JMSL0603PE

Features

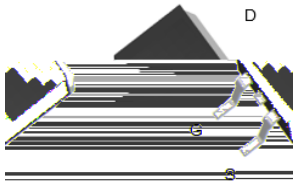
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- 100% UIS Tested
- 100% Vds Tested
- Halogen-free; RoHS-compliant

Applications

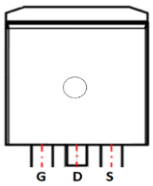
- Load Switch
- PWM Application
- Power Management

Product Summary

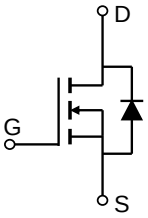
Parameters	Value	Unit
V_{DSS}	60	V
$V_{GS(th)_Typ}$	1.6	V
I_D(@V_{GS}=10V)	198	A
$R_{DS(ON)_Typ}$(@V_{GS}=10V)	2.2	mΩ
$R_{DS(ON)_Typ}$(@V_{GS}=4.5V)	2.8	mΩ



TO-263-3L



Pin Assignment



Schematic Diagram

Ordering Information

Device	Marking	MSL	Form	Package	Reel(pcs)	Per Carton (pcs)
JMSL0603PE-13	SL0603P	3	Tape&Reel	TO-263-3L	800	4000

Absolute Maximum Ratings (@ T_C = 25°C unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{DS}	Drain-to-Source Voltage		60	V
V_{GS}	Gate-to-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25°C	198.3	A
		T_C = 100°C	125.4	
I_{DM}	Pulsed Drain Current (1)		Refer to Fig.4	A
E_{AS}	Single Pulsed Avalanche Energy (2)		324	mJ
P_D	Power Dissipation	T_C = 25°C	188	W
		T_C = 100°C	75	
T_J, T_{STG}	Junction & Storage Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient(3)	41	°C/W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.67	

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Electrical Characteristics (T_J = 25°C unless otherwise specified)

Symbol		Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
$V_{(BR)DSS}$			60	-	-	V
I_{DSS}			-	-	1.0	μA
I_{GSS}			-	-	±100	nA
$V_{GS(th)}$			1.1	1.6	2.4	V
$R_{DS(ON)}$			-	2.2	2.8	mΩ
			-	2.8	3.7	mΩ
R_g	Gate Resistance	f = 1MHz	-	2.1	-	Ω
C_{iss}			-	3566	5349	pF
C_{oss}			-	1749	2624	pF
C_{rss}			-	103	207	pF
Q_g			-	62	-	nC
Q_{gs}			-	10	-	nC
Q_{gd}			-	14	-	nC
$t_{d(on)}$			-	11	-	ns
t_r		V_{GS} = 10V, V_{DD} = 30V	-	28	-	ns
$t_{d(off)}$		I_D= 20A, R_{GEN} = 3	-	54	-	ns
t_f			-	30	-	ns
I_S			-	-	198	A
I_{SM}			-	-	793	A
V_{SD}			-		1.2	V
trr			40	57	85	ns
Qrr	Body Diode Reverse Recovery Charge		-	69	-	nC

Notes: 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting T_J=25C, V_{DD}=30V, V_G=10V, R_G=25ohm, L=3mH, I_{AS}=14.7A, V_{DD}=0V during time in avalanche.

