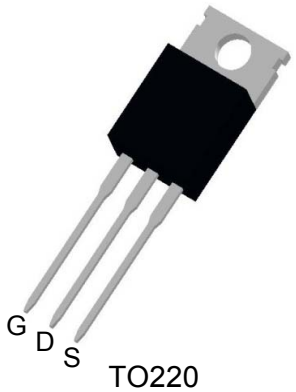
RUH1H100R

N-Channel Advanced Power MOSFET

Features

- 100V/100A,
  $R_{DS\ (ON)}$ =5.2mΩ(Typ.)@V_{GS}=10V
- Advanced HEFET® Technology
- Ultra Low On-Resistance
- Excellent Q_gx$R_{DS(on)}$ Product
- 100% avalanche tested
- 175°C Operating Temperature
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



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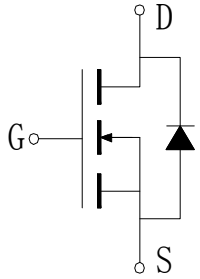


N-Channel MOSFET

Applications

- Motor Drives
- Uninterruptible Power Supplies
- Synchronus Rectification in DC/DC and AC/DC Converters

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		100	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C=25°C	100	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	400	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	100	A
		T_C=100°C	71	
P_D	Maximum Power Dissipation	T_C=25°C	174	W
		T_C=100°C	87	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.86	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		62.5	°C/W
Drain-Source Avalanche Ratings				
E_{AS} ③	Avalanche Energy, Single Pulsed		306	mJ

Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RUH1H100R			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	100			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	2		4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$④	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=50A		5.2	6.5	mΩ
Diode Characteristics						
V_{SD}④	Diode Forward Voltage	I_{SD}=50A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=50A, dI_{SD}/dt=100A/μs		30		ns
Q_{rr}	Reverse Recovery Charge			370		nC
Dynamic Characteristics⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.3		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=50V, Frequency=1.0MHz		2900		pF
C_{oss}	Output Capacitance			350		
C_{rss}	Reverse Transfer Capacitance			47		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=50V,I_{DS}=50A, V_{GEN}=10V,R_G=4.7Ω		39		ns
t_r	Turn-on Rise Time			47		
$t_{d(OFF)}$	Turn-off Delay Time			63		
t_f	Turn-off Fall Time			21		
Gate Charge Characteristics⑤						
Q_g	Total Gate Charge	V_{DS}=80V, V_{GS}=10V, I_{DS}=50A		47		nC
Q_{gs}	Gate-Source Charge			15		
Q_{gd}	Gate-Drain Charge			12		

Notes:

①Pulse width limited by safe operating area.

②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 75A.

③Limited by T_{Jmax}, I_{AS} =35A, V_{DD} = 48V, R_G = 50Ω , Starting T_J = 25°C.

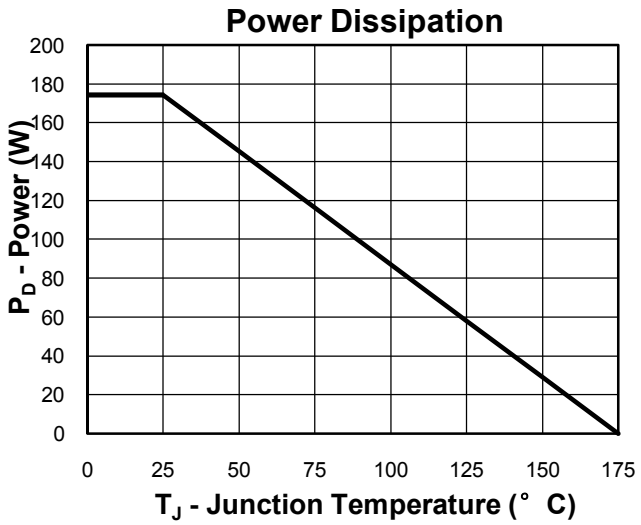
④Pulse test;Pulse width≤300μs, duty cycle≤2%.

