General Description

The WSF4095 is the highest performance trench N-Channel MOSFET with extreme high cell density,which provide excellent RDSON and gate chargefor most of the synchronous buck converterapplications.

The WSF4095 meet the RoHS and GreenProduct requirement 100% EAS guaranteed withfull function reliability approved.

Features

- Advanced high cell density Trench technology
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- 100% EAS Guaranteed
- Green Device Available

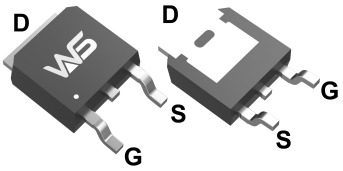
Product Summery

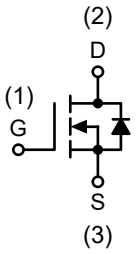
BV_{DSS}	R_{DSON}	I_D
40V	4mΩ	95A

Applications

- SMPS Synchronous Rectification.
- Load Switch.
- DC-DC Conversion.

TO-252-2L Pin Configuration





Absolute Maximum Ratings (T_A = 25ÁC,Unless Otherwise Noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	40	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	95	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1]	50	A
I_D@T_A=25℃	Continuous Drain Current, V_{GS} @ 10V[1]	18	A
I_D@T_A=70℃	Continuous Drain Current, V_{GS} @ 10V[1]	14	A
I_{DM}	Pulsed Drain Current[2],T_C=25°C	224	A
EAS	Avalanche Energy, Single pulse,L=0.1mH	51	mJ
I_{AS}	Avalanche Current, Single pulse,L=0.1mH	32	A
P_D@T_C=25℃	Total Power Dissipation[4]	54	W
P_D@T_C=100℃	Total Power Dissipation[4]	22	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	50	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	2.3	℃/W

Electrical Characteristics (T_J=25℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	40	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V, I_{DS}=20A	---	4	4.8	mΩ
		V_{GS}=4.5V, I_{DS}=15A	---	5.2	6.8	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	1.3	1.7	2.5	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=32V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=32V , V_{GS}=0V , T_J=85℃	---	---	30	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
gfs	orward Transconductance	V_{DS}=5V , I_D=20A	---	31	---	S
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	1	2	Ω
Q_g	Total Gate Charge (10V)	V_{DS}=20V , V_{GS}=10V , I_D=20A	---	11.5	---	nC
Q_{gs}	Gate-Source Charge		---	5.2	---	
Q_{gd}	Gate-Drain Charge		---	2.6	---	
$T_{d(on)}$	Turn-On Delay Time	V_{DD}=20V, R_L=20Ω, I_{DS}=1A, V_{GEN}=10V, R_G=6Ω	---	7.7	14	ns
T_r	Rise Time		---	14.3	26	
$T_{d(off)}$	Turn-Off Delay Time		---	26.6	48	
T_f	Fall Time		---	32.6	59	
C_{iss}	Input Capacitance	V_{DS}=20V , V_{GS}=0V , f=1MHz	---	1645	2139	pF
C_{oss}	Output Capacitance		---	385	---	
C_{rss}	Reverse Transfer Capacitance		---	55	---	

Diode Characteristics

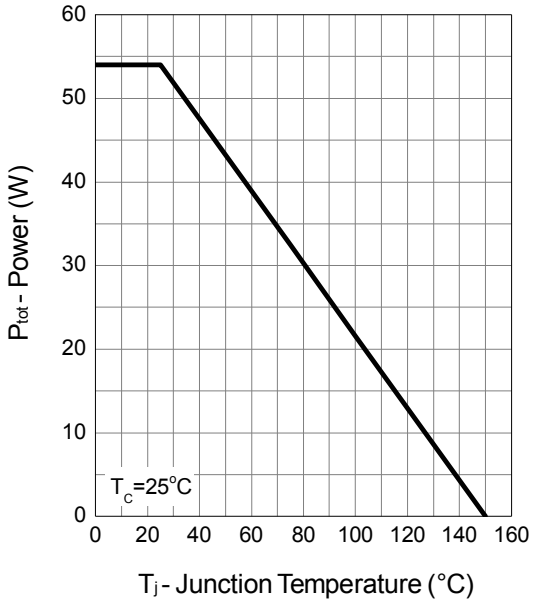
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,6]	V_G=V_D=0V , Force Current	---	---	25	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=20A , T_J=25℃	---	0.75	1.1	V
t_{rr}	Reverse Recovery Time	IF=20A,dI/dt=100A/μs,T_J=25℃	---	28	---	nS
Q_{rr}	Reverse Recovery Charge		---	20	---	nC

