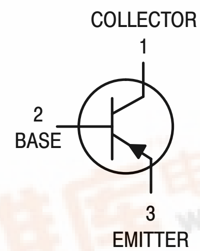
BC556B, BC557, A, B, C, BC558B, C

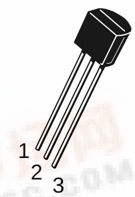
Amplifier Transistors

PNP Silicon

ON Semiconductor™

http://onsemi.com





CASE 29
TO–92
STYLE 17

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage BC556 / BC557 / BC558	V_{CEO}	–65 / –45 / –30	Vdc
Collector-Base Voltage BC556 / BC557 / BC558	V_{CBO}	–80 / –50 / –30	Vdc
Emitter-Base Voltage	V_{EBO}	–5.0	Vdc
Collector Current – Continuous	I_C	–100	mAdc
– Peak	I_{CM}	–200	
Base Current – Peak	I_{BM}	–200	mAdc
Total Device Dissipation @ T_A = 25°C	P_D	625	mW
Derate above 25°C		5.0	mW/°C
Total Device Dissipation @ T_C = 25°C	P_D	1.5	Watts
Derate above 25°C		12	mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	–55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	83.3	°C/W

ORDERING INFORMATION

Device	Package	Shipping
BC556B	TO–92	5000 Units/Box
BC556BRL1	TO–92	2000/Tape & Reel
BC556BZL1	TO–92	2000/Ammo Pack
BC557	TO–92	5000 Units/Box
BC557ZL1	TO–92	2000/Ammo Pack
BC557A	TO–92	5000 Units/Box
BC557AZL1	TO–92	2000/Ammo Pack
BC557B	TO–92	5000 Units/Box
BC557BRL1	TO–92	2000/Tape & Reel
BC557BZL1	TO–92	2000/Ammo Pack
BC557C	TO–92	5000 Units/Box
BC557CZL1	TO–92	2000/Ammo Pack
BC558B	TO–92	5000 Units/Box
BC558BRL	TO–92	2000/Tape & Reel
BC558BRL1	TO–92	2000/Tape & Reel
BC558BZL1	TO–92	2000/Ammo Pack
BC558C	TO–92	5000 Units/Box
BC558CRL1	TO–92	2000/Tape & Reel
BC558ZL1	TO–92	2000/Ammo Pack
BC558CZL1	TO–92	2000/Ammo Pack

Publication Order Number:

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Collector–Emitter Breakdown Voltage		$V_{(BR)CEO}$				V
(I_C = –2.0 mAdc, I_B = 0)	BC556		–65	–	–	
	BC557		–45	–	–	
	BC558		–30	–	–	
Collector–Base Breakdown Voltage		$V_{(BR)CBO}$				V
(I_C = –100 µAdc)	BC556		–80	–	–	
	BC557		–50	–	–	
	BC558		–30	–	–	
Emitter–Base Breakdown Voltage		$V_{(BR)EBO}$				V
(I_E = –100 µAdc, I_C = 0)	BC556		–5.0	–	–	
	BC557		–5.0	–	–	
	BC558		–5.0	–	–	
Collector–Emitter Leakage Current		I_{CES}				
(V_{CES} = –40 V)	BC556		–	–2.0	–100	nA
(V_{CES} = –20 V)	BC557		–	–2.0	–100	
	BC558		–	–2.0	–100	
(V_{CES} = –20 V, T_A = 125°C)	BC556		–	–	–4.0	µA
	BC557		–	–	–4.0	
	BC558		–	–	–4.0	