3. R □ is measured with the device mounted on a 1inch^2 pad of 2oz copper FR4 PCB.

4. Pulse Test: Pulse Width≤ ≤0.5%.

Typical Performance Characteristics

Figure 1: Power De-rating

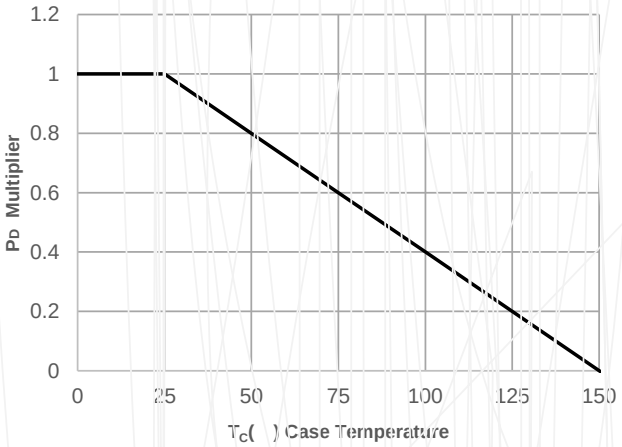
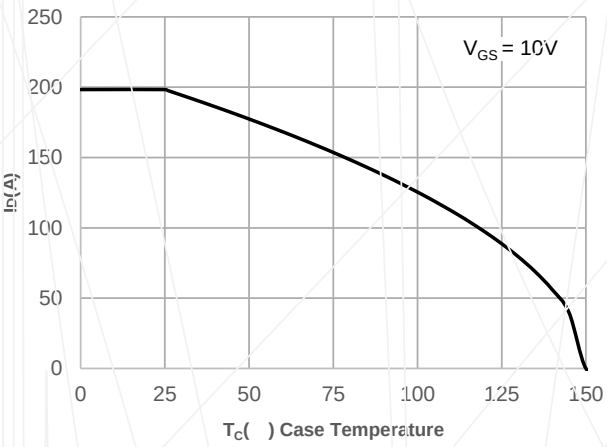
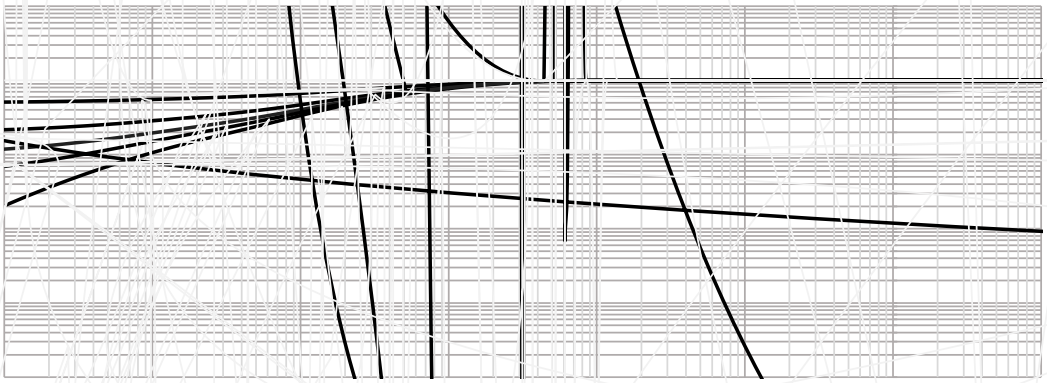


