

## Description

### JMT N-channel Enhancement Mode Power MosFET

#### Features

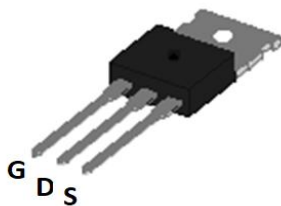
- 30V, 150A
- $R_{DS(ON)} < 3.3m\Omega @ V_{GS} = 10V$
- $R_{DS(ON)} < 6.2m\Omega @ V_{GS} = 4.5V$
- Advanced Trench Technology
- Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free

#### Applications

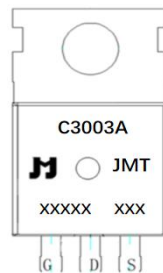
- Load Switch
- PWM Application
- Power Management



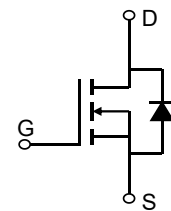
**100% UIS TESTED!**  
**100% ΔVds TESTED!**



TO-220C-3L Top View



Marking and Pin Assignment



Schematic Diagram

## Package Marking and Ordering Information

Device Marking	Device	Outline	Package	TUBE (PCS)	Inner Box (PCS)	Per Carton (pcs)
JMTC3003A	JMTC3003AN	TUBE	TO-220C-3L	50	1000	5000

## Absolute Maximum Ratings (@ $T_C = 25^\circ C$ unless otherwise specified)

Symbol	Parameter	Value	Units
$V_{DS}$	Drain-to-Source Voltage	30	V
$V_{GS}$	Gate-to-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	150
		$T_C = 100^\circ C$	95
$I_{DM}$	Pulsed Drain Current <sup>(1)</sup>	600	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>(2)</sup>	210	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	89
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient <sup>(3)</sup>	56	$^\circ C/W$
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.40	$^\circ C/W$
$T_J, T_{STG}$	Junction & Storage Temperature Range	-55 to 150	$^\circ C$



## Electrical Characteristics (T<sub>J</sub> = 25°C unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
<b>Off Characteristics</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	I <sub>D</sub> = 250μA, V <sub>GS</sub> = 0V	30	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 0V	-	-	1.0	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1.0	1.7	2.5	V
R <sub>DS(ON)</sub>	Static Drain-Source ON-Resistance <sup>(4)</sup>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 30A	-	2.5	3.3	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 20A	-	4.8	6.2	mΩ
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 15V, f = 1MHz	-	3650	-	pF
C <sub>oss</sub>	Output Capacitance		-	494	-	pF
C <sub>riss</sub>	Reverse Transfer Capacitance		-	366	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>GS</sub> = 0 to 10V V <sub>DD</sub> = 30V, I <sub>D</sub> = 15A	-	67	-	nC
Q <sub>gs</sub>	Gate Source Charge		-	11	-	nC
Q <sub>gd</sub>	Gate Drain("Miller") Charge		-	19	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-On DelayTime	V <sub>GS</sub> = 10V, V <sub>DD</sub> = 15V I <sub>D</sub> = 30A, R <sub>GEN</sub> = 3Ω	-	10	-	ns
t <sub>r</sub>	Turn-On Rise Time		-	19	-	ns
t <sub>d(off)</sub>	Turn-Off DelayTime		-	50	-	ns
t <sub>f</sub>	Turn-Off Fall Time		-	20	-	ns
<b>Drain-Source Diode Characteristics and Max Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	150	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	600	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> = 0V, I <sub>S</sub> = 30A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> = 20A, di/dt = 100A/μs	-	18	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	6	-	nC

- Notes:
1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
  2. E<sub>AS</sub> condition: Starting T<sub>J</sub> = 25°C, V<sub>DD</sub> = 15V, V<sub>G</sub> = 10V, R<sub>G</sub> = 25Ω, L = 0.5mH, I<sub>AS</sub> = 29A.
  3. R<sub>θJA</sub> is measured with the device mounted on a minimum recommended pad of 2oz copper FR4 PCB.
  4. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 0.5%.