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristic		Symbol	Min	Typ	Max	Unit
ON CHARACTERISTICS						
DC Current Gain		h_{FE}				–
(I_C = –10 µAdc, V_{CE} = –5.0 V)	A Series Device		–	90	–	
	B Series Devices		–	150	–	
	C Series Devices		–	270	–	
(I_C = –2.0 mAdc, V_{CE} = –5.0 V)	BC557		120	–	800	
	A Series Device		120	170	220	
	B Series Devices		180	290	460	
	C Series Devices		420	500	800	
(I_C = –100 mAdc, V_{CE} = –5.0 V)	A Series Device		–	120	–	
	B Series Devices		–	180	–	
	C Series Devices		–	300	–	
Collector–Emitter Saturation Voltage		$V_{CE(sat)}$				V
(I_C = –10 mAdc, I_B = –0.5 mAdc)			–	–0.075	–0.3	
(I_C = –10 mAdc, I_B = see Note 1)			–	–0.3	–0.6	
(I_C = –100 mAdc, I_B = –5.0 mAdc)			–	–0.25	–0.65	
Base–Emitter Saturation Voltage		$V_{BE(sat)}$				V
(I_C = –10 mAdc, I_B = –0.5 mAdc)			–	–0.7	–	
(I_C = –100 mAdc, I_B = –5.0 mAdc)			–	–1.0	–	
Base–Emitter On Voltage		$V_{BE(on)}$				V
(I_C = –2.0 mAdc, V_{CE} = –5.0 Vdc)			–0.55	–0.62	–0.7	
(I_C = –10 mAdc, V_{CE} = –5.0 Vdc)			–	–0.7	–0.82	
SMALL–SIGNAL CHARACTERISTICS						
Current–Gain – Bandwidth Product		f_T				MHz
(I_C = –10 mA, V_{CE} = –5.0 V, f = 100 MHz)	BC556		–	280	–	
	BC557		–	320	–	
	BC558		–	360	–	
Output Capacitance (V_{CB} = –10 V, I_C = 0, f = 1.0 MHz)		C_{ob}	–	3.0	6.0	pF
Noise Figure		NF				dB
(I_C = –0.2 mAdc, V_{CE} = –5.0 V,	BC556		–	2.0	10	
R_S = 2.0 kΩ, f = 1.0 kHz, Δf = 200 Hz)	BC557		–	2.0	10	
	BC558		–	2.0	10	
Small–Signal Current Gain		h_{fe}				–
(I_C = –2.0 mAdc, V_{CE} = 5.0 V, f = 1.0 kHz)	BC557		125	–	900	
	A Series Device		125	–	260	
	B Series Devices		240	–	500	
	C Series Devices		450	–	900	

Note 1: I_C = –10 mAdc on the constant base current characteristics, which yields the point I_C = –11 mAdc, V_{CE} = –1.0 V.

