

■ Features

- High speed power switching
- 100% UIS tested, 100% Rg tested
- Enhanced avalanche ruggedness
- Lead free, halogen free

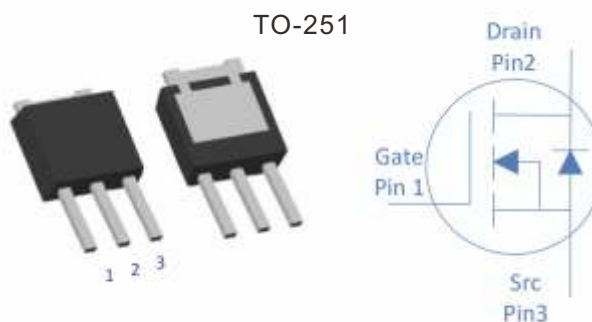
■ Application

- SMPS
- Hard switching and high speed circuit
- LED lighting
- Flyback

■ Main product characteristics

V_{DS}	700V
$R_{DS(on),max}$	1.8Ω
I_D	2A

■ Pin Description



■ Absolute Maximum Ratings ($T_A = 25^{\circ}\text{C}$ unless otherwise specified)

PARAMETER	CONDITIONS	Symbol	MJU02N70CT	UNIT
Continuous Drain Current	$T_c = 25^{\circ}\text{C}$	I_D	2	A
Drain to Source Voltage		V_{DS}	700	V
Gate to Source Voltage		V_{GS}	±30	V
Pulsed Drain Current		I_{DM}	5.8	A
Avalanche energy, single pulse	$L = 4.0\text{mH}$, $T_c = 25^{\circ}\text{C}$	E_{AS}	10	mJ
Power Dissipation	$T_c = 25^{\circ}\text{C}$	P_D	63	W
Operating and Storage Temperature		T_J, T_{STG}	-55 to 150	$^{\circ}\text{C}$

■ Absolute Maximum Ratings

PARAMETER	Symbol	MJU02N70CT	UNIT
Thermal Resistance Junction-case	$R_{\theta JC}$	2	$^{\circ}\text{C/W}$
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	55	$^{\circ}\text{C/W}$

■ Electrical characteristics($T_J = 25^\circ\text{C}$ unless otherwise specified)

■ Static Characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Drain to Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	$V_{(BR)DSS}$	700	-	-	V
Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 250\mu A$	$V_{GS(th)}$	2	3	4	
Zero Gate Voltage Drain Current	$V_{DS} = 700V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	I_{DSS}	-	-	1	μA
	$V_{DS} = 700V, V_{GS} = 0V, T_J = 150^\circ\text{C}$		-	10	-	
Gate to Source Leakage Current	$V_{GS} = \pm 30V, V_{DS} = 0V$	I_{GSS}	-	-	± 100	nA
Drain to Source On Resistance	$V_{GS} = 10V, I_D = 1.0A$	$R_{DS(on)}$	-	1.6	1.8	Ω
Gate Resistance	$V_{GS} = 0V, V_{DS}$ open, $f = 1\text{MHz}$	R_G	-	2.9	-	Ω

■ Dynamic Characteristics(note:5)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Input Capacitance	$V_{DS} = 100V, V_{GS} = 0V, F = 1\text{MHz}$	C_{iss}	-	236	-	pF
Output Capacitance		C_{oss}	-	12.7	-	
Reverse Transfer Capacitance		C_{rss}	-	0.8	-	
Total Gate Charge	$V_{DD} = 400V, I_D = 1.0A, V_{GS} = 10V$	Q_g	-	4.6	-	nC
Gate to Source Charge		Q_{gs}	-	1.0	-	
Gate to Drain (Miller) Charge		Q_{gd}	-	1.4	-	
Turn on Delay Time	$V_{DD} = 400V, I_D = 1.0A, V_{GS} = 10V, R_G = 25\Omega$	$t_{d(on)}$	-	23	-	ns
Rise Time		t_r	-	22	-	
Turn off Delay Time		$t_{d(off)}$	-	20	-	
Fall Time		t_f	-	25	-	

■ Reverse Diode Characteristics

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Diode Forward Voltage	$I_F = 1.0A, V_{GS} = 0V$	V_{SD}	-	0.9	1.2	V
Reverse Recovery Time	$V_R = 300V, I_F = 1.0A, dI_F/dt = 100A/\mu s$	t_{rr}	-	400	-	ns
Reverse Recovery Charge		Q_{rr}	-	0.5	-	μC