## Typical Performance Characteristics

Figure 1: Output Characteristics

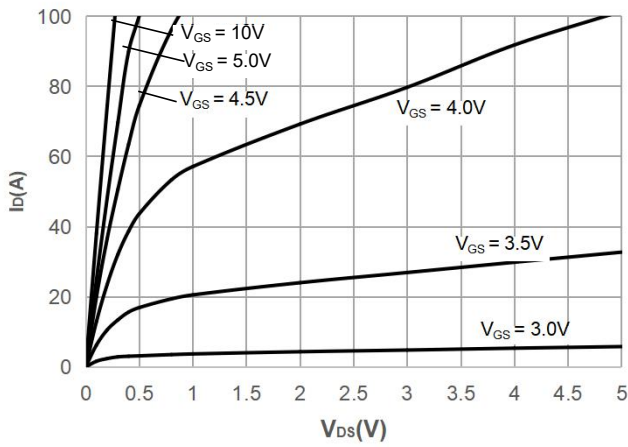


Figure 2: Typical Transfer Characteristics

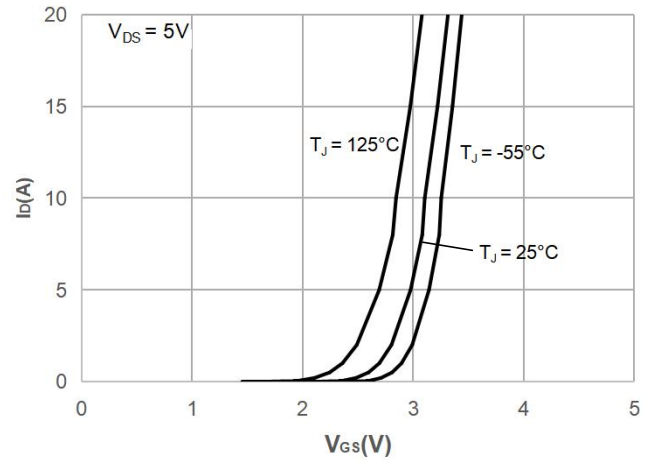


Figure 3: On-resistance vs. Drain Current

