

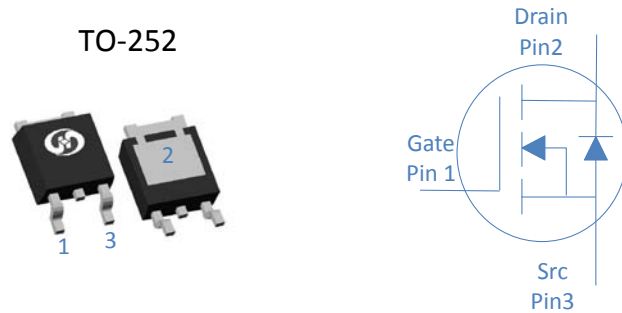
**150V N-Ch Power MOSFET**
**Feature**

- ◇ High Speed Power Switching
- ◇ Enhanced Body diode dv/dt capability
- ◇ Enhanced Avalanche Ruggedness
- ◇ 100% UIS Tested, 100% Rg Tested
- ◇ Lead Free

**Application**

- ◇ Synchronous Rectification in SMPS
- ◇ Hard Switching and High Speed Circuit
- ◇ Power Tools
- ◇ UPS
- ◇ Motor Control

$V_{DS}$	150	V
$R_{DS(on),typ}$ $V_{GS}=10V$	65	m $\Omega$
$I_D$	18	A



Part Number	Package	Marking
HGD750N15M	TO-252	GD750N15M

**Absolute Maximum Ratings at  $T_j=25^\circ\text{C}$  (unless otherwise specified)**

Parameter	Symbol	Conditions	Value	Unit
Continuous Drain Current (Silicon Limited)	$I_D$	$T_C=25^\circ\text{C}$	18	A
		$T_C=100^\circ\text{C}$	13	
Drain to Source Voltage	$V_{DS}$	-	150	V
Gate to Source Voltage	$V_{GS}$	-	$\pm 20$	V
Pulsed Drain Current	$I_{DM}$	-	40	A
Avalanche Energy, Single Pulse	$E_{AS}$	$L=0.3\text{mH}, T_C=25^\circ\text{C}$	3.75	mJ
Power Dissipation	$P_D$	$T_C=25^\circ\text{C}$	60	W
Operating and Storage Temperature	$T_J, T_{stg}$	-	-55 to 175	$^\circ\text{C}$

**Absolute Maximum Ratings**

Parameter	Symbol	Max	Unit
Thermal Resistance Junction-Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	60	$^\circ\text{C/W}$

**Electrical Characteristics at  $T_j=25^\circ\text{C}$  (unless otherwise specified)**
**Static Characteristics**

Parameter	Symbol	Conditions	Value			Unit
			min	typ	max	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	150	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2	3.2	4	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS}=0V, V_{DS}=150V, T_j=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{GS}=0V, V_{DS}=150V, T_j=100^\circ\text{C}$	-	-	100	
Gate to Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
Drain to Source on Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=10A$	-	65	75	$m\Omega$
Transconductance	$g_{fs}$	$V_{DS}=5V, I_D=10A$	-	12	-	S
Gate Resistance	$R_G$	$V_{GS}=0V, V_{DS}$ Open, $f=1\text{MHz}$	-	5.0	-	$\Omega$

**Dynamic Characteristics**

Input Capacitance	$C_{iss}$	$V_{GS}=0V, V_{DS}=75V, f=1\text{MHz}$	-	616	-	$\mu F$
Output Capacitance	$C_{oss}$		-	35	-	
Reverse Transfer Capacitance	$C_{rss}$		-	13	-	
Total Gate Charge	$Q_g$	$V_{DD}=75V, I_D=10A, V_{GS}=10V$	-	11	-	nC
Gate to Source Charge	$Q_{gs}$		-	2.4	-	
Gate to Drain (Miller) Charge	$Q_{gd}$		-	4	-	
Turn on Delay Time	$t_{d(on)}$	$V_{DD}=75V, I_D=10A, V_{GS}=10V, R_G=10\Omega,$	-	12	-	ns
Rise time	$t_r$		-	8	-	
Turn off Delay Time	$t_{d(off)}$		-	14	-	
Fall Time	$t_f$		-	3	-	