■ Rating and characteristics curve

Fig 1. Typical Output Characteristics

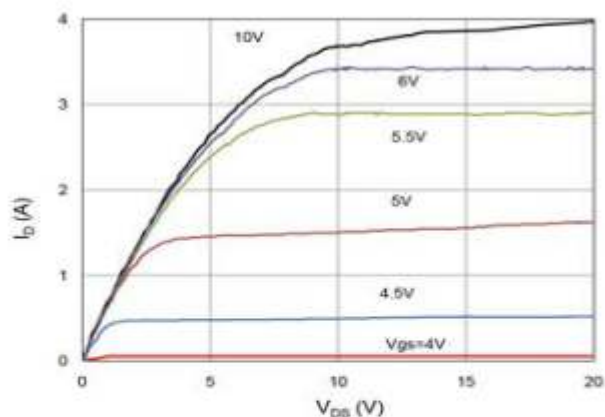


Figure 2. On-Resistance vs. Gate-Source Voltage

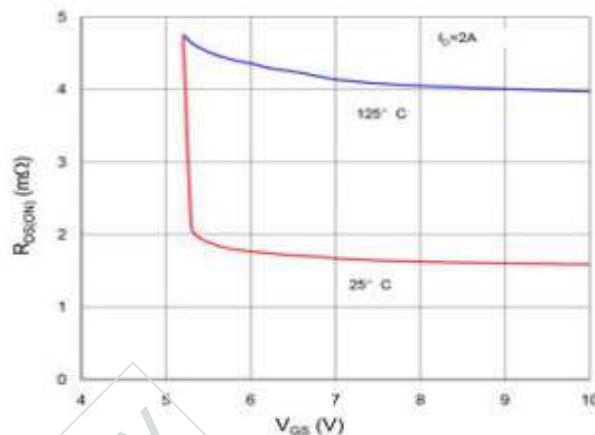


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

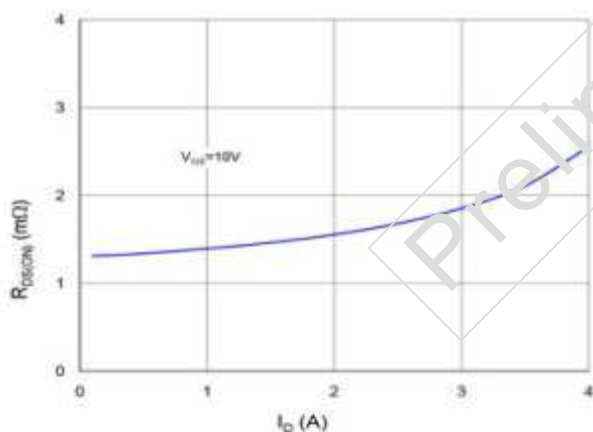


Figure 4. Normalized On-Resistance vs. Junction Temperature

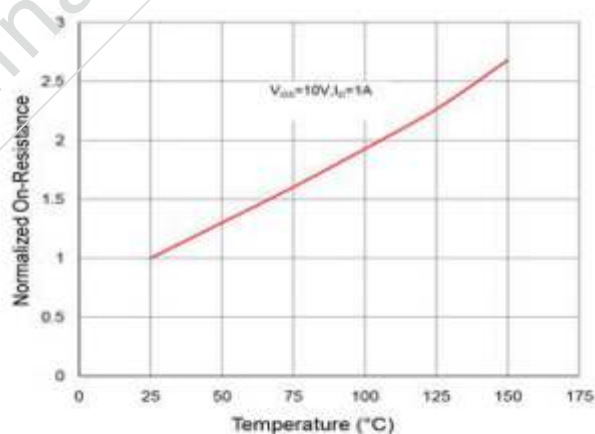


Figure 5. Typical Transfer Characteristics

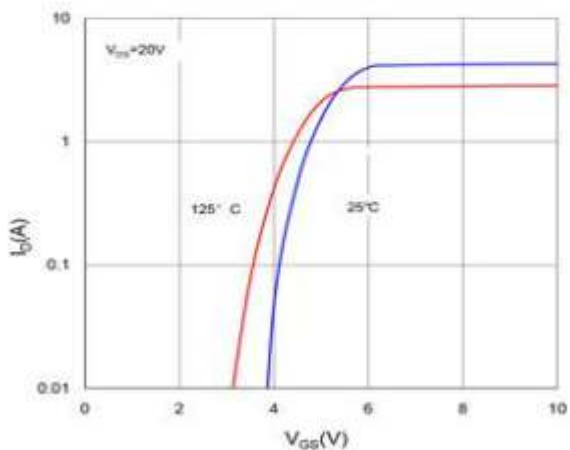
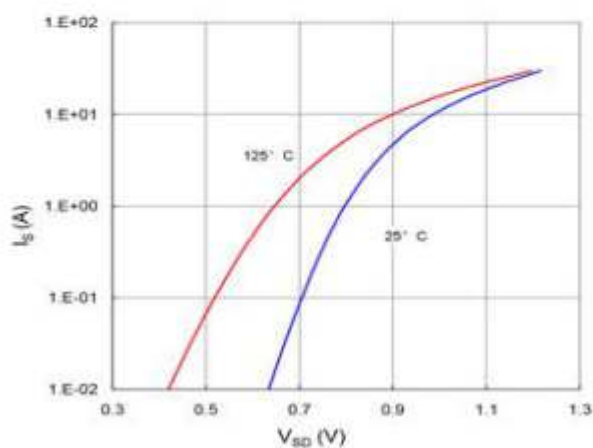


