

General Features

- Advanced Trench MOS Technology
- Low On-Resistance
- 100% avalanche tested
- Fast Switching Speed
- Excellent package for good heat dissipation

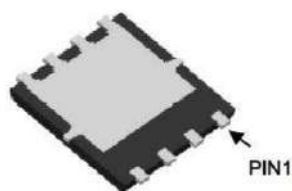
Application

- DC/DC Converters
- On board power for server
- Synchronous rectification

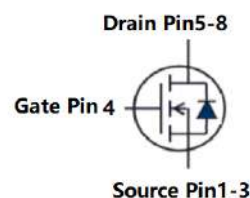
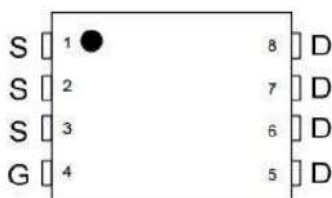
Product Summary



VDS	60	V
RDS(on).Typ@ VGS=10 V	4.4	mΩ
ID	90	A



DFN5x6-8



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	60	V
V _{GS}	Gate-Source Voltage	±20	V
I _D @T _C =25°C	Continuous Drain Current ^{1,6}	90	A
I _D @T _C =100°C		74	A
I _{DM}	Pulsed Drain Current ²	360	A
EAS	Single Pulse Avalanche Energy ³	125	mJ
I _S	Avalanche Current	90	A
P _D @T _C =25°C	Total Power Dissipation ⁴	113	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-ambient ¹ (t≤10S)	---	26	°C/W
	Thermal Resistance Junction-ambient ¹ (Steady State)	---	62	°C/W
R _{θJC}	Thermal Resistance Junction-case ¹	---	1.1	°C/W

Electrical Characteristics (T_J=25 °C, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250uA	60	---	---	V
R _{DS(ON)}	Static Drain-Source On-Resistance ²	V _{GS} =10V, I _D =20A	---	4.4	5.2	mΩ
		V _{GS} =4.5V, I _D =10A	---	6.4	7.8	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} =V _{DS} , I _D =250uA	1.2	1.4	2.3	V
I _{DSS}	Drain-Source Leakage Current	V _{DS} =48V, V _{GS} =0V, T _J =25°C	---	---	1	uA
		V _{DS} =48V, V _{GS} =0V, T _J =55°C	---	---	5	
I _{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0V	---	---	±100	nA
R _g	Gate Resistance	V _{DS} =0V, V _{GS} =0V, f=1MHz	---	1.3	---	Ω
Q _g	Total Gate Charge (10V)	V _{DS} =30V, V _{GS} =10V, I _D =20A	---	33.4	---	nC
Q _g	Total Gate Charge (4.5V)		---	17.8	---	
Q _{gs}	Gate-Source Charge		---	5.8	---	
Q _{gd}	Gate-Drain Charge		---	7.9	---	
T _{d(on)}	Turn-On Delay Time	V _{DD} =30V, V _{GS} =10V, R _G =3.3Ω, I _D =20A	---	7.5	---	ns
T _r	Rise Time		---	6	---	
T _{d(off)}	Turn-Off Delay Time		---	29	---	
T _f	Fall Time		---	7.5	---	
C _{iss}	Input Capacitance	V _{DS} =30V, V _{GS} =0V, f=1MHz	---	1625	---	pF
C _{oss}	Output Capacitance		---	438	---	
C _{rss}	Reverse Transfer Capacitance		---	25	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I _S	Continuous Source Current ^{1,5,6}	V _G =V _D =0V, Force Current	---	---	116	A
V _{SD}	Diode Forward Voltage ²	V _{GS} =0V, I _S =1A, T _J =25°C	---	---	1.2	V
t _{rr}	Reverse Recovery Time	I _F =20A, dI/dt=400A/μs, T _J =25°C	---	23	---	nS
Q _{rr}	Reverse Recovery Charge	T _J =25°C	---	60	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.
2. Single pulse width limited by junction temperature T_{J(MAX)}=150°C.
- 3.The EAS data shows Max. rating . The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=43A
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.
- 6.The maximum current rating is package limited.