**Reverse Diode Characteristics**

Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_F=10A$	-	0.9	1.2	V
Reverse Recovery Time	$t_{rr}$	$V_R=75V, I_F=10A, di_F/dt=100A/\mu s$	-	60	-	ns
Reverse Recovery Charge	$Q_{rr}$		-	168	-	nC

Figure 1. Typical Output Characteristics

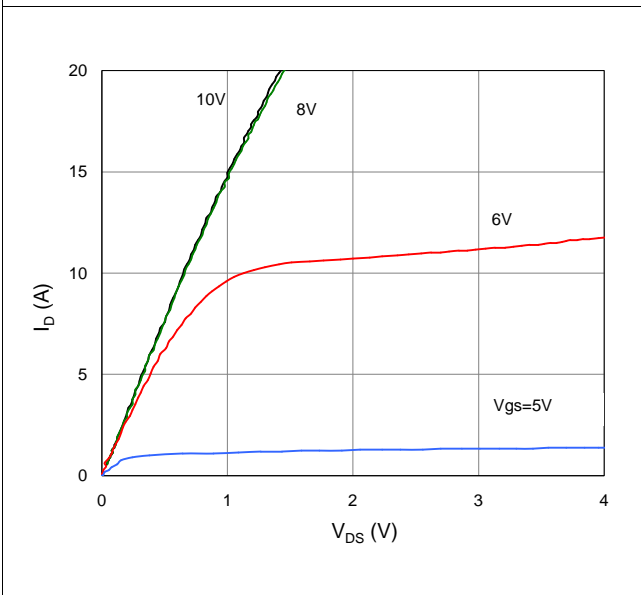