Figure 6. Typical Source-Drain Diode Forward Voltage



■ Rating and characteristics curve

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

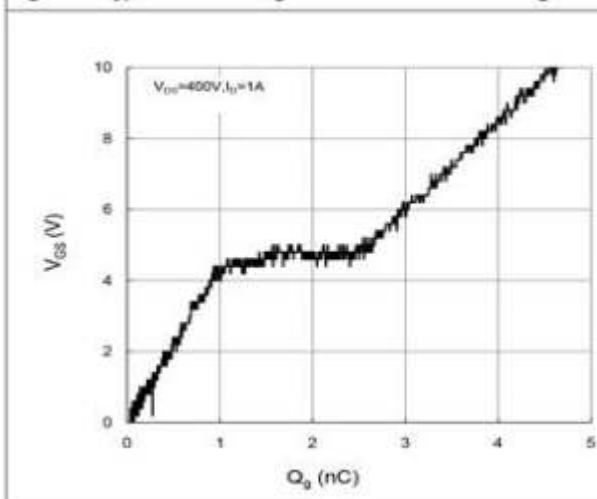


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

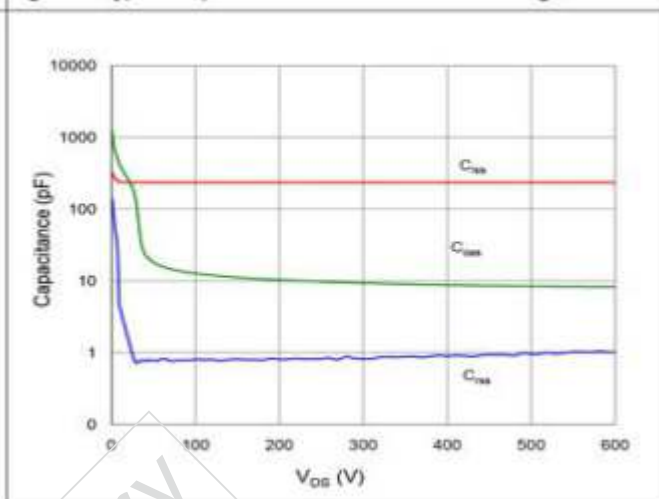


Figure 9. Maximum Safe Operating Area

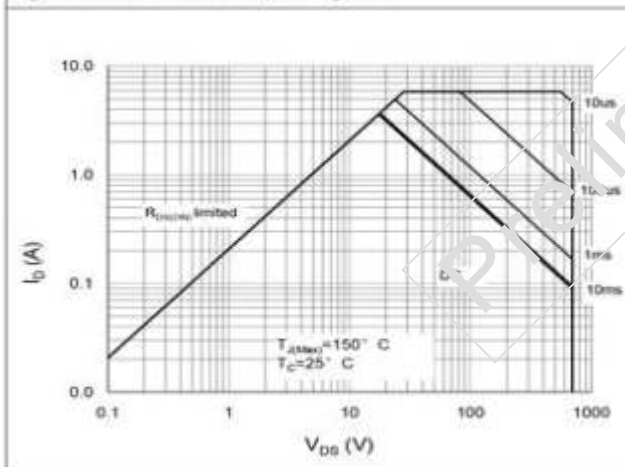