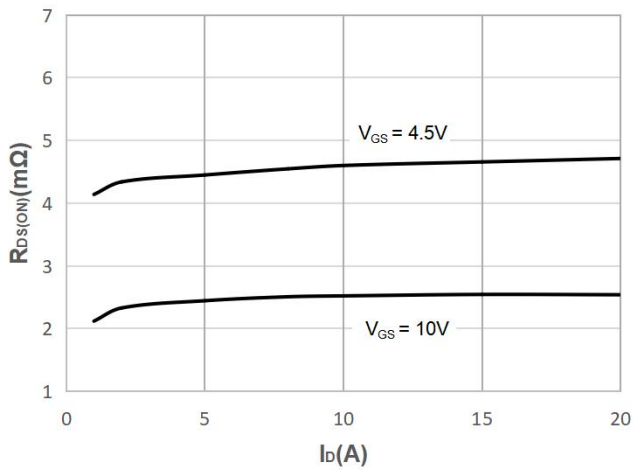


Figure 4: Body Diode Characteristics

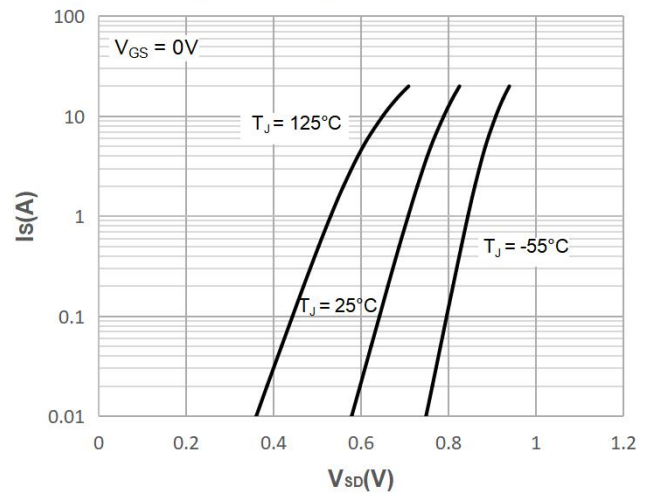


Figure 5: Gate Charge Characteristics

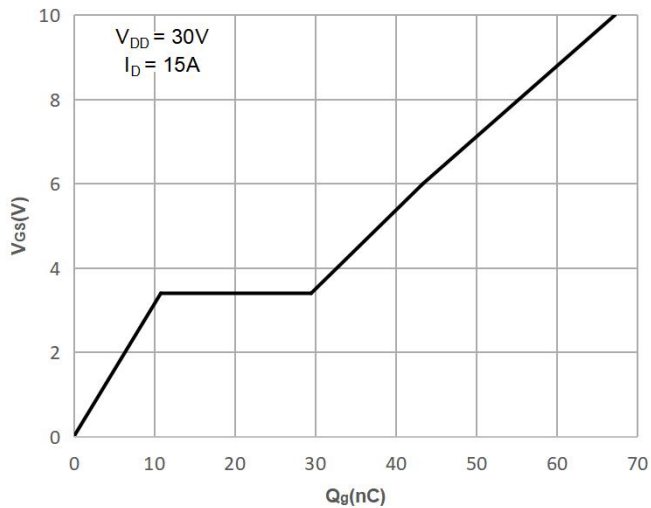
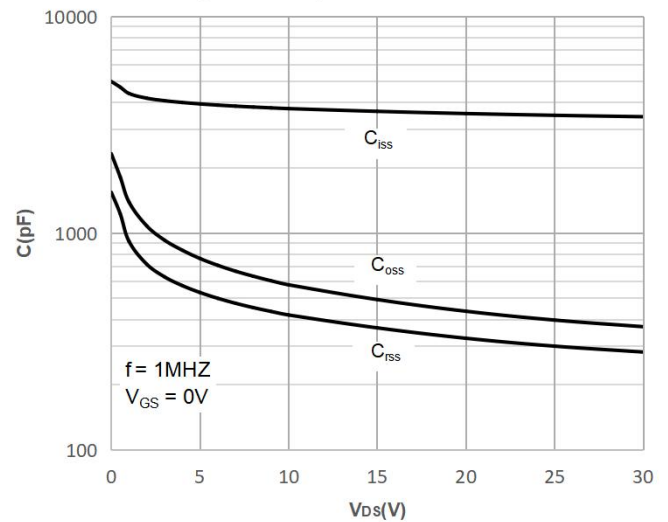