Figure 2. On-Resistance vs. Gate-Source Voltage

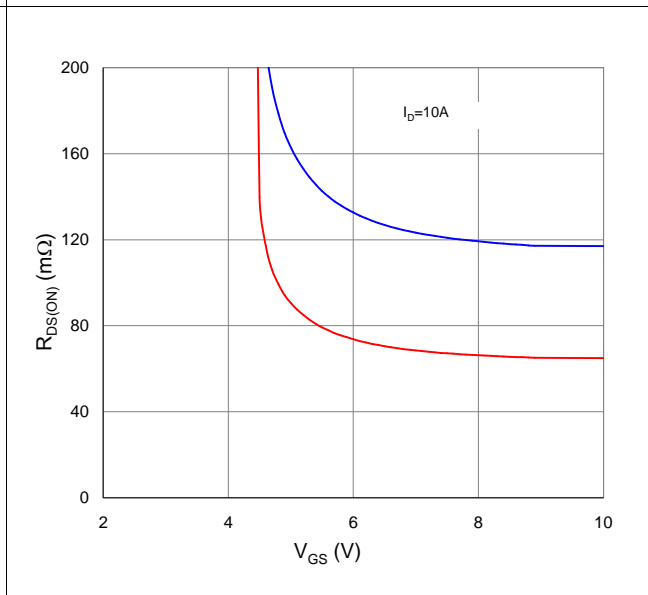


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

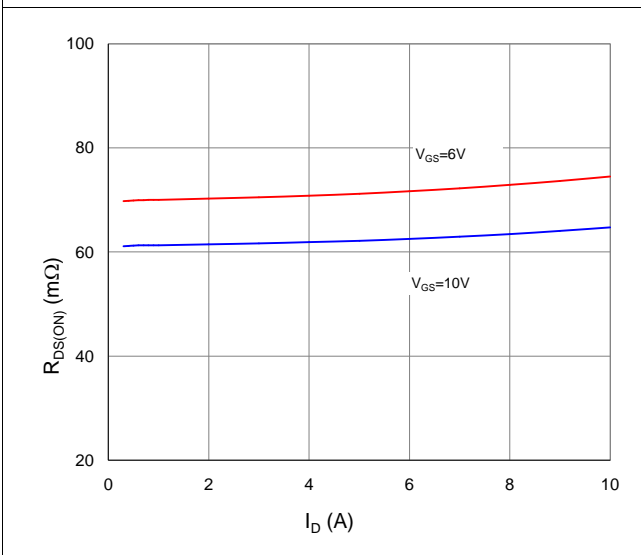


Figure 4. Normalized On-Resistance vs. Junction Temperature

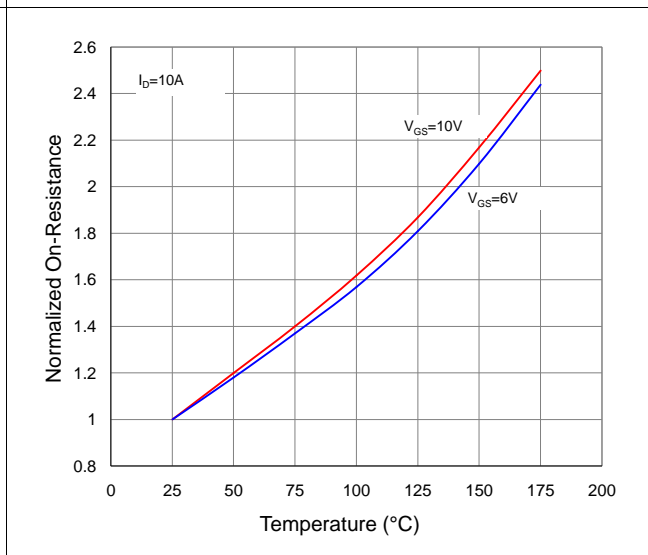