Test Circuit

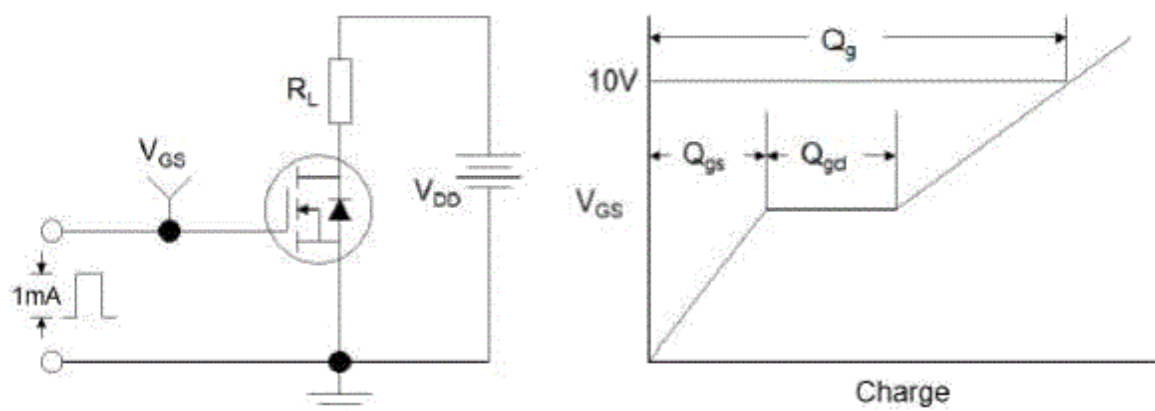


Figure1:Gate Charge Test Circuit & Waveform

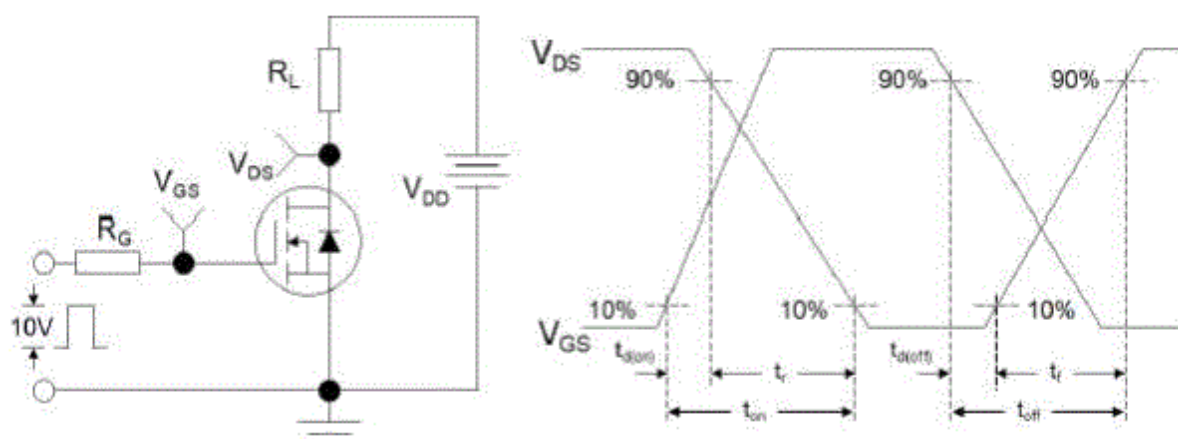


Figure 2: Resistive Switching Test Circuit & Waveforms

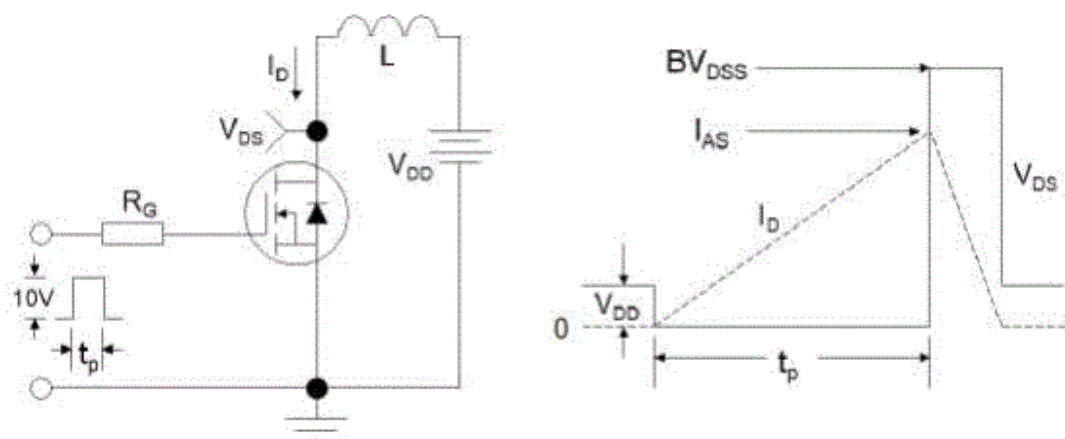