Figure 2: Current De-rating





Typical Performance Characteristics

Figure 5: Output Characteristics

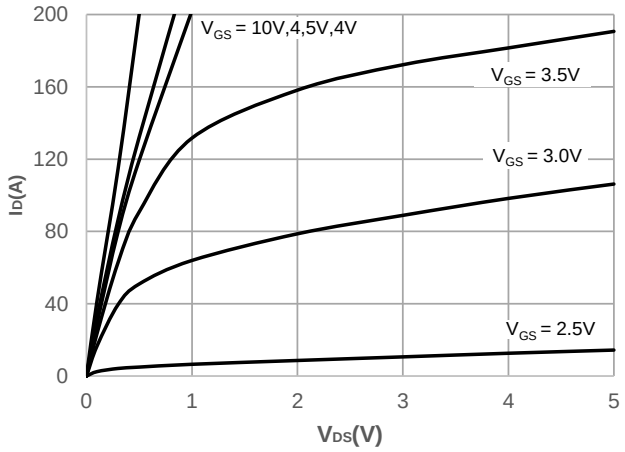


Figure 6: Typical Transfer Characteristics

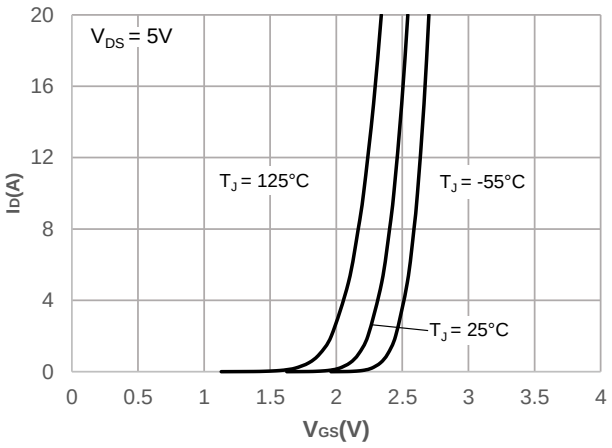


Figure 7: On-resistance vs. Drain Current

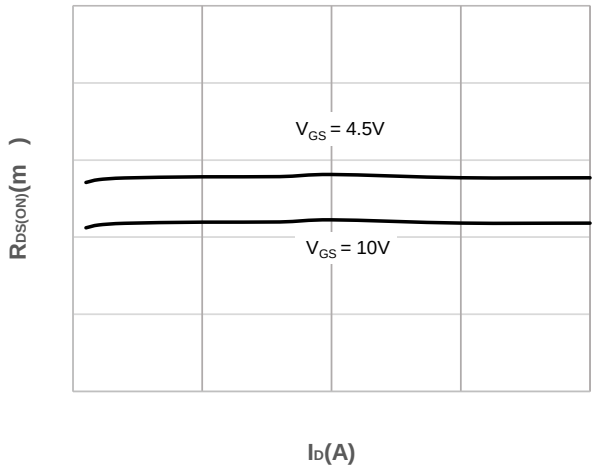


Figure 8: Body Diode Characteristics

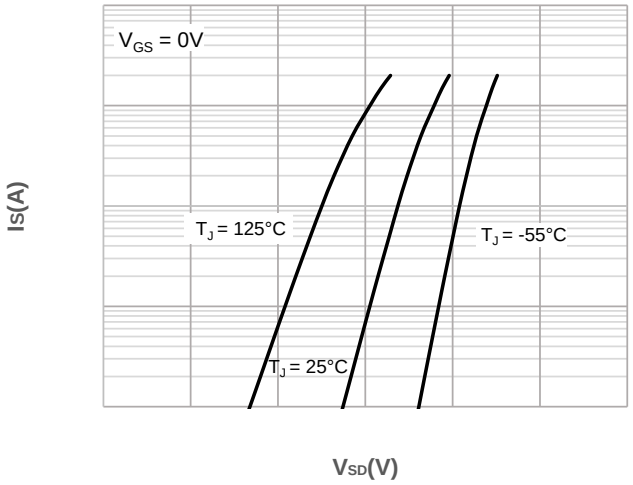


Figure 9: Gate Charge Characteristics

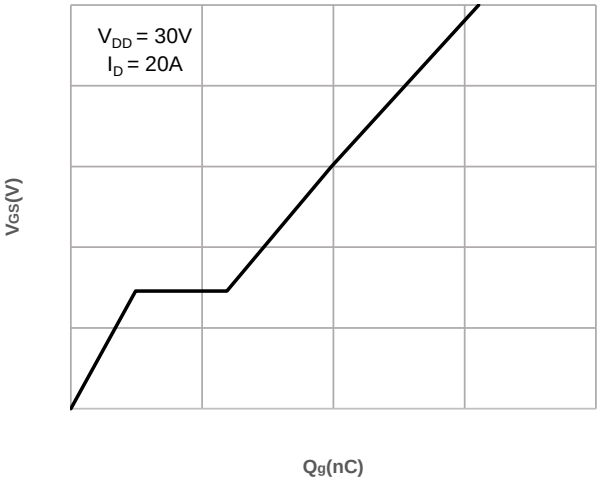
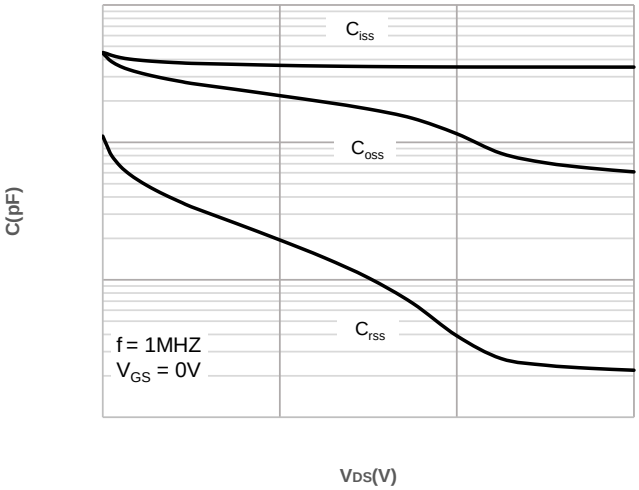


