

1. Description

The 15N10 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a wide variety of applications.

2. Features

- Low Total Gate Charge
- Low Reverse Transfer Capacitance

2.1 Features

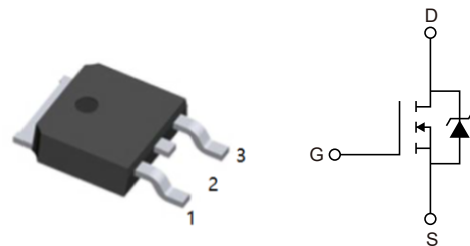
- $V_{DS(V)}=100V$
- $I_D=15A$
- $R_{DS(ON)}<95m\Omega(V_{GS}=10V)$
- $R_{DS(ON)}<100m\Omega(V_{GS}=4.5V)$

- Improved dv/dt Capability
- Fast Switching Speed

3. Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	DRAIN
3	S	SOURCE

TO-252(DPAK)
top view



4. Absolute Maximum Ratings $T_A = 25^\circ C$

Parameter		Symbol	Rating	Units
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	± 20	
Drain Current-Continuous	$T_C=25^\circ C$ ^{Note1}	I_D	15	A
	$T_C=100^\circ C$		10	
Drain Current-Pulsed ^{Note2}		I_{DM}	60	
Maximum Power Dissipation		P_D	55	W
Storage Temperature Range	$T_C=25^\circ C$	T_{STG}	-55 to 175	$^\circ C$
Operating Junction Temperature Range		T_J	-55 to 175	$^\circ C$



5. Thermal resistance rating

Parameter	Symbol	Typ	Max	Units
Thermal Resistance, Junction-to-Case	R_{thJC}		2.72	°C/W

6. Specifications ($T_J = 25^\circ\text{C}$, unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	100			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
ON CHARACTERISTIC						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _{DS} =250μA	1	1.6	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =10A		95	110	mΩ
		V _{GS} =4.5V, I _{DS} =5A		100	130	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _{DS} =4A	2			S
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz		632		pF
Output Capacitance	C _{oss}			37		pF
Reverse Transfer Capacitance	C _{rss}			21		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(on)}	V _{GS} =10V, V _{DS} =50V, R _L =2.8Ω R _{GEN} =6Ω, I _D =10A		12.6		ns
Rise Time	t _r			6		ns
Turn-Off Delay Time	t _{D(off)}			32.5		ns
Fall Time	t _f			4.3		ns
Total Gate Charge at 10V	Q _g	V _{DS} =80V, I _{DS} =10A, V _{GS} =10V		19.2		nC
Gate to Source Gate Charge	Q _{gs}			3.4		nC
Gate to Drain“Miller”Charge	Q _{gd}			6.1		nC



DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{DS}=10A$			1.2	V

Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 3. E_{AS} condition: $T_J=25^{\circ}C, V_{DD}=50V, V_G=10V, R_G=25\Omega$.



7.1 Typical Characteristics

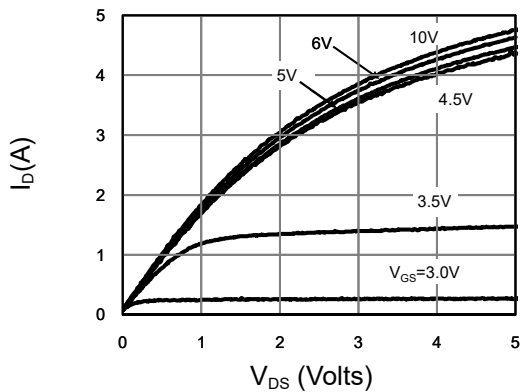


Fig 1: On-Region Characteristics (Note E)