Figure 6: Capacitance Characteristics



## Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

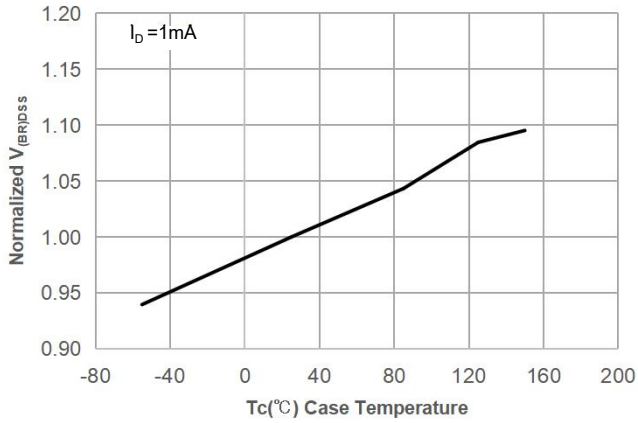


Figure 8: Normalized on Resistance vs. Junction Temperature

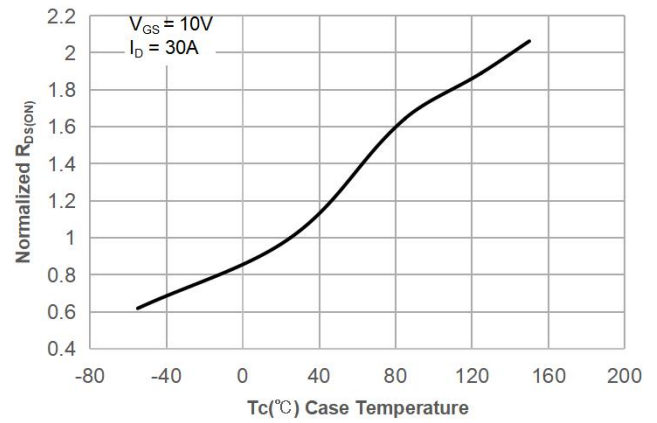


Figure 9: Maximum Safe Operating Area

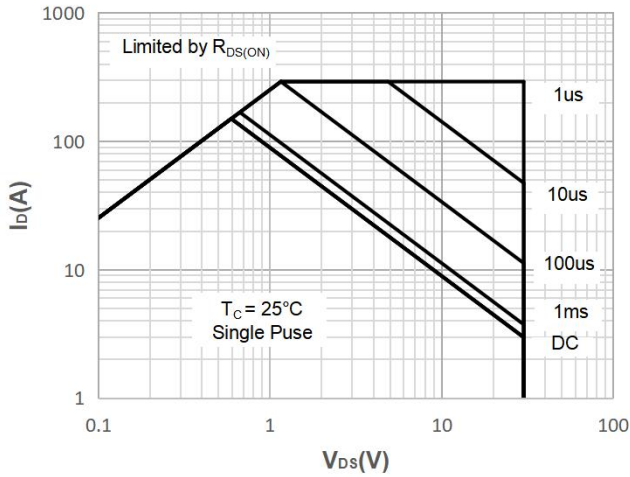