Note :

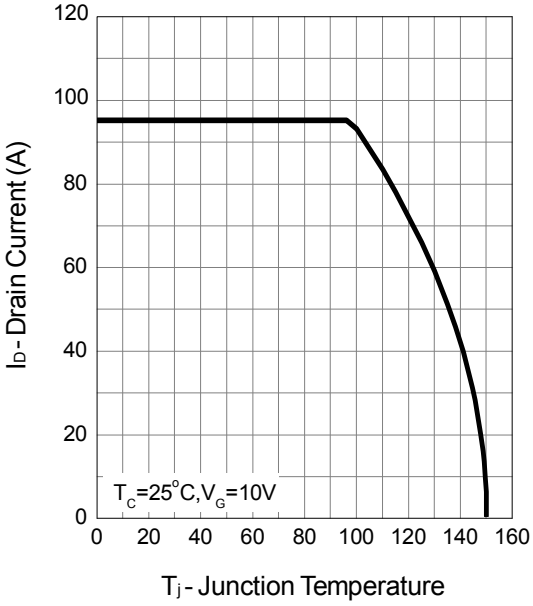
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper,t<10sec.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The EAS data shows Max. rating . The test condition is V_{DS}=20V,V_{GS}=10V,L=0.1mH,I_{AS}=32A
4.The power dissipation is limited by 150℃ junction temperature
5.The Min. value is 100% EAS tested guarantee.
6.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