BC557/BC558

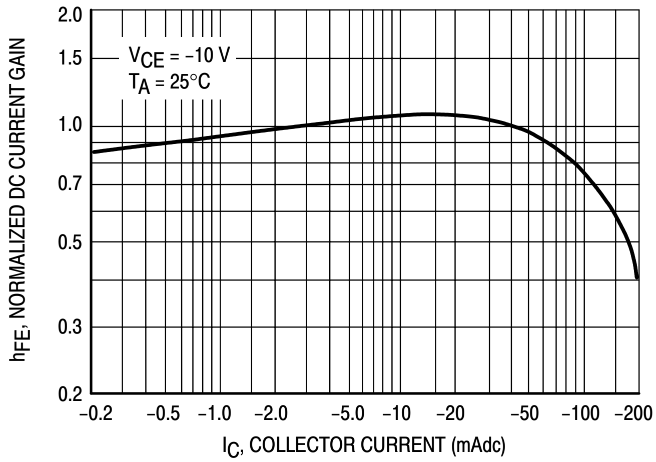


Figure 1. Normalized DC Current Gain

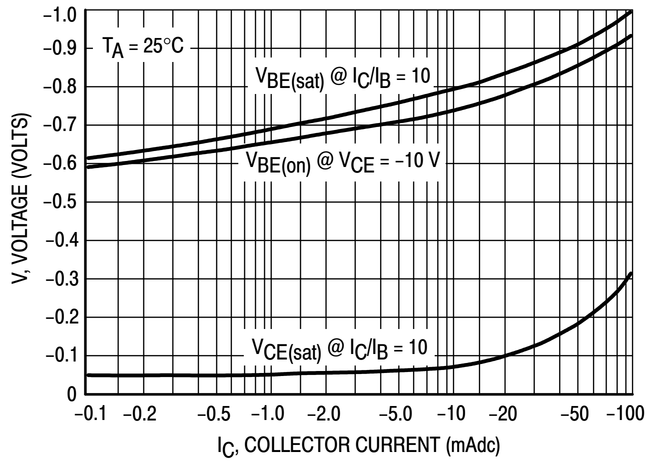


Figure 2. "Saturation" and "On" Voltages

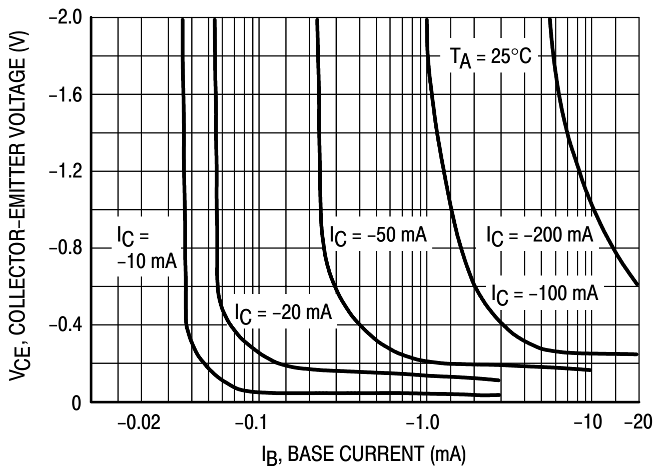


Figure 3. Collector Saturation Region

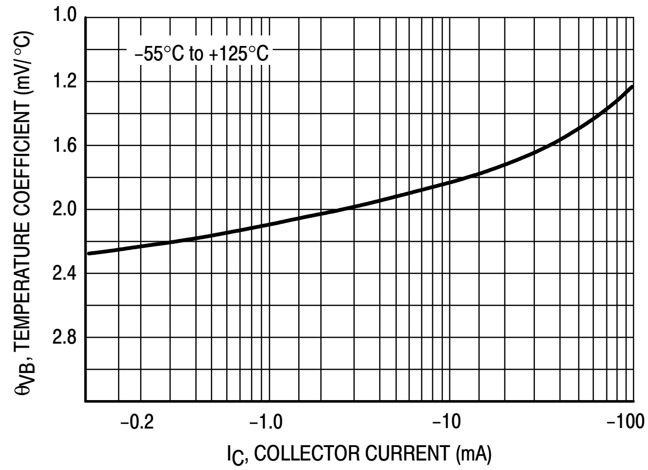


Figure 4. Base−Emitter Temperature Coefficient

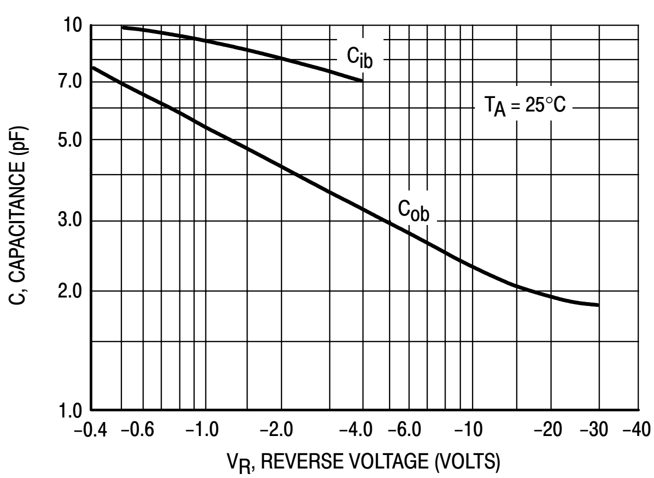


Figure 5. Capacitances

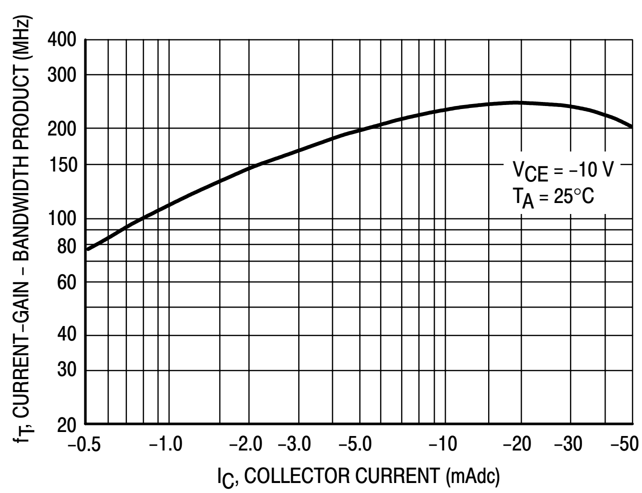


Figure 6. Current−Gain − Bandwidth Product

BC556

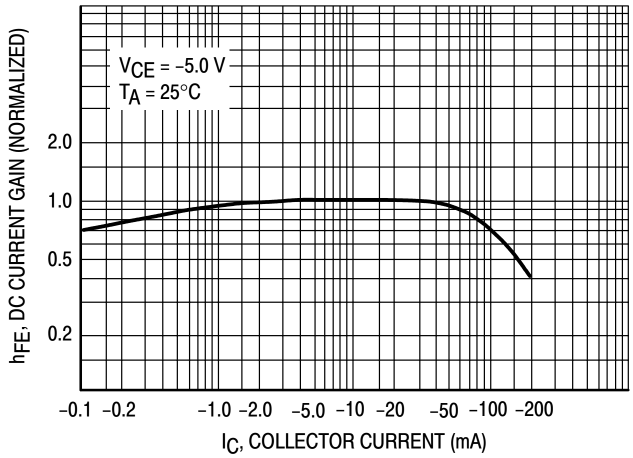


Figure 7. DC Current Gain

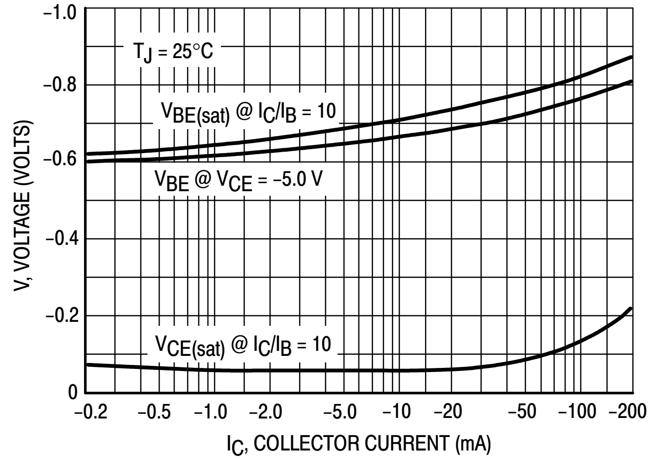


Figure 8. "On" Voltage