Figure 10: Maximum Continuous Driain Current vs. Case Temperature

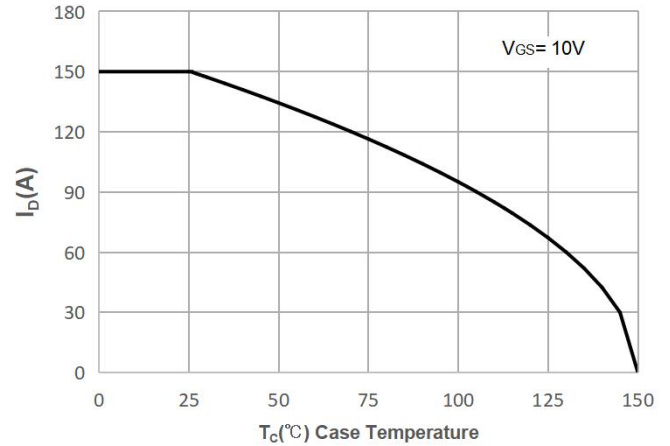


Figure 11: Normalized Maximum Transient Thermal Impedance

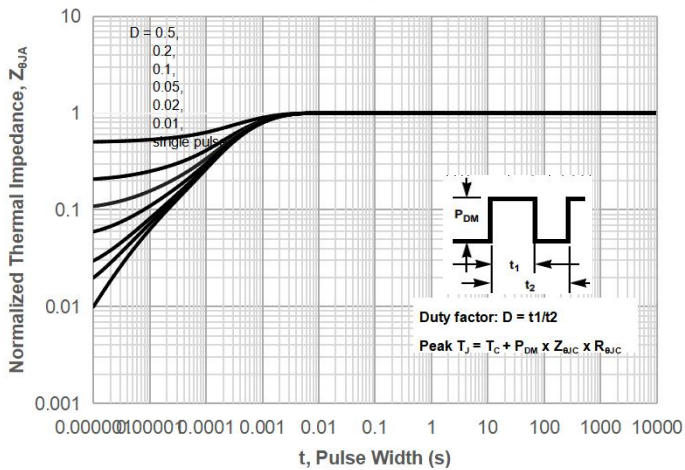
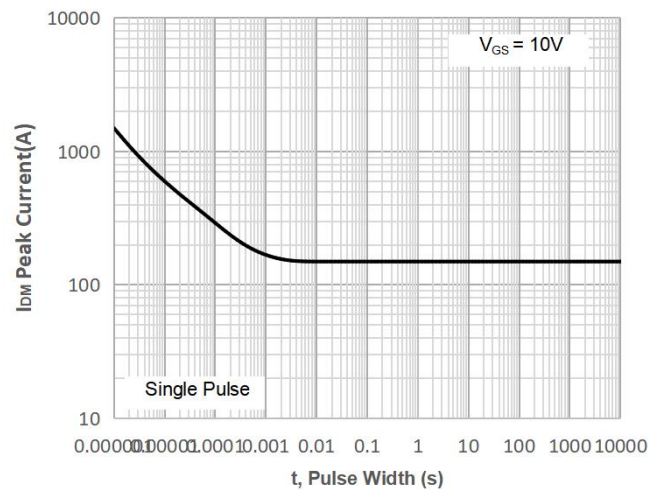
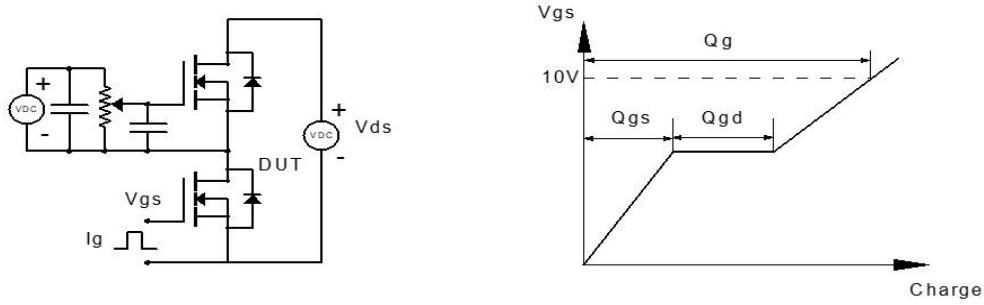