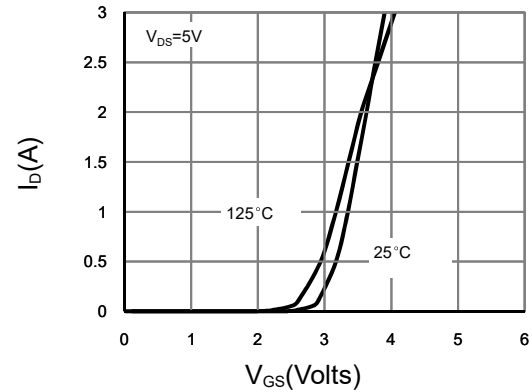


Figure 2: Transfer Characteristics (Note E)

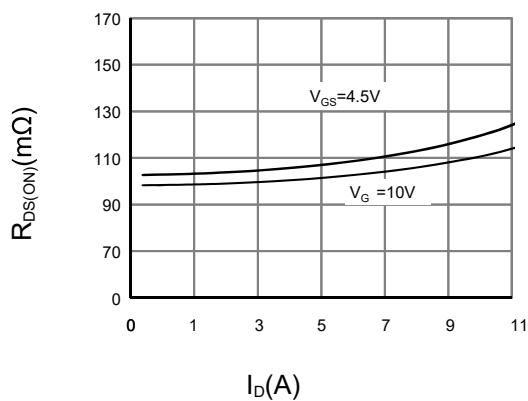


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

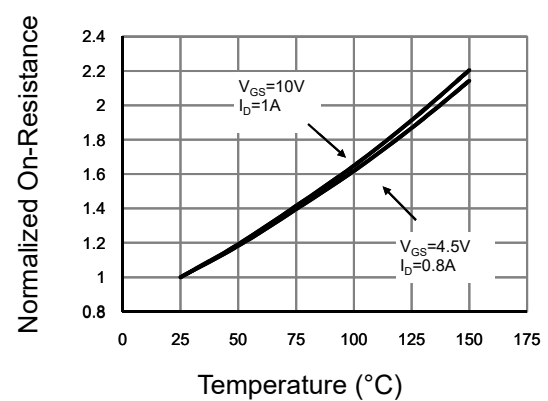


Figure 4: On-Resistance vs. Junction Temperature (Note E)

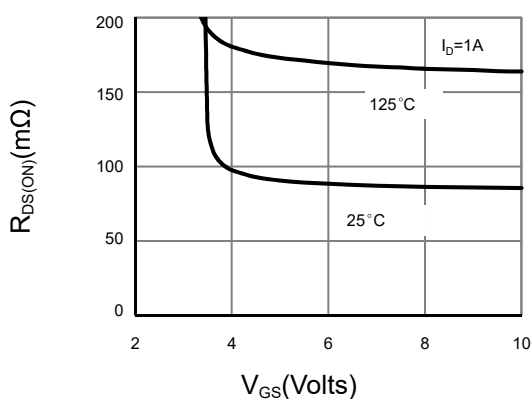


Figure 5: On-Resistance vs. Gate-Source Voltage

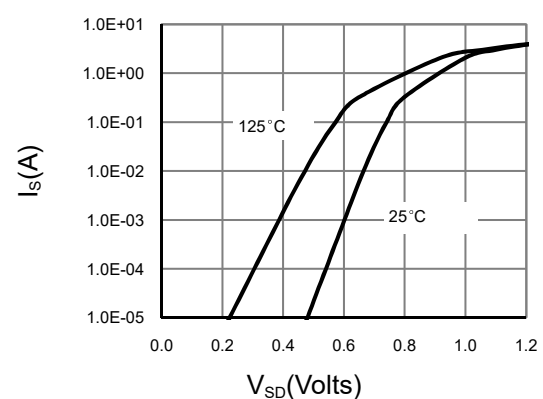


Figure 6: Body-Diode Characteristics(Note E)