Figure 5. Typical Transfer Characteristics

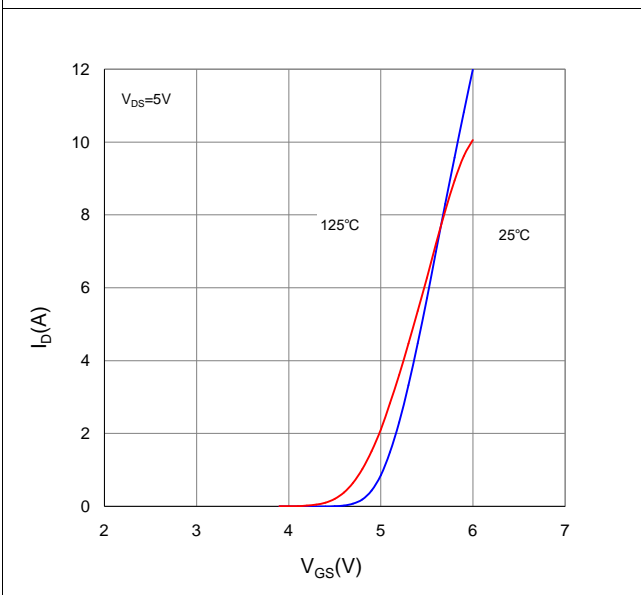


Figure 6. Typical Source-Drain Diode Forward Voltage

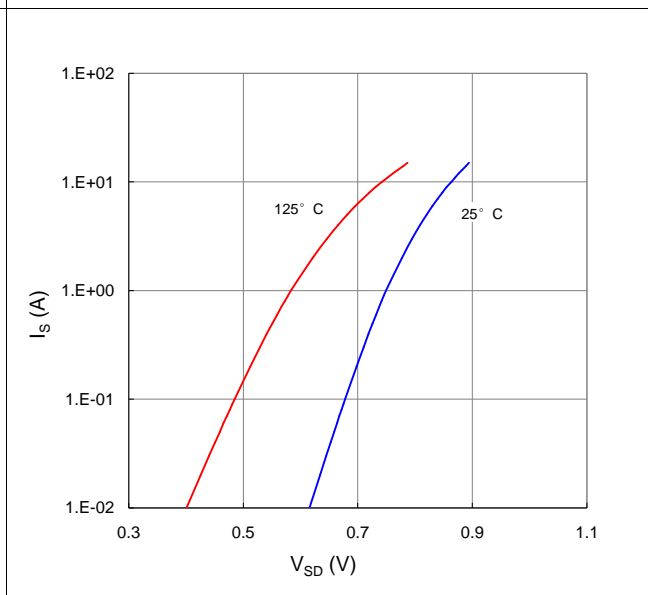


Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

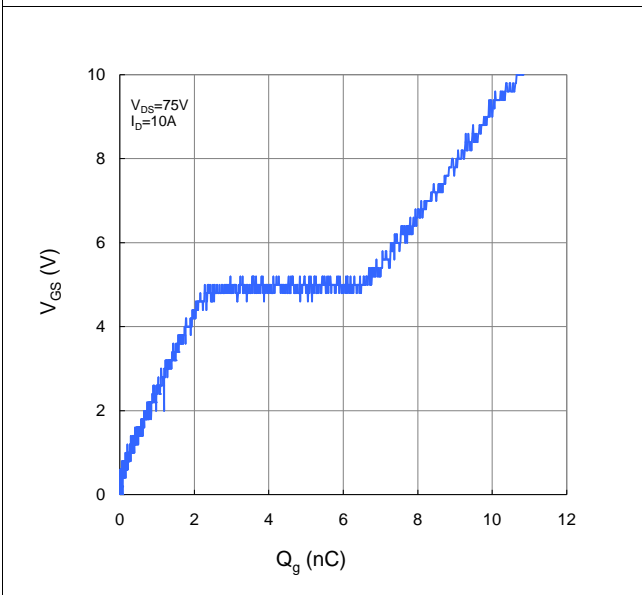


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