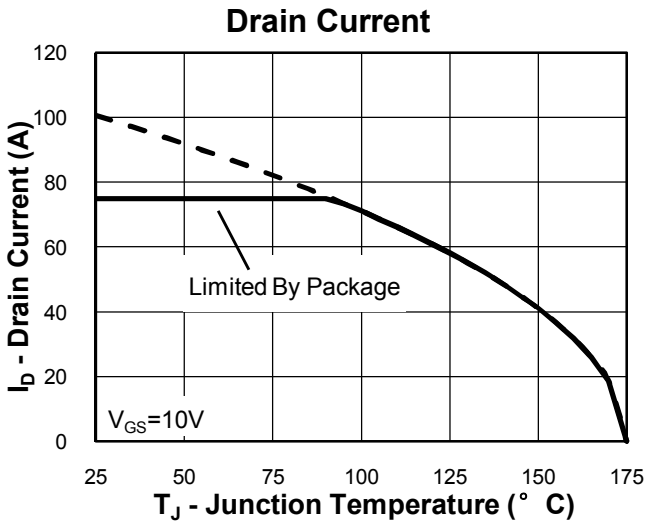
⑤Guaranteed by design, not subject to production testing.

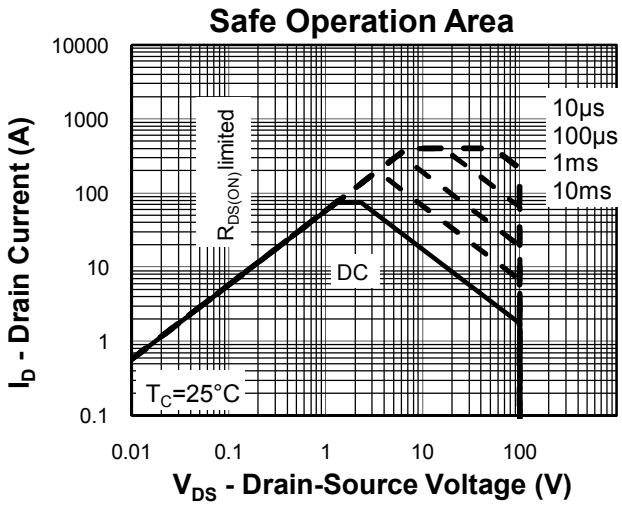
Ordering and Marking Information

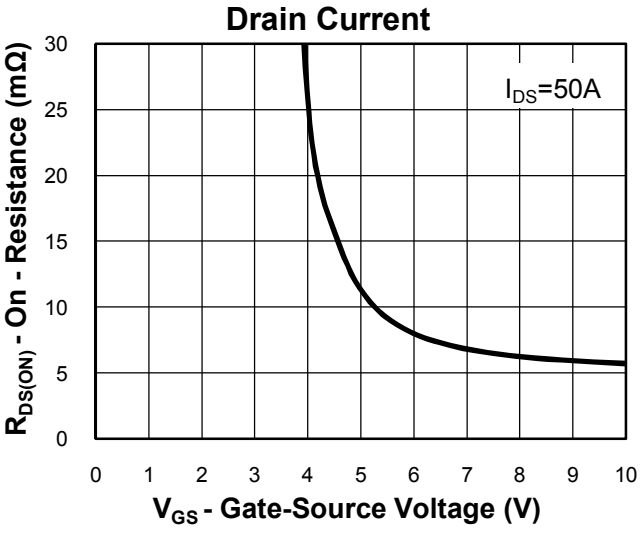
Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RUH1H100R	RUH1H100R	TO220	Tube	50	-	-