7.2 Typical Characteristics

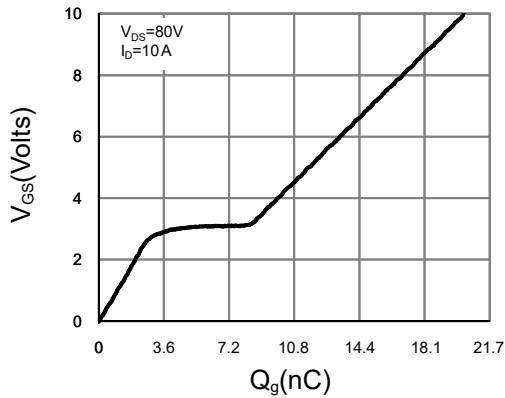


Figure 7: Gate-Charge Characteristics

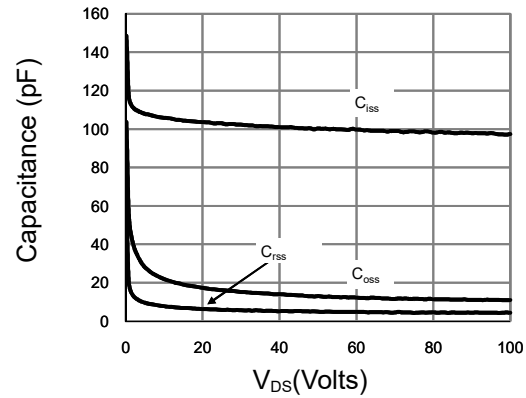


Figure 8: Capacitance Characteristics

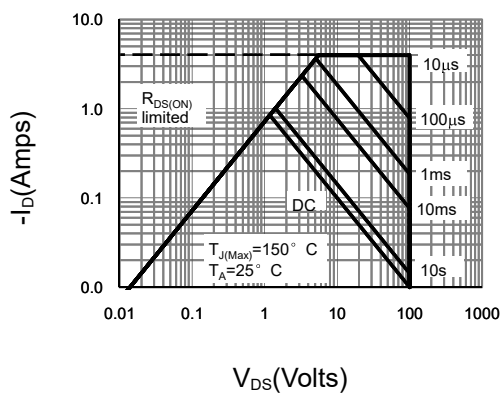


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

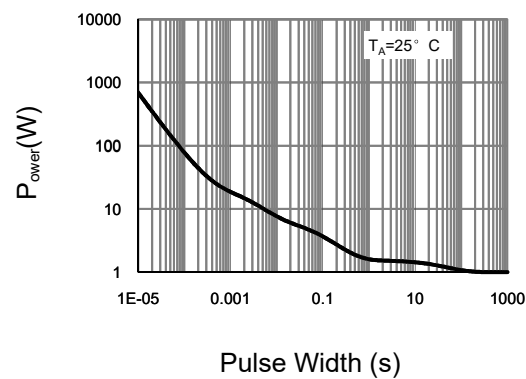


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note F)

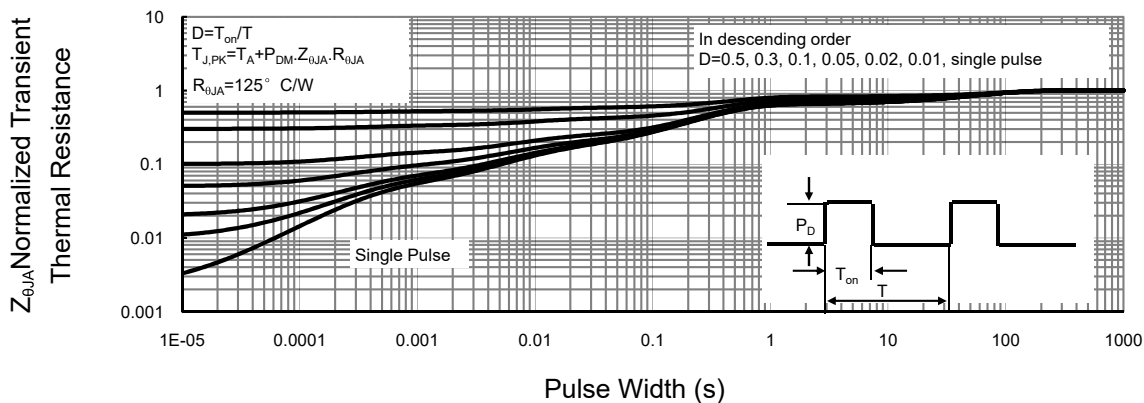


Figure 11: Normalized Maximum Transient Thermal Impedance (Note F)