Figure 10: Capacitance Characteristics



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Typical Performance Characteristics

Figure 11: Normalized Breakdown voltage vs. Junction Temperature

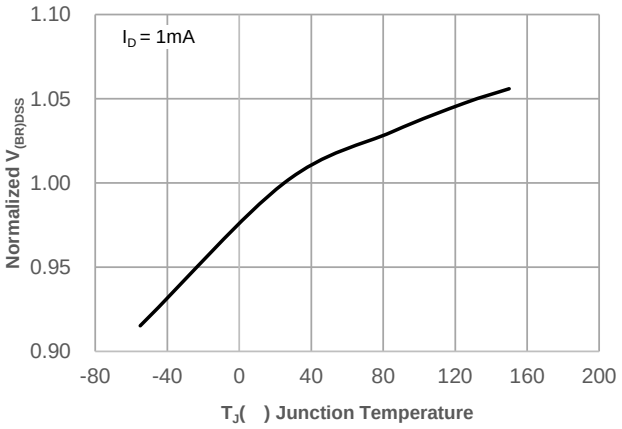


Figure 12: Normalized on Resistance vs. Junction Temperature

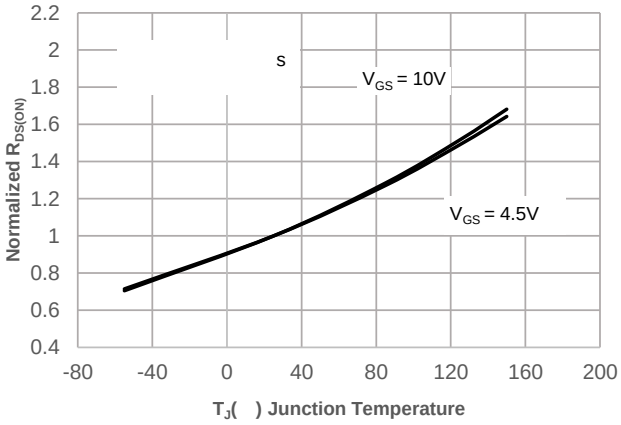


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

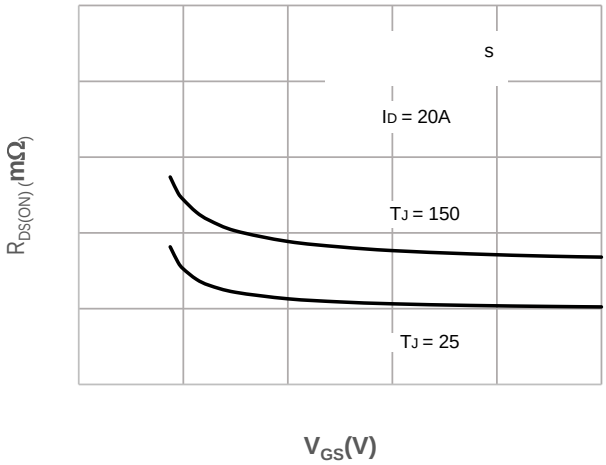
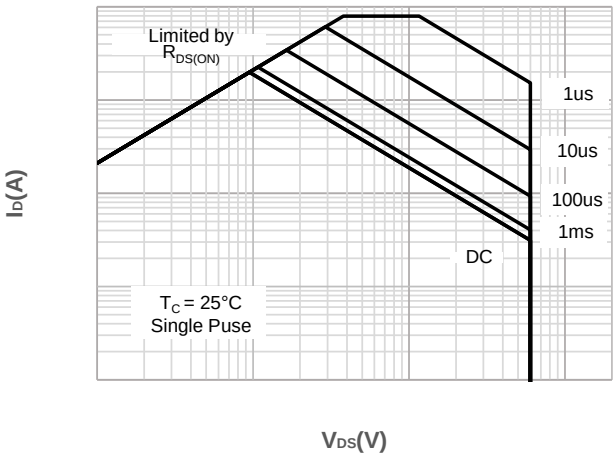