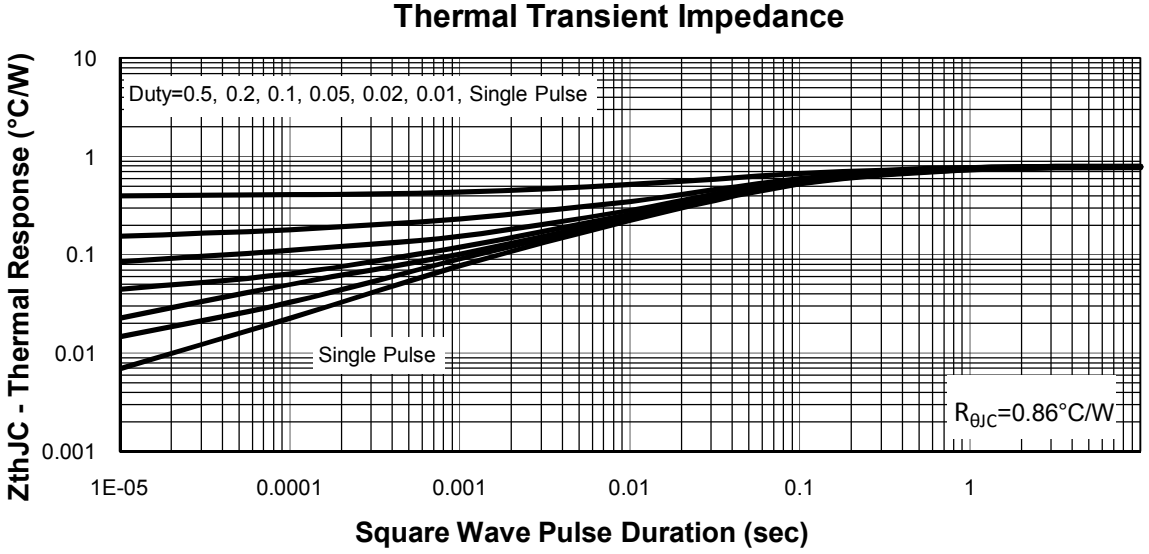
Typical Characteristics











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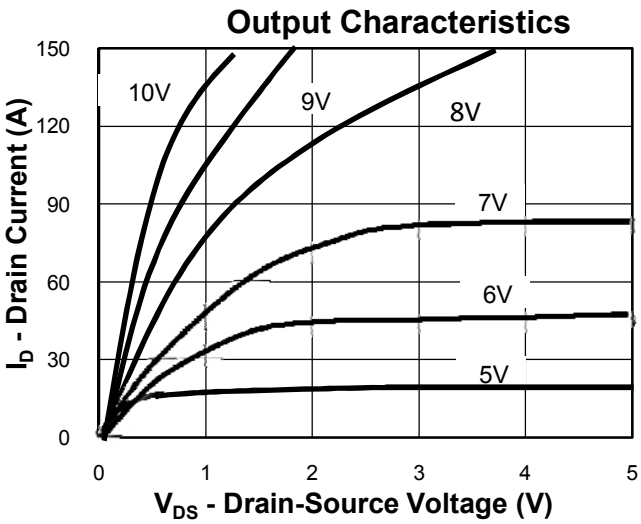