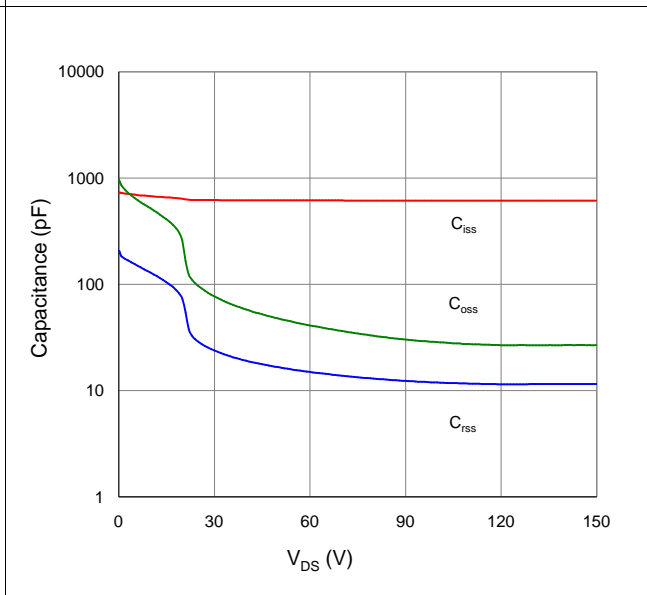


Figure 9. Maximum Safe Operating Area

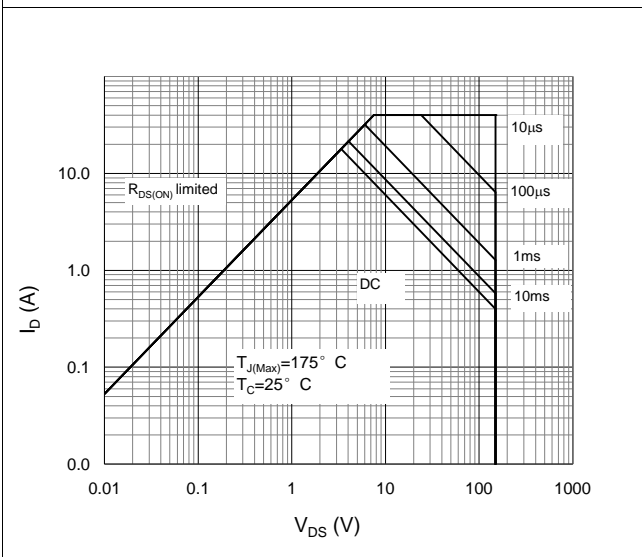


Figure 10. Maximum Drain Current vs. Case Temperature

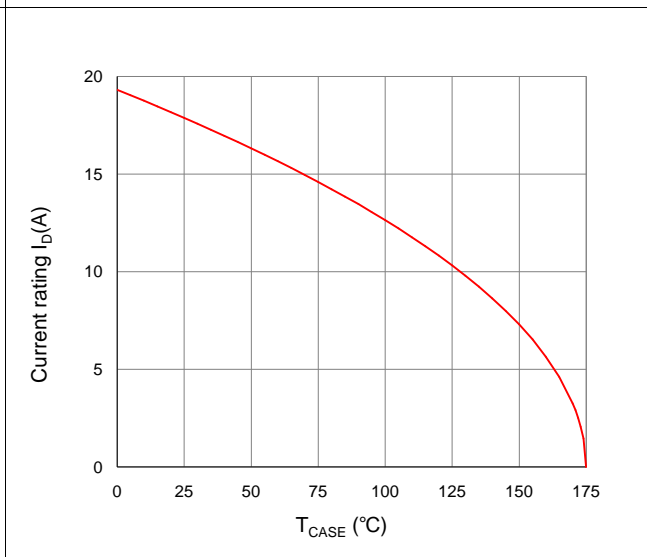
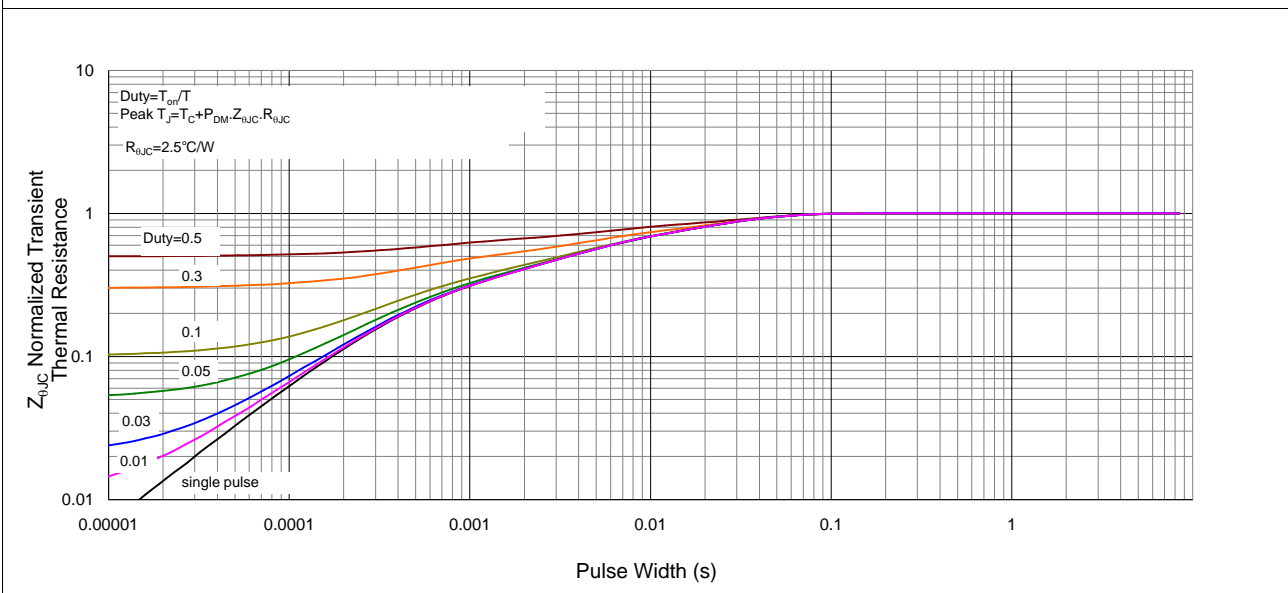
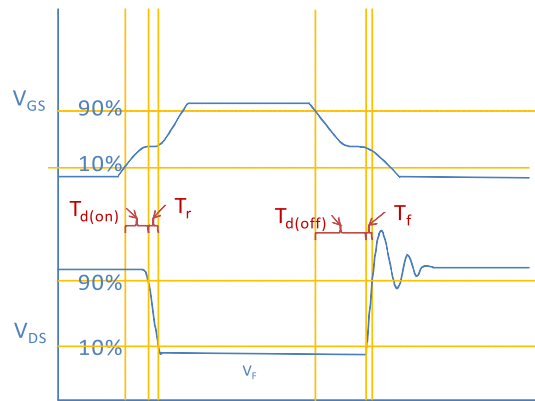