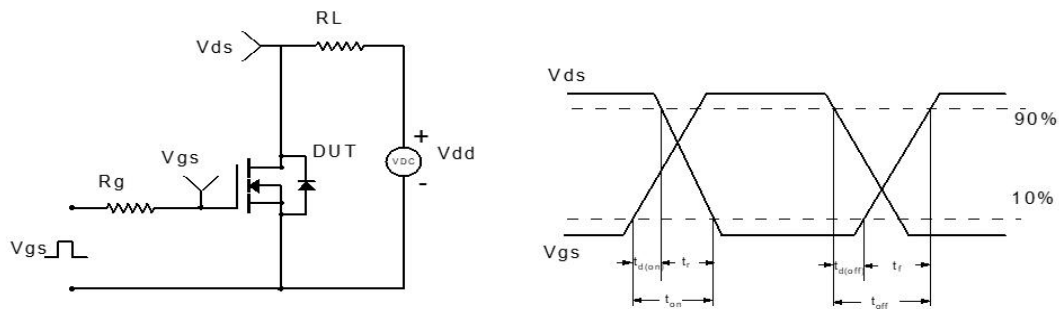
Figure 12: Peak Current Capacity



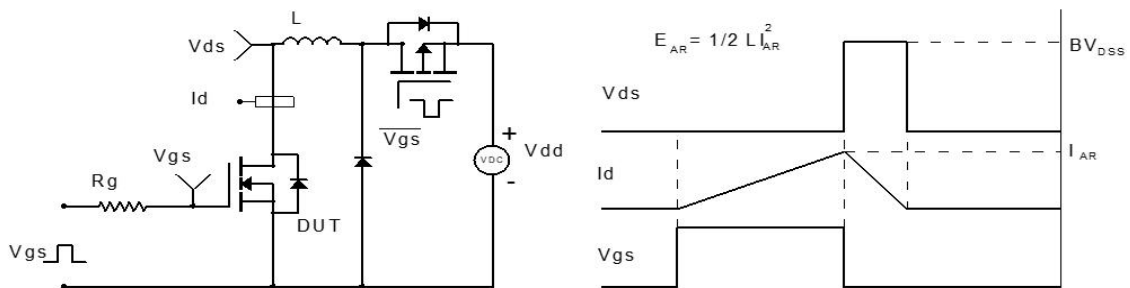
## Test Circuit



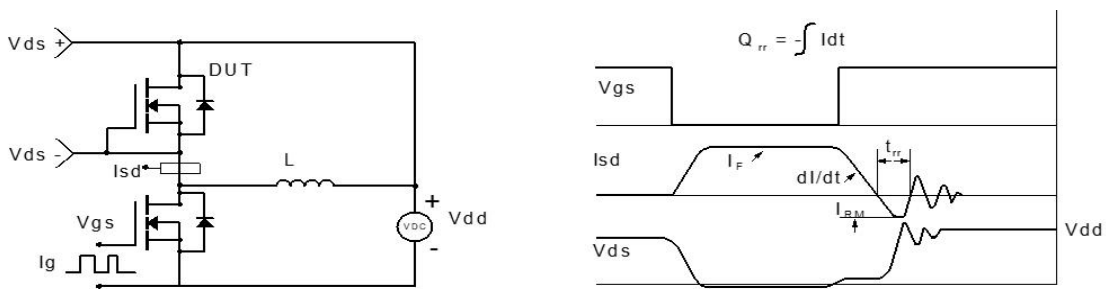
**Figure 1: Gate Charge Test Circuit & Waveform**



**Figure 2: Resistive Switching Test Circuit & Waveform**

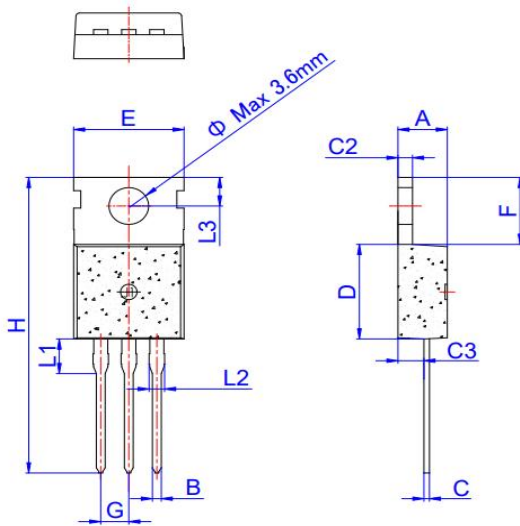


**Figure 3: Unclamped Inductive Switching Test Circuit & Waveform**




**Figure 4: Diode Recovery Test Circuit & Waveform**

## Package Mechanical Data(TO-220C-3L)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
B	0.70		0.90	0.028		0.035
C	0.45		0.60	0.018		0.024
C2	1.23		1.32	0.048		0.052
C3	2.20		2.60	0.087		0.102
D	8.90		9.90	0.350		0.390
E	9.90		10.3	0.390		0.406
F	6.30		6.90	0.248		0.272
G		2.54			0.1	
H	28.0		29.8	1.102		1.173
L1		3.39			0.133	
L2	1.14		1.70	0.045		0.067
L3	2.65		2.95	0.104		0.116
Φ		3.6			0.142	

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