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

Typical Characteristics

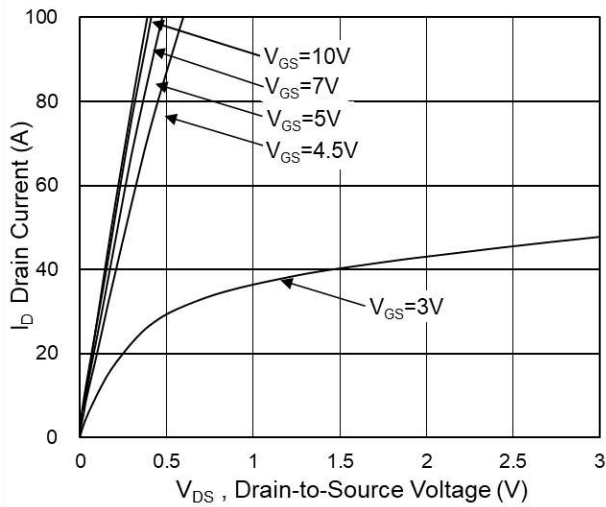


Fig.1 Typical Output Characteristics

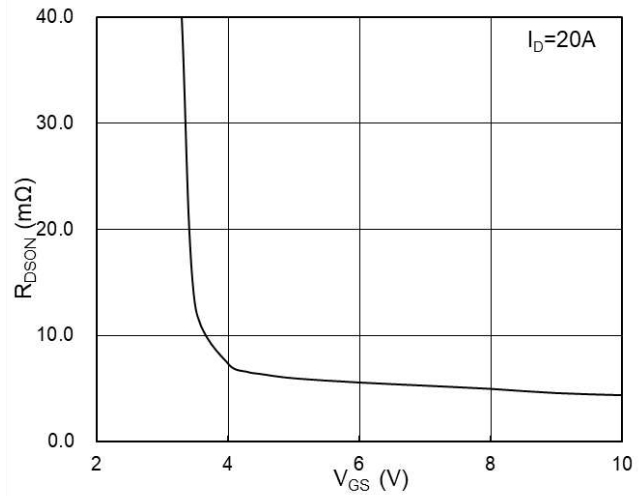


