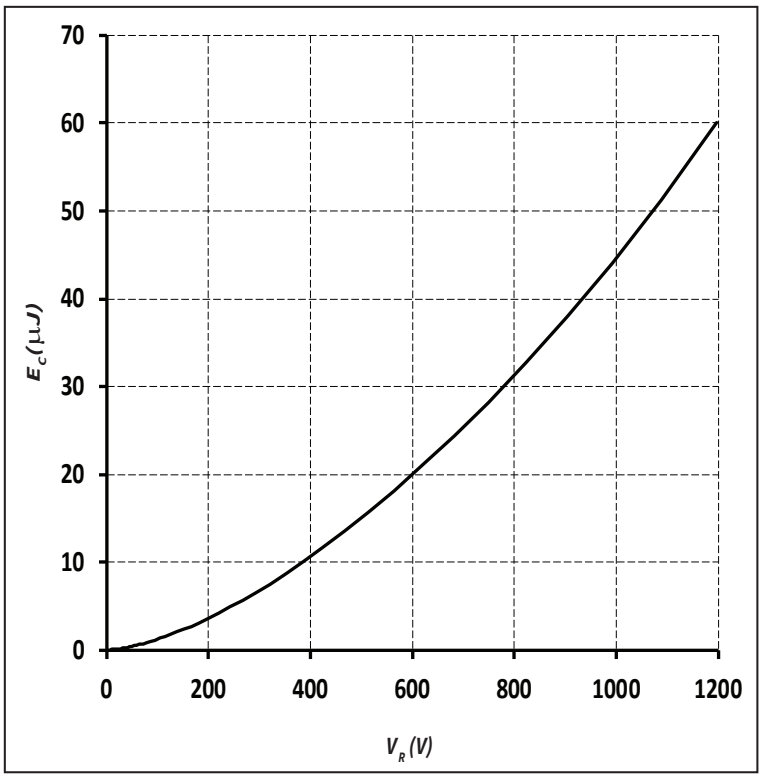


Figure 7. Typical Capacitance Stored Energy

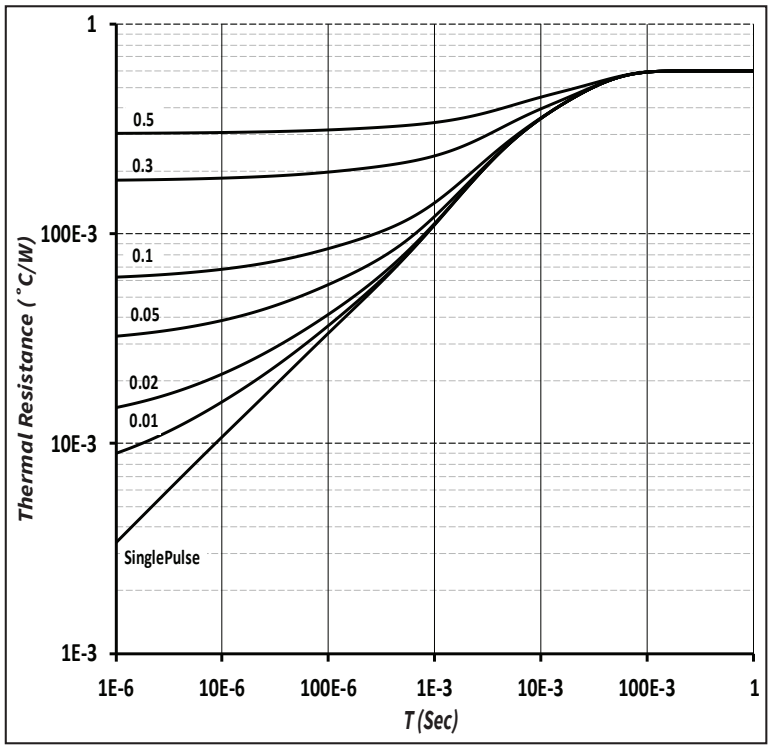
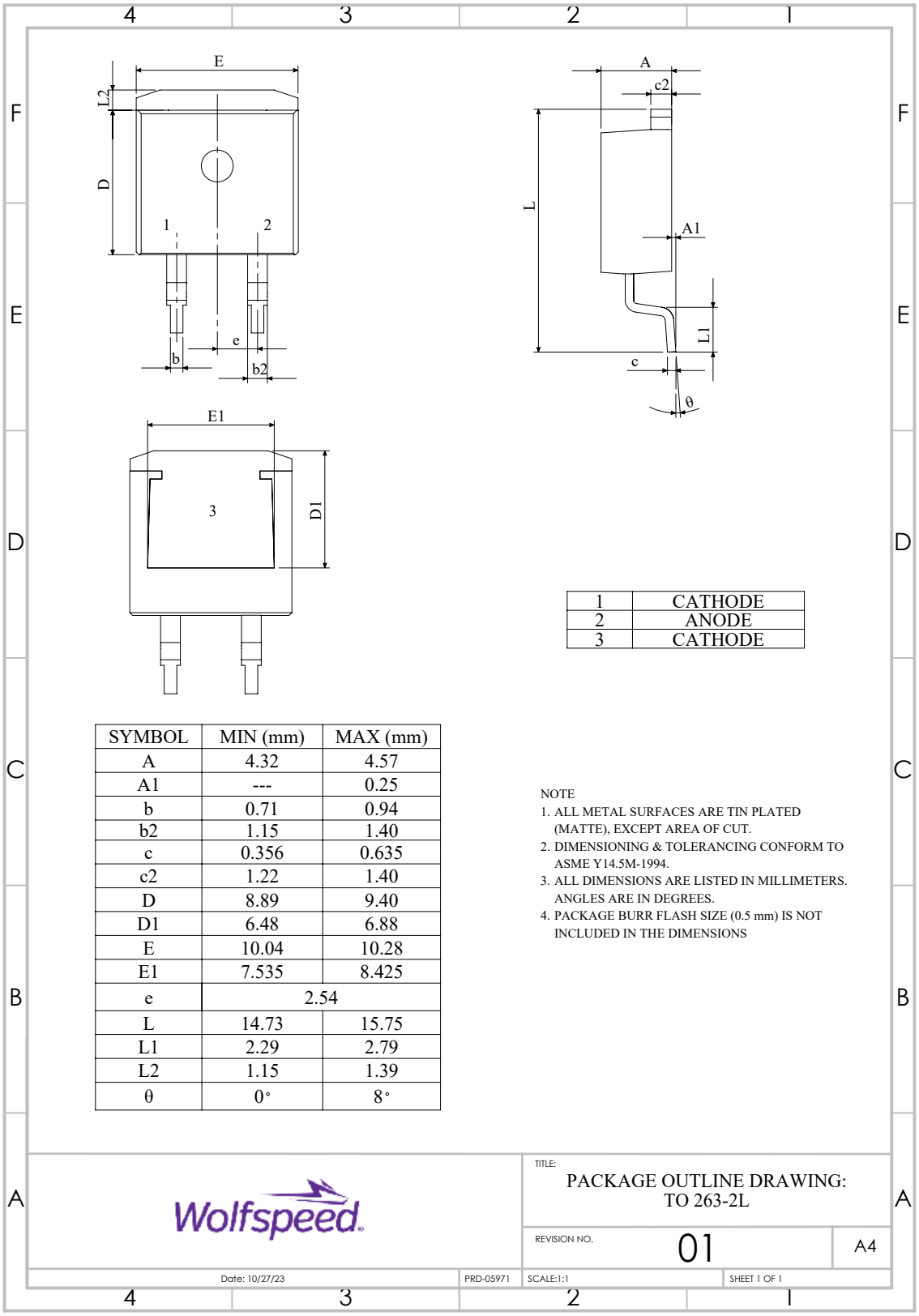