Figure 15: Maximum Safe Operating Area



Test Circuit

Figure 1: Gate Charge Test Circuit & Waveform

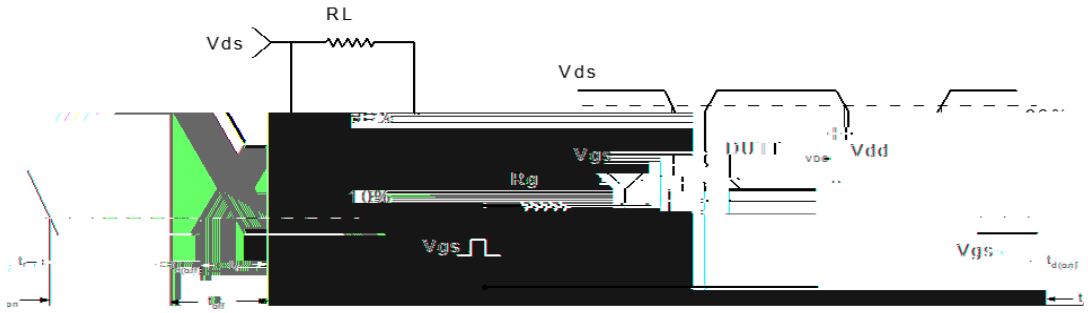


Figure 2: Resistive Switching Test Circuit & Waveform

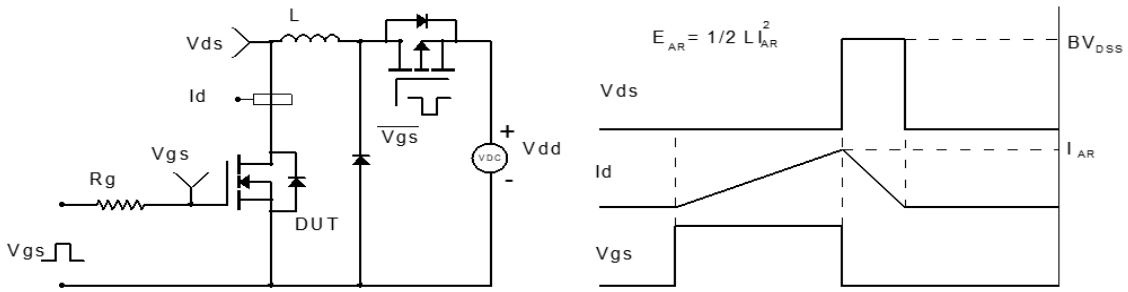


Figure 3: Unclamped Inductive Switching Test Circuit& Waveform

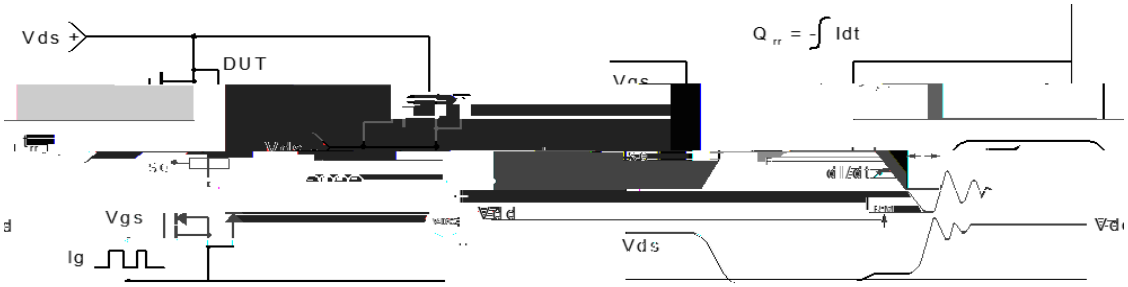


Figure 4: Diode Recovery Test Circuit & Waveform