Figure 10. Maximum Drain Current vs. Case Temperature

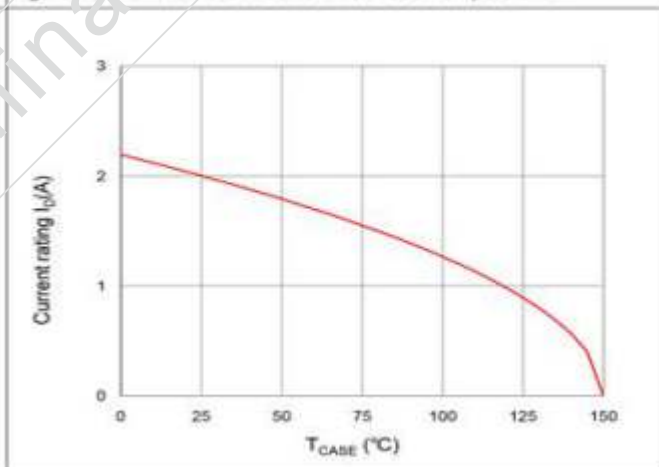
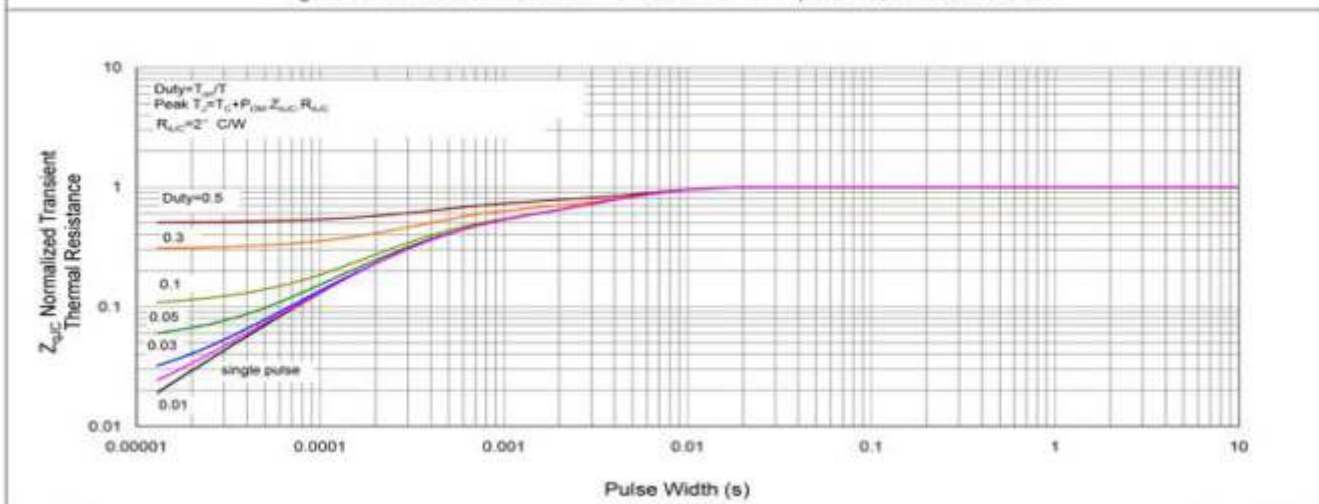
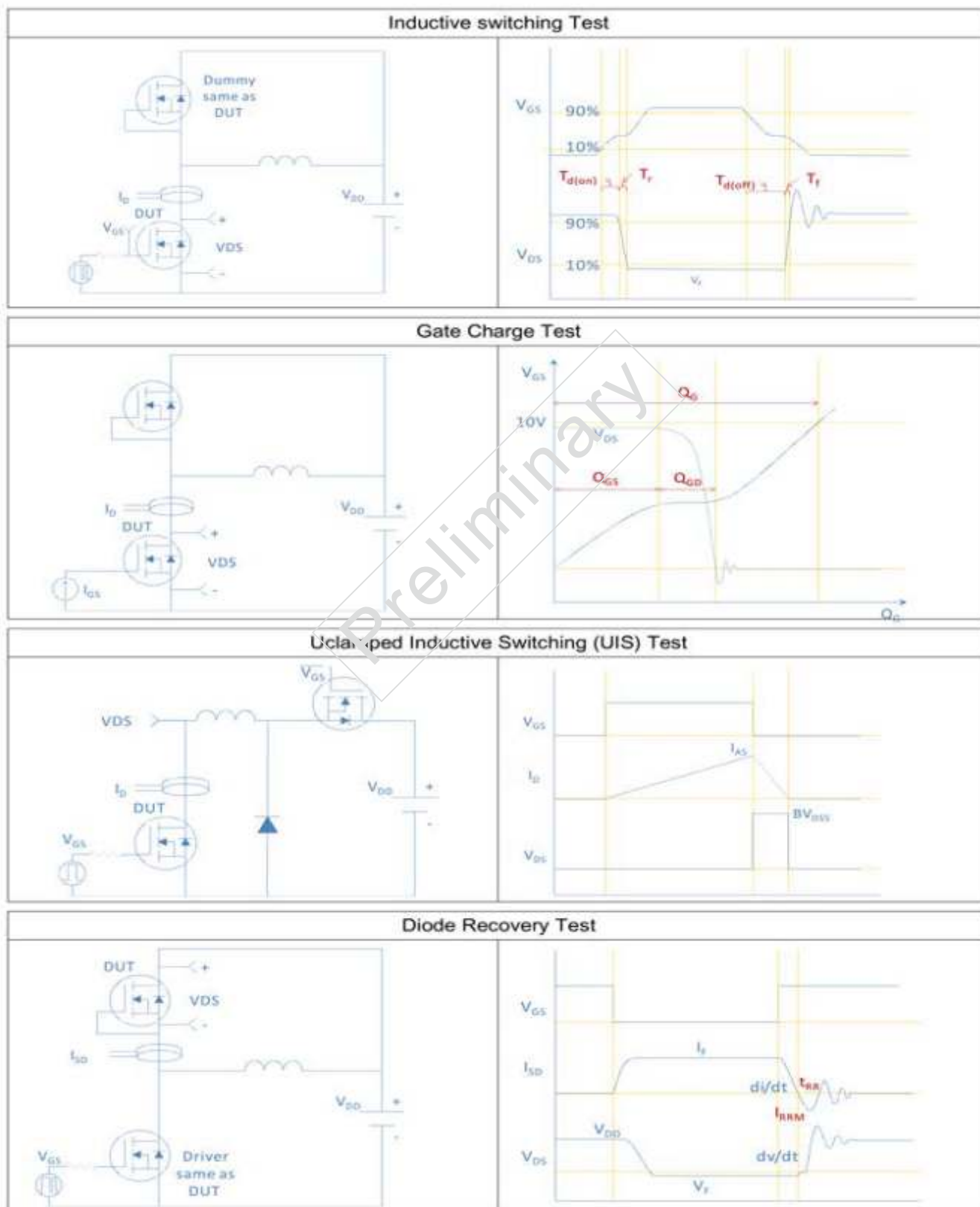


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case

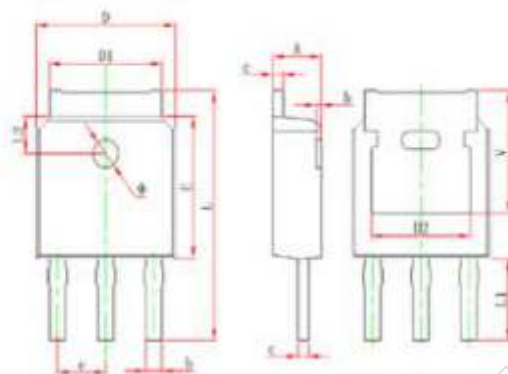


■ Rating and characteristics curve



■ Package Outline

TO-251, 3 leads



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
b	0.660	0.860	0.026	0.034
c	0.480	0.580	0.019	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	10.400	11.000	0.409	0.433
L1	3.500 REF.		0.138 REF.	
L2	1.600 REF.		0.063 REF.	
Φ	1.100	1.300	0.043	0.051
h	0.000	0.300	0.000	0.012
V	5.210 REF.		0.211 REF.	

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Preliminary