Fig.2 On-Resistance vs G-S Voltage

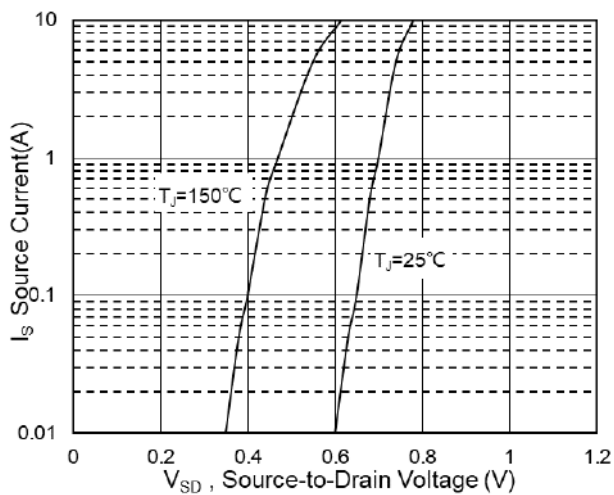


Fig.3 Source Drain Forward Characteristics

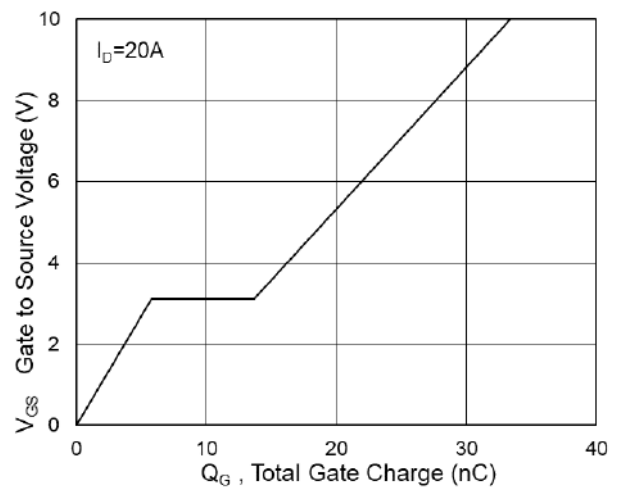


Fig.4 Gate-Charge Characteristics