Typical Characteristics

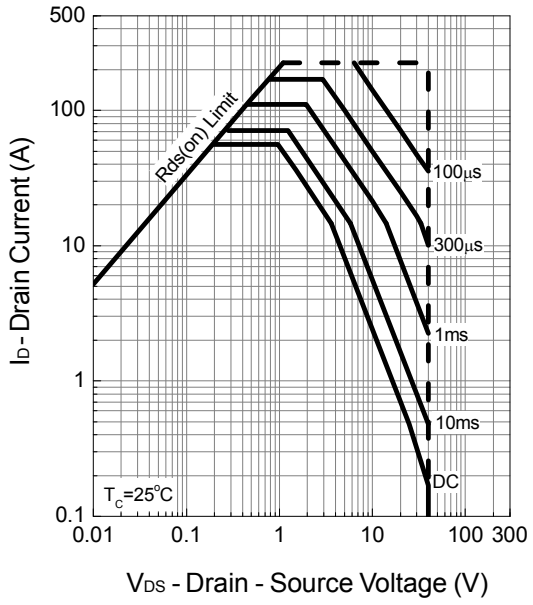
Power Dissipation



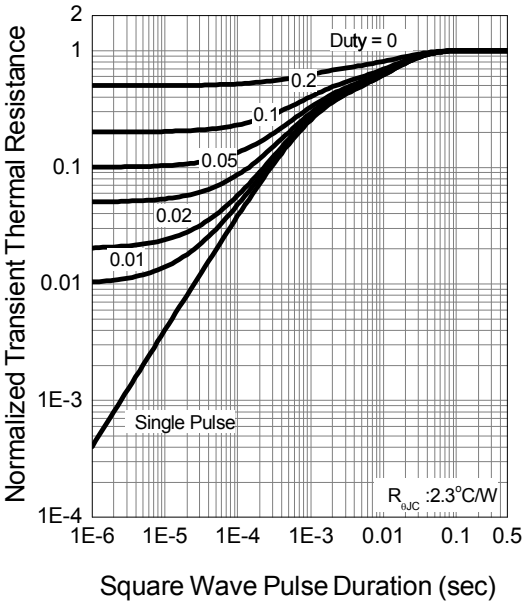
Drain Current



Safe Operation Area

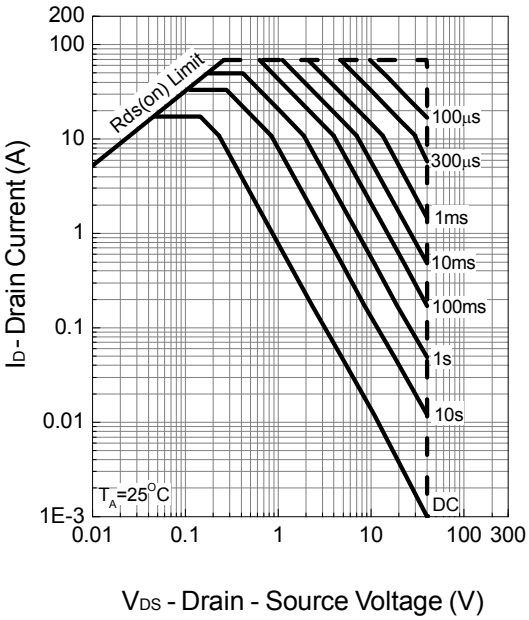


Thermal Transient Impedance

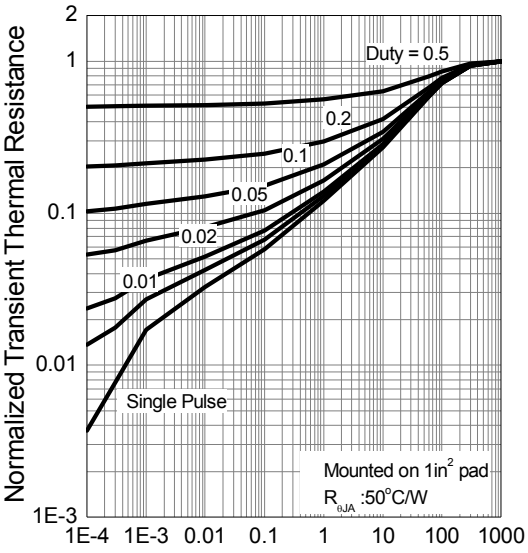


Typical Characteristics (Cont.)