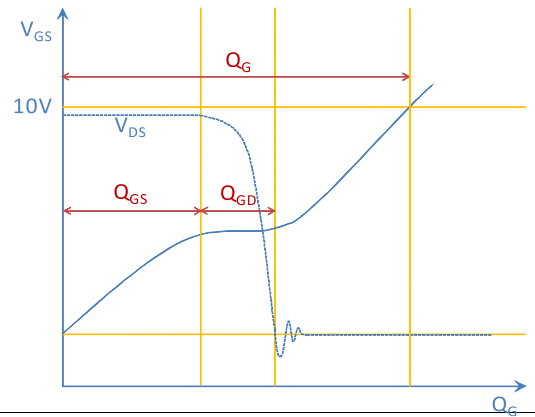
Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



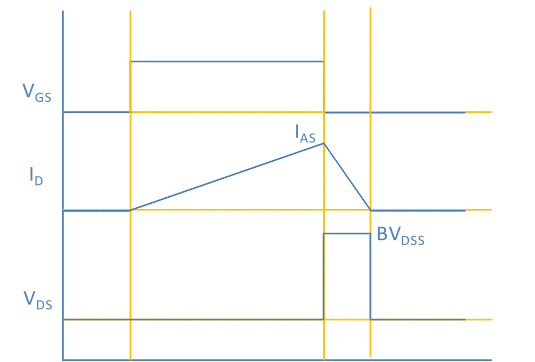
### Inductive switching Test



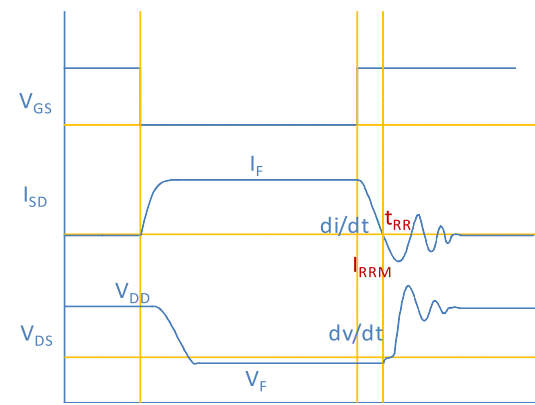
### Gate Charge Test



### Uclamped Inductive Switching (UIS) Test

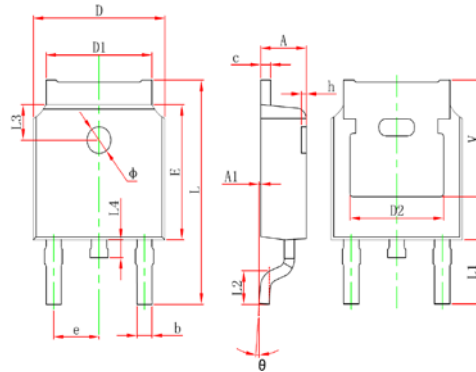


### Diode Recovery Test



Package Outline

TO-252, 2 leads



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	0.660	0.860	0.026	0.034
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	9.800	10.400	0.386	0.409
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	5.350 REF.		0.211 REF.	