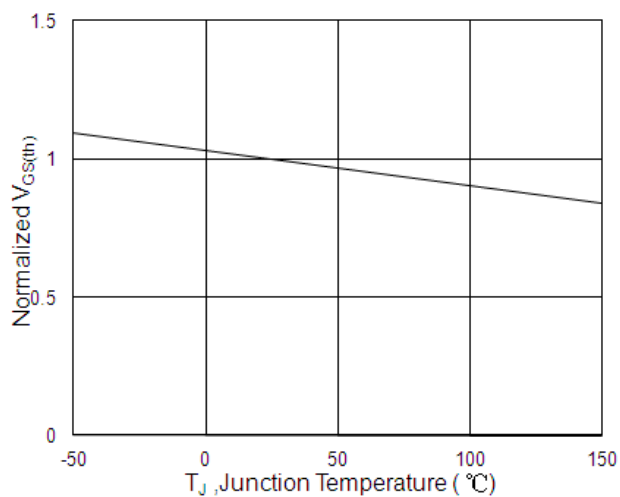


Fig.5 Normalized $V_{GS(th)}$ vs T_J

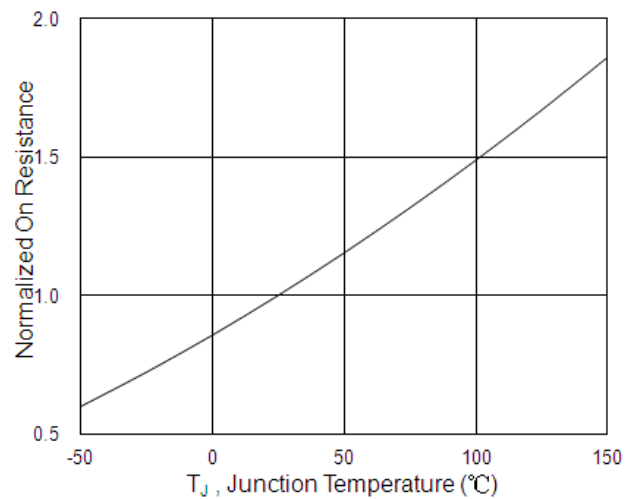
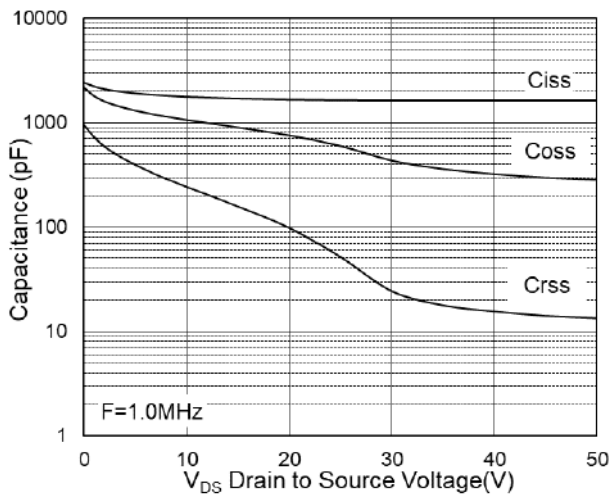
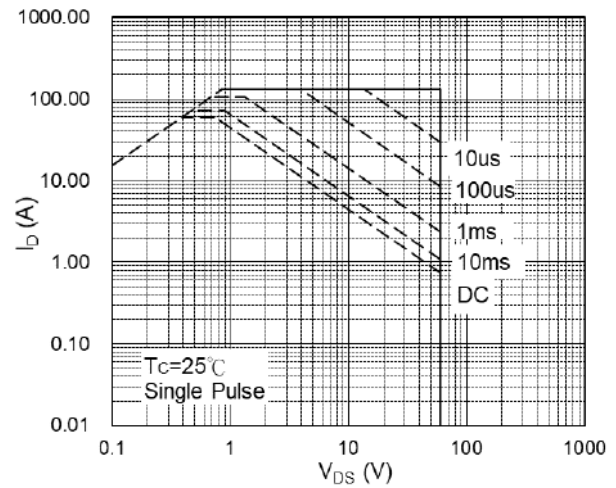
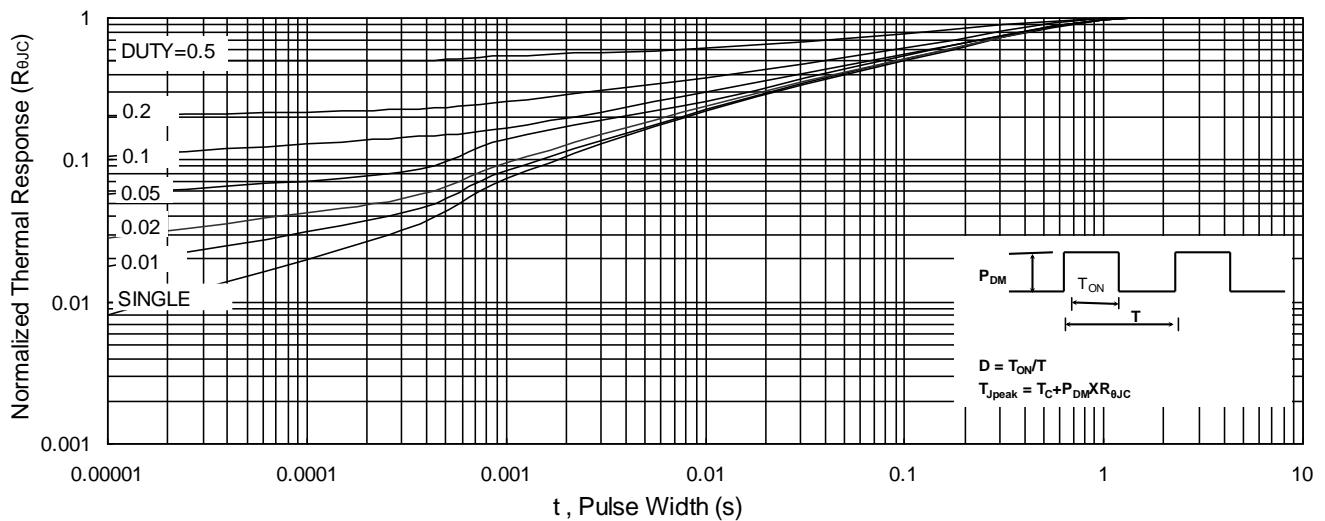