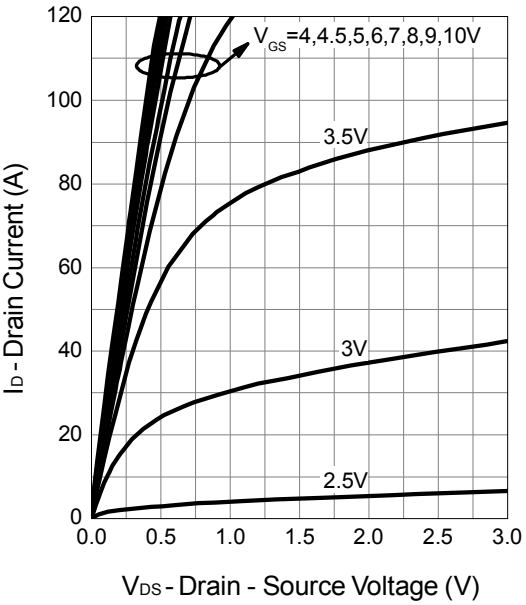
Safe Operation Area



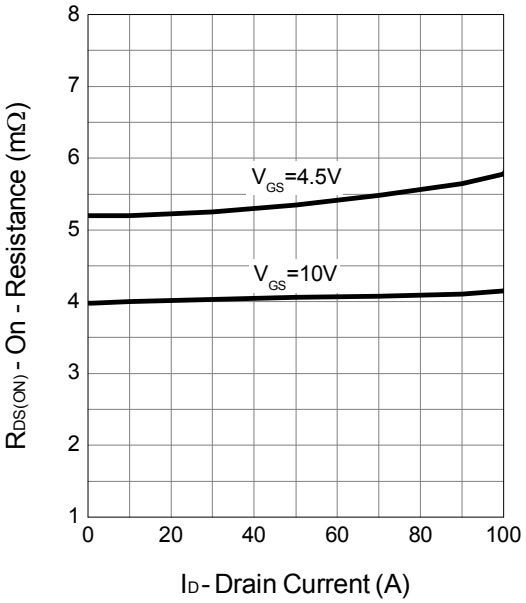
Thermal Transient Impedance



Output Characteristics

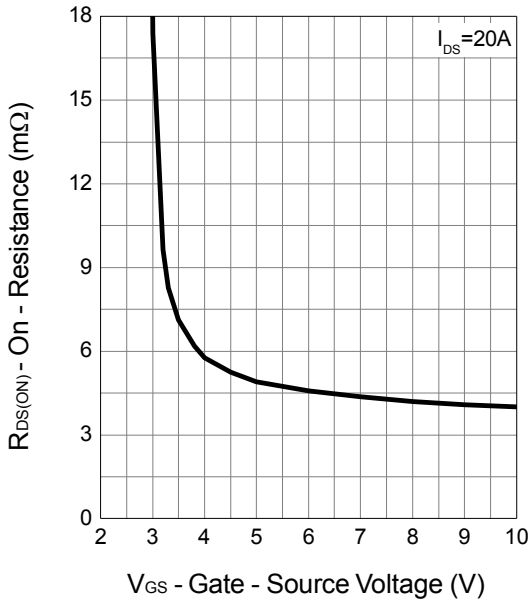


Drain-Source On Resistance

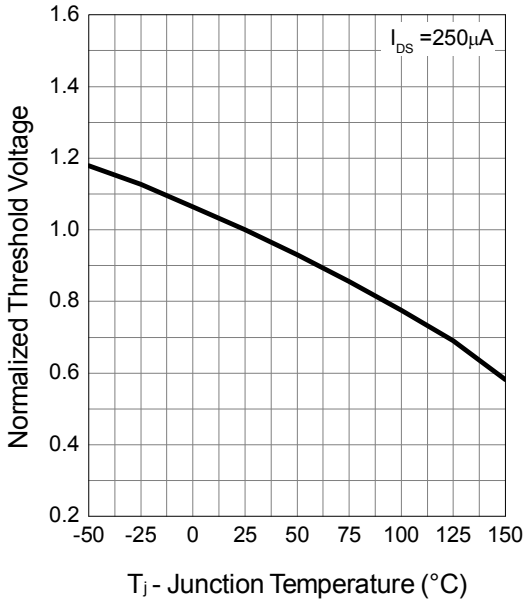


Typical Characteristics (Cont.)