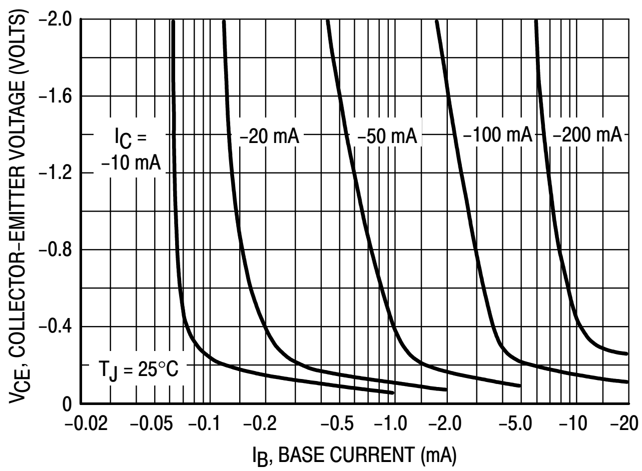


Figure 9. Collector Saturation Region

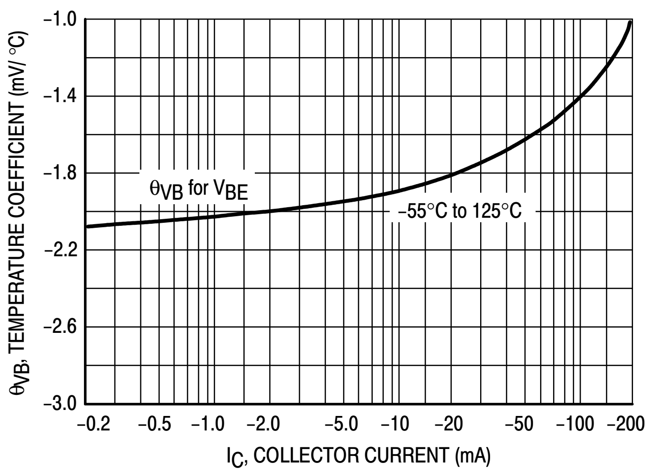


Figure 10. Base–Emitter Temperature Coefficient

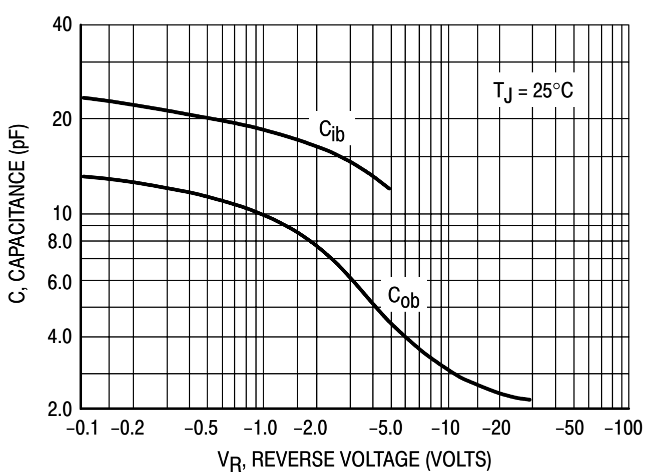


Figure 11. Capacitance

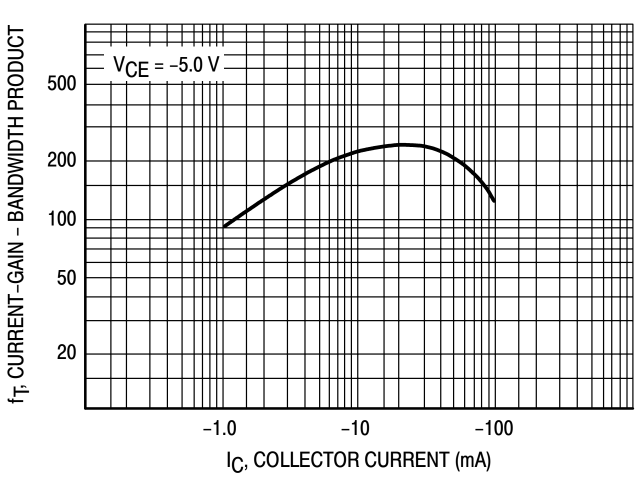


Figure 12. Current–Gain – Bandwidth Product

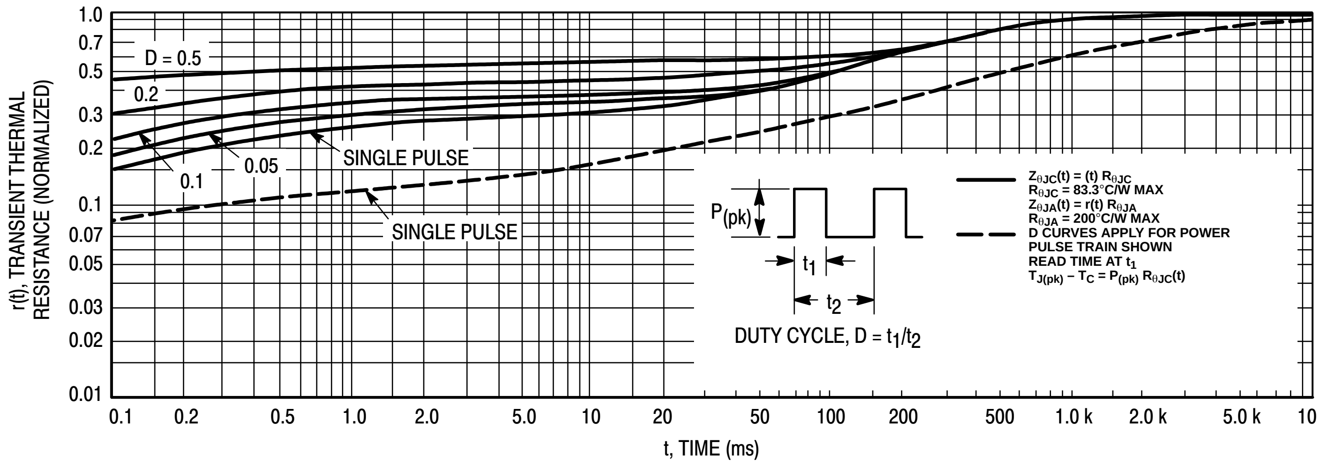


Figure 13. Thermal Response

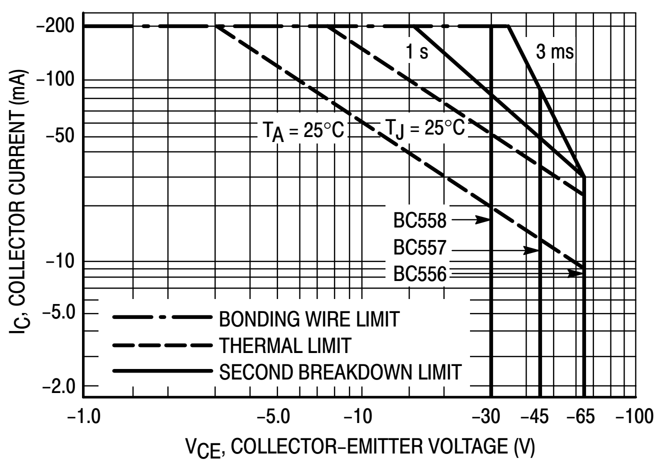


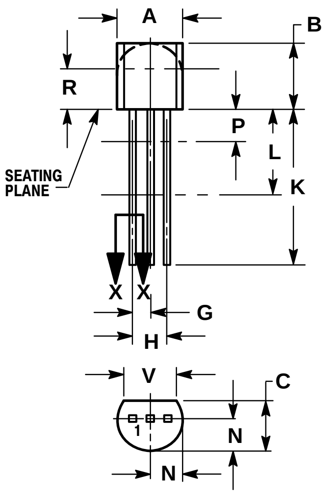
Figure 14. Active Region – Safe Operating Area

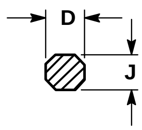