Figure 8. Transient Thermal Impedance

Package Dimensions

Package: TO-263-2



1	CATHODE
2	ANODE
3	CATHODE

SYMBOL	MIN (mm)	MAX (mm)
A	4.32	4.57
A1	---	0.25
b	0.71	0.94
b2	1.15	1.40
c	0.356	0.635
c2	1.22	1.40
D	8.89	9.40
D1	6.48	6.88
E	10.04	10.28
E1	7.535	8.425
e	2.54	
L	14.73	15.75
L1	2.29	2.79
L2	1.15	1.39
θ	0°	8°

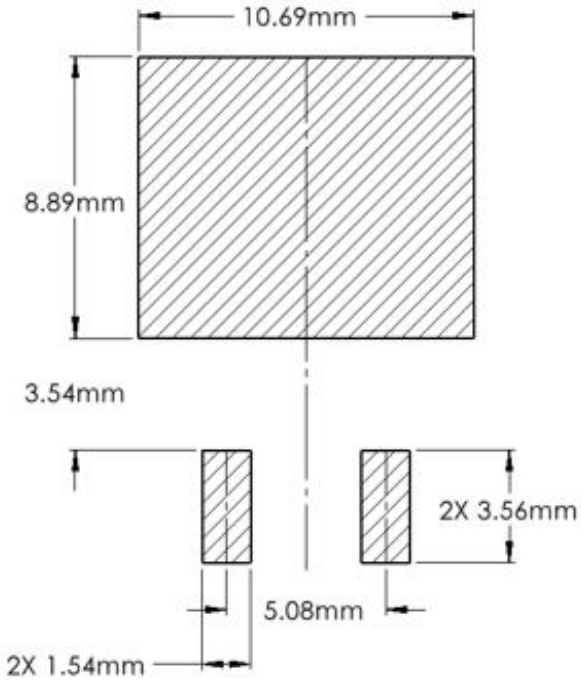
NOTE
1. ALL METAL SURFACES ARE TIN PLATED (MATTE), EXCEPT AREA OF CUT.
2. DIMENSIONING & TOLERANCING CONFORM TO ASME Y14.5M-1994.
3. ALL DIMENSIONS ARE LISTED IN MILLIMETERS. ANGLES ARE IN DEGREES.
4. PACKAGE BURR FLASH SIZE (0.5 mm) IS NOT INCLUDED IN THE DIMENSIONS

TITLE: PACKAGE OUTLINE DRAWING: TO 263-2L

REVISION NO. 01 | A4

Date: 10/27/23 | PRD-05971 | SCALE:1:1 | SHEET 1 OF 1

Recommended Solder Pad Layout



Part Number	Package	Marking
E4D20120G	TO-263-2	E4D20120

Revision History

Current Revision	Date of Release	Description of Changes
1	August-2020	Initial Release
2	October-2020	Updated Wolfspeed branding, package drawing, and solder pad layout (Not Released)
3	November-2023	Corrected Package Drawing L and L1

Notes & Disclaimer

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