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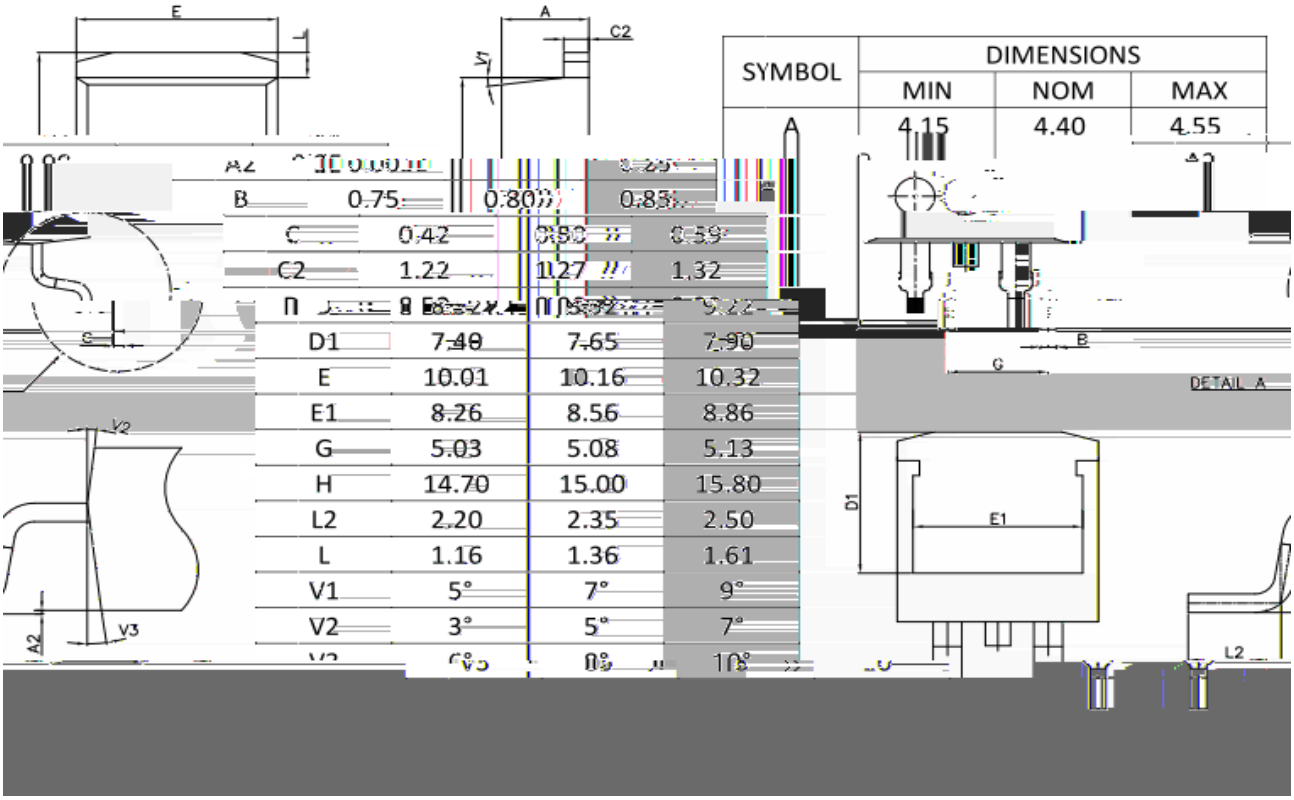
Package Mechanical Data(TO-25263-3L)

Package Outline



SYMBOL	DIMENSIONS		
	MIN	NOM	MAX
A	4.15	4.40	4.55
B	0.75	0.80	0.85
C	0.42	0.50	0.59
C2	1.22	1.27	1.32
D	8.50	9.00	9.22
D1	7.40	7.65	7.90
E	10.01	10.16	10.32
E1	8.26	8.56	8.86
G	5.03	5.08	5.13
H	14.70	15.00	15.80
L2	2.20	2.35	2.50
L	1.16	1.36	1.61
V1	5°	7°	9°
V2	3°	5°	7°
V3	0°		10°

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