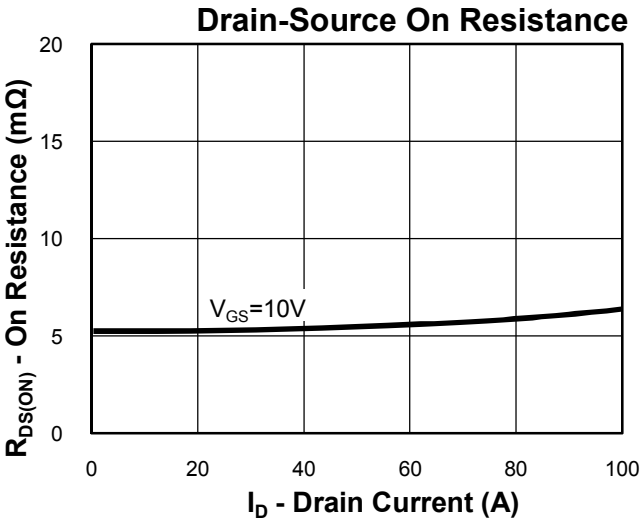
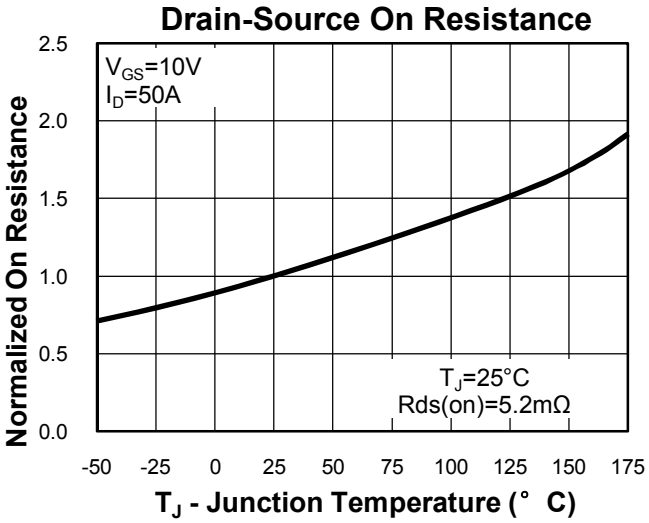
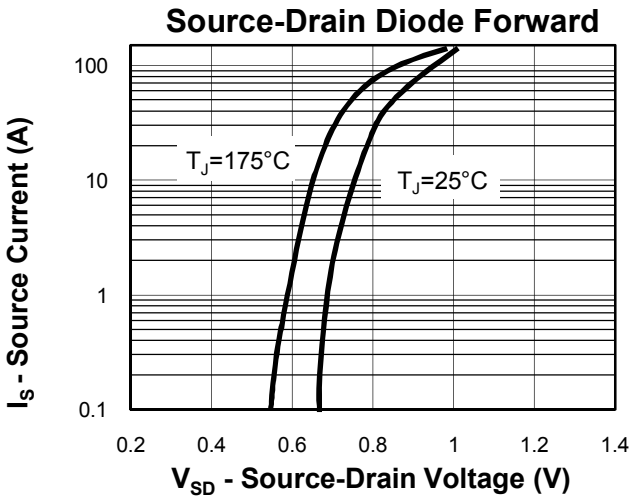
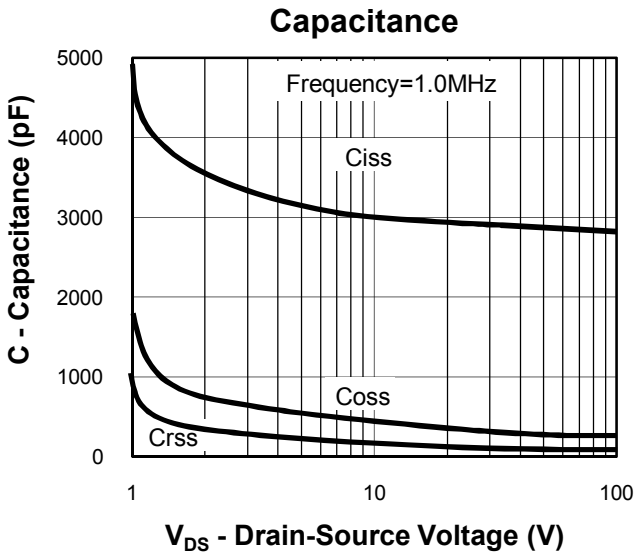
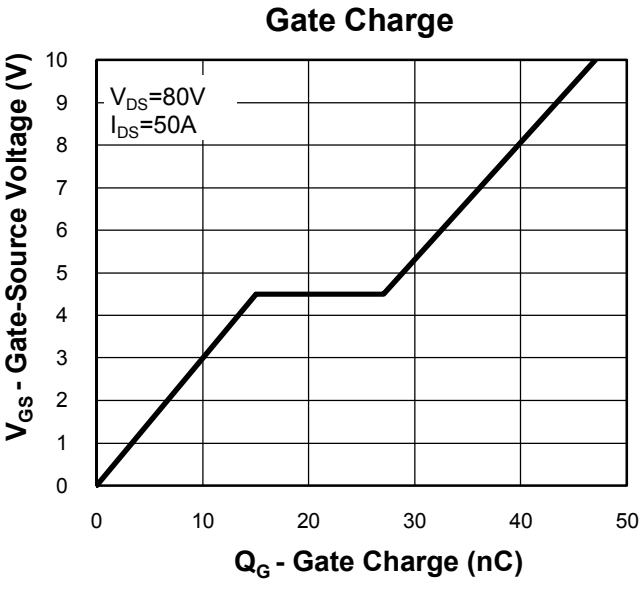