8.1 Typical Characteristics

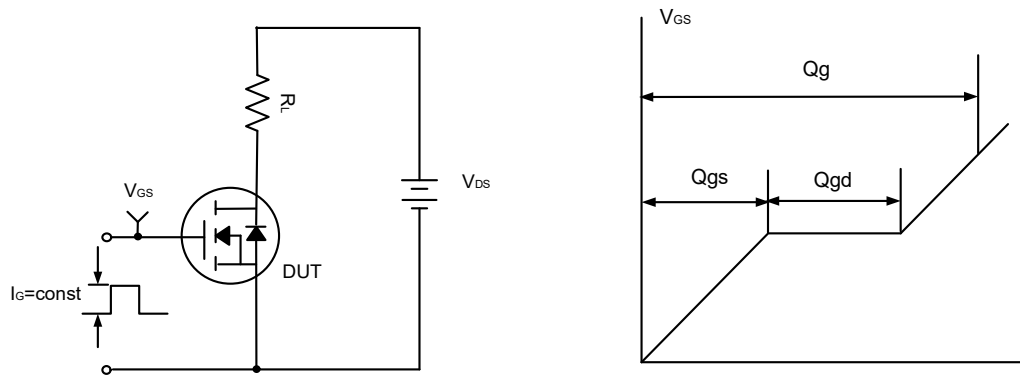


Figure1:Gate Charge Test Circuit & Waveform

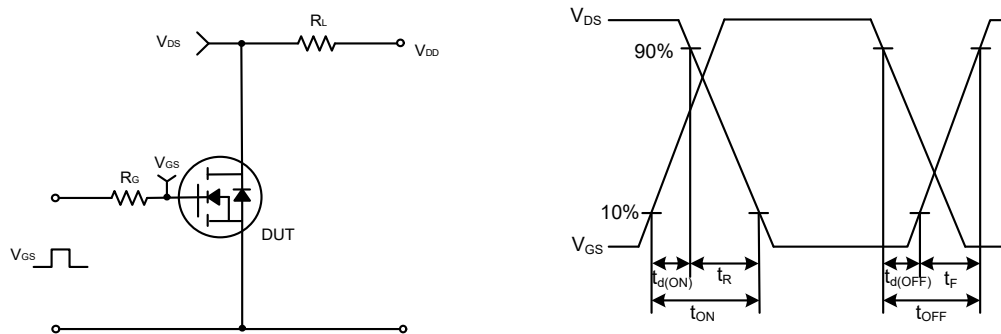


Figure 2: Resistive Switching Test Circuit & Waveforms

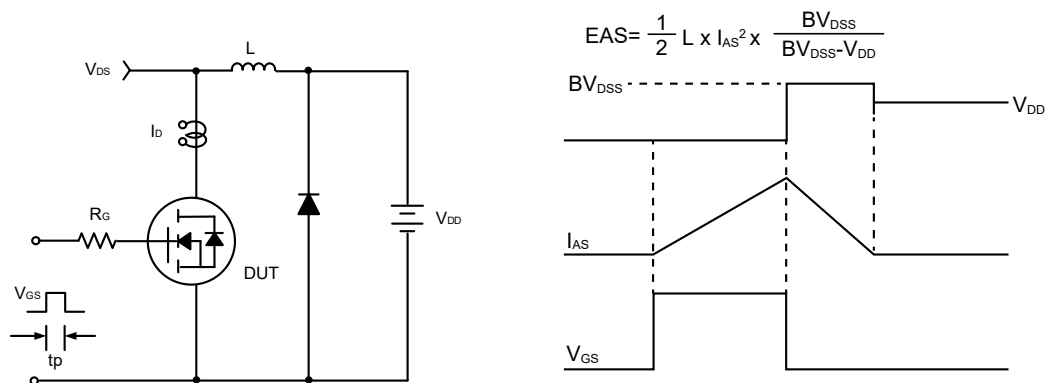


Figure 3:Unclamped inductive Switching Test Circuit & Waveforms



8.2 Typical Characteristics