The safe operating area curves indicate I_C–V_{CE} limits of the transistor that must be observed for reliable operation. Collector load lines for specific circuits must fall below the limits indicated by the applicable curve.

The data of Figure 14 is based upon $T_{J(pk)}$ = 150°C; T_C or T_A is variable depending upon conditions. Pulse curves are valid for duty cycles to 10% provided $T_{J(pk)} \leq$ 150°C. $T_{J(pk)}$ may be calculated from the data in Figure 13. At high case or ambient temperatures, thermal limitations will reduce the power than can be handled to values less than the limitations imposed by second breakdown.

PACKAGE DIMENSIONS

TO–92
(TO–226)
CASE 29–11
ISSUE AL





SECTION X–X

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. CONTOUR OF PACKAGE BEYOND DIMENSION R IS UNCONTROLLED.
4. LEAD DIMENSION IS UNCONTROLLED IN P AND BEYOND DIMENSION K MINIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.175	0.205	4.45	5.20
B	0.170	0.210	4.32	5.33
C	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
H	0.095	0.105	2.42	2.66
J	0.015	0.020	0.39	0.50
K	0.500	---	12.70	---
L	0.250	---	6.35	---
N	0.080	0.105	2.04	2.66
P	---	0.100	---	2.54
R	0.115	---	2.93	---
V	0.135	---	3.43	---

STYLE 17:
PIN 1. COLLECTOR
2. BASE
3. EMITTER

PUBLICATION ORDERING INFORMATION

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