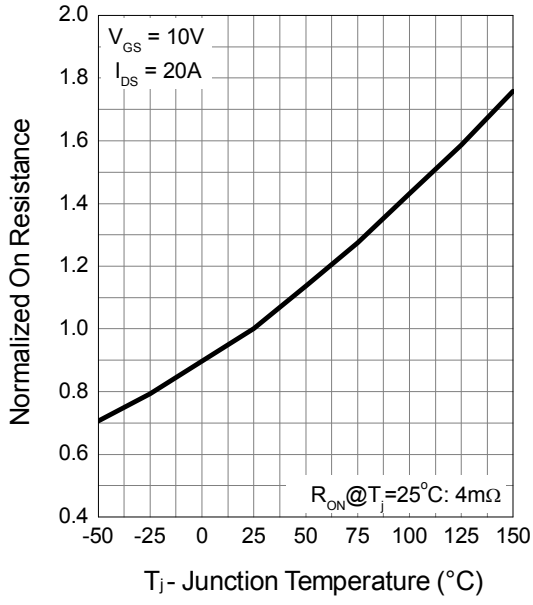
Gate-Source On Resistance



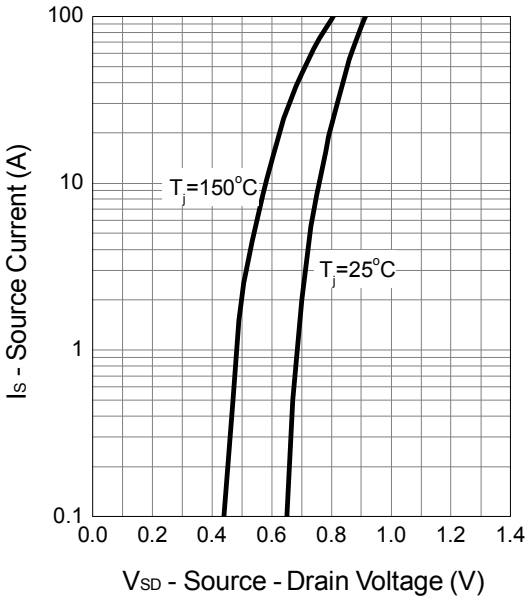
Gate Threshold Voltage



Drain-Source On Resistance

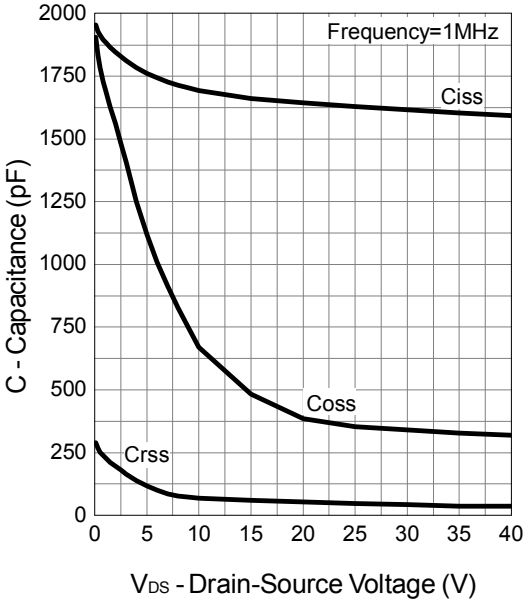


Source-Drain Diode Forward

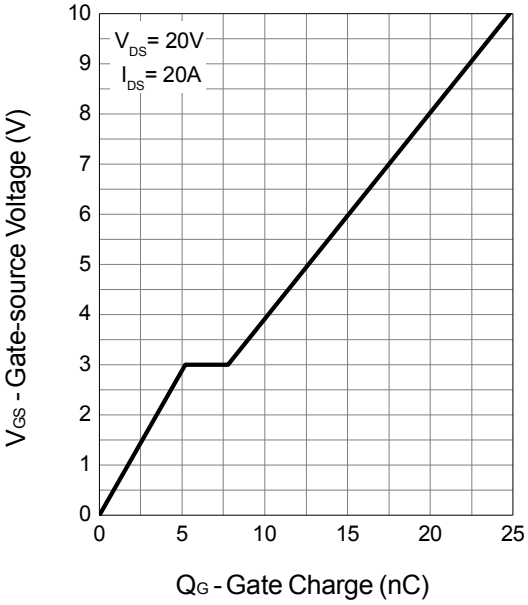


Typical Characteristics (Cont.)

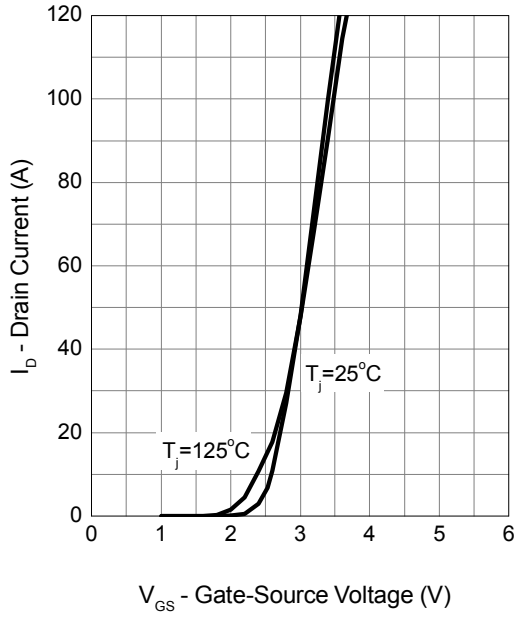
Capacitance



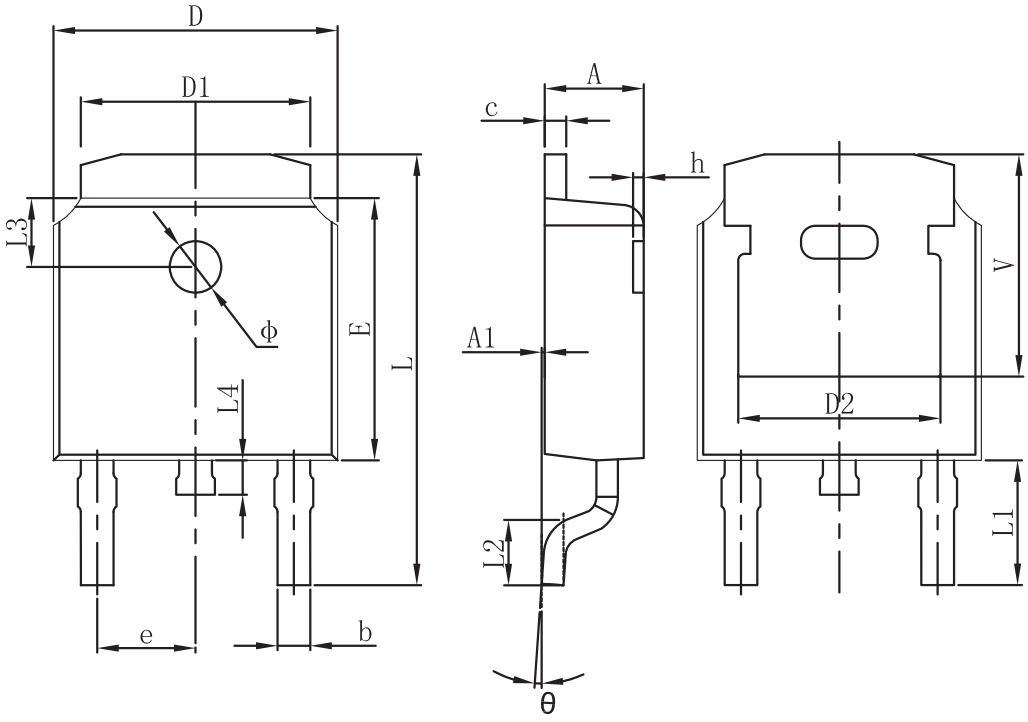
Gate Charge



Transfer Characteristics



Packaging information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

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