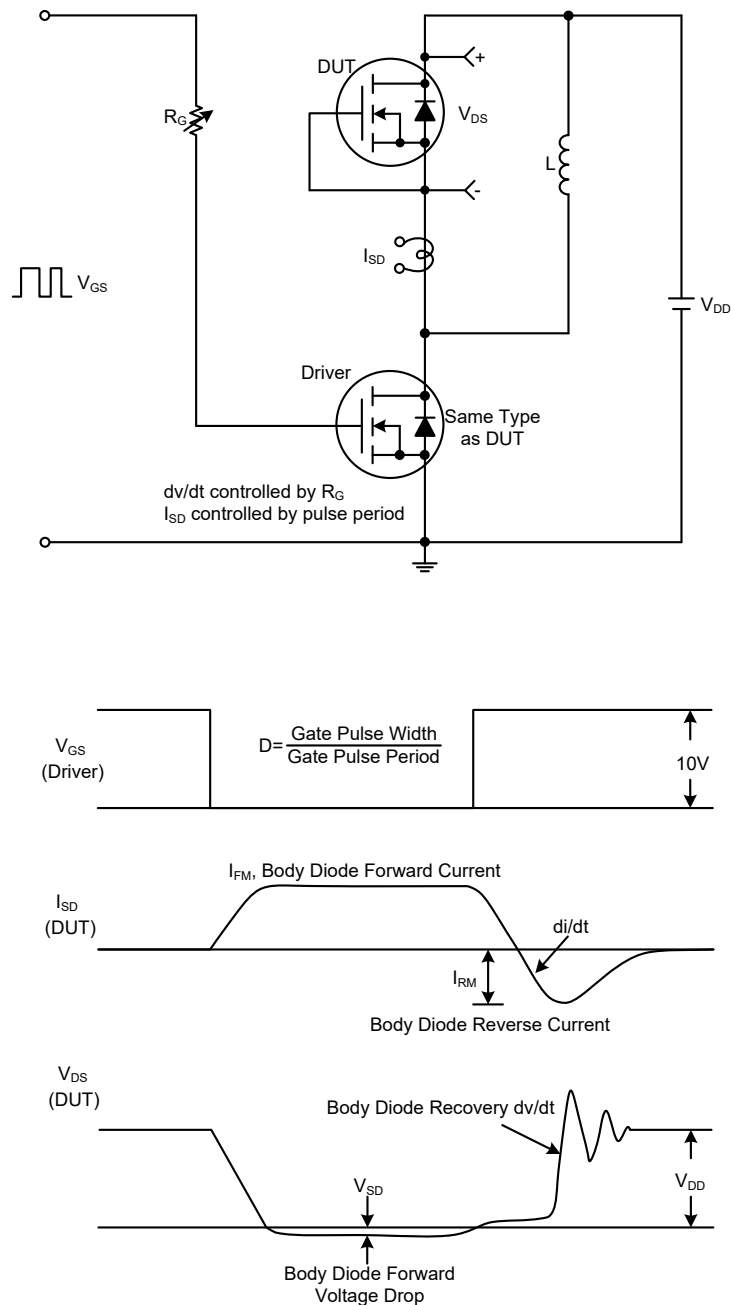
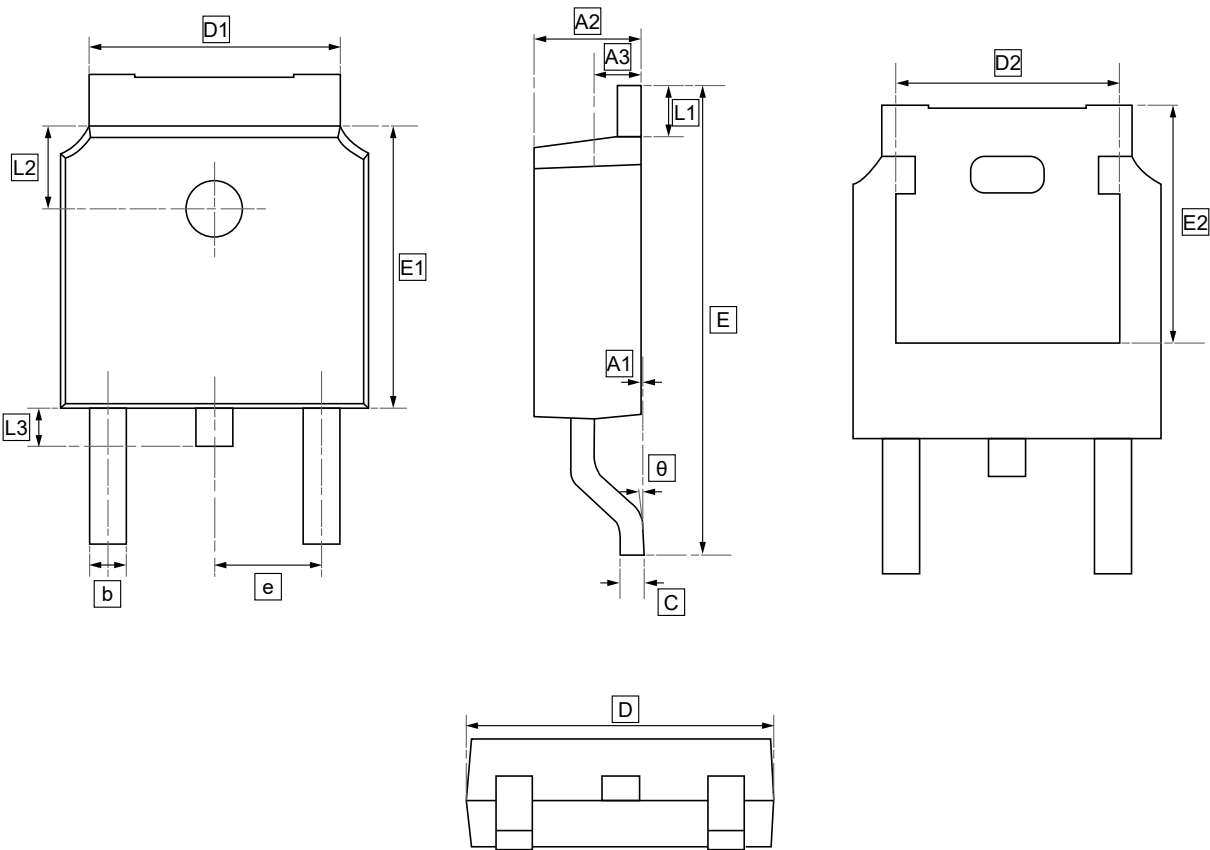


Figure 4: Peak Diode Recovery dv/dt Test Circuit and Waveforms



9.TO-252 Package Outline Dimensions

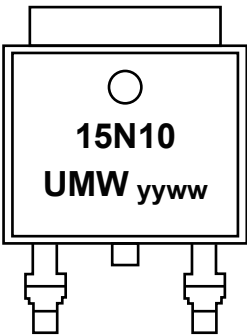


DIMENSIONS (mm are the original dimensions)

Symbol	A1	A2	A3	b	c	D	D1	D2	E	E1	E2	e	L1	L2	L3	θ
Min	0.00	2.18	0.90	0.65	0.46	6.35	4.95	4.32	9.40	5.97	5.21	2.286 BSC	0.89	1.70	0.60	0.00
Max	0.13	2.39	1.10	0.85	0.61	6.73	5.46	4.90	10.41	6.22	5.38		1.27	1.90	1.00	8.00



10.Ordering Information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW 15N10	TO-252	2500	Tape and reel



11.Disclaimer

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