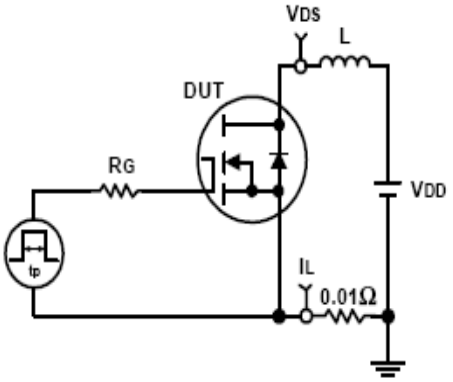


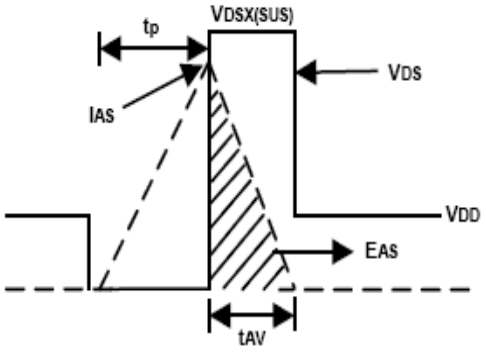




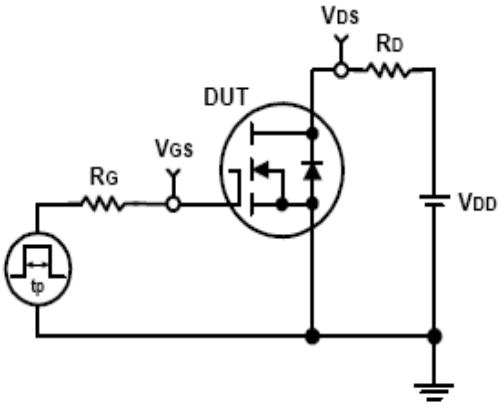


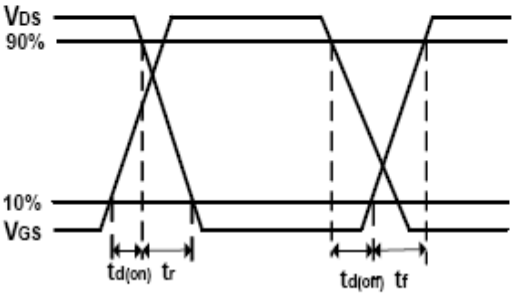
Avalanche Test Circuit and Waveforms





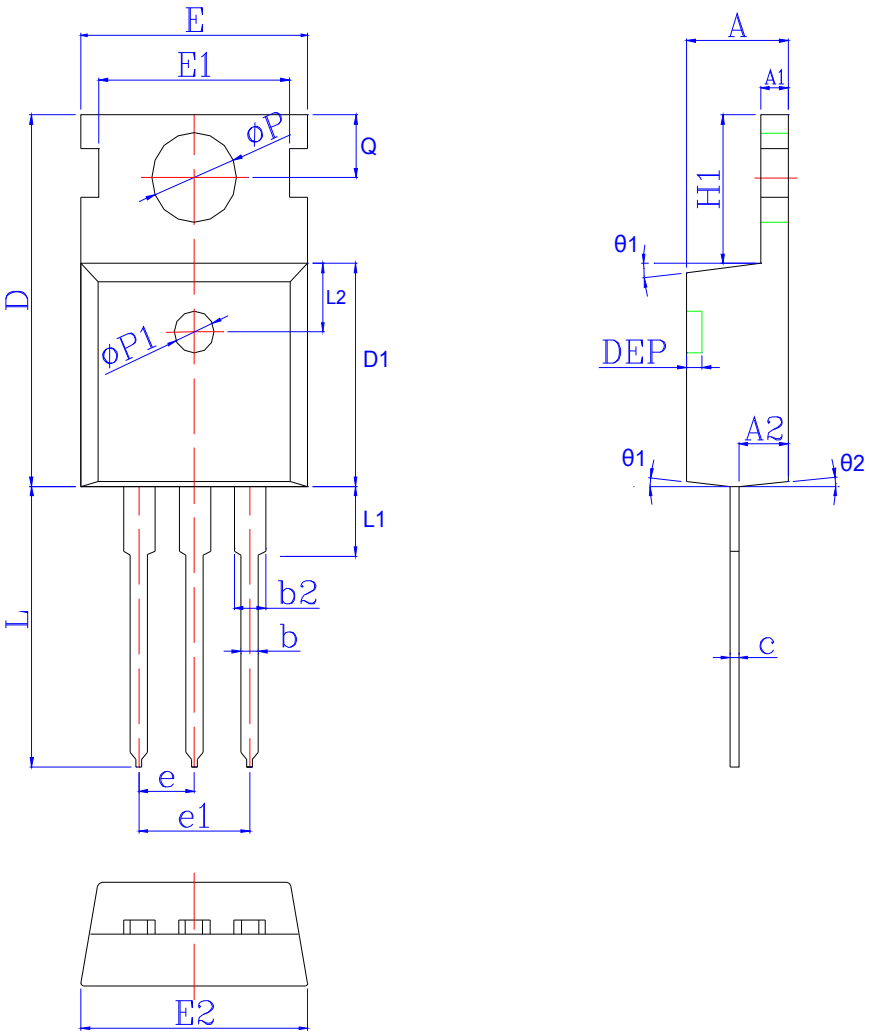
Switching Time Test Circuit and Waveforms





Package Information

TO220



SYMBOL	MM			INCH			SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX		MIN	NOM	MAX	MIN	NOM	MAX
A	4.30	4.54	4.77	0.169	0.179	0.188	Φp1	1.40	1.50	1.60	0.055	0.059	0.063
A1	1.15	1.30	1.40	0.045	0.051	0.055	e	2.54 BSC			0.10 BSC		
A2	1.90	2.25	2.60	0.075	0.089	0.102	e1	5.08 BSC			0.20 BSC		
b	0.60	0.80	1.00	0.024	0.031	0.039	H1	6.30	6.50	6.80	0.248	0.256	0.268
b2	1.17	1.28	1.72	0.046	0.050	0.068	L	12.70	13.18	13.65	0.500	0.519	0.537
c	0.40	0.50	0.60	0.016	0.020	0.024	L1	*	*	3.95	*	*	0.156
D	15.40	15.70	16.00	0.606	0.618	0.630	L2	2.50 REF			0.098 REF		
D1	8.96	9.21	9.46	0.353	0.363	0.372	Φp	3.50	3.60	3.75	0.138	0.142	0.148
DEP	*	*	0.30	*	*	0.012	Q	2.70	2.80	3.20	0.106	0.110	0.126
E	9.66	9.97	10.28	0.380	0.393	0.405	θ1	5°	7°	9°	5°	7°	9°
E1	*	8.70	*	*	0.343	*	θ2	1°	3°	5°	1°	3°	5°
E2	9.80	10.00	10.20	0.386	0.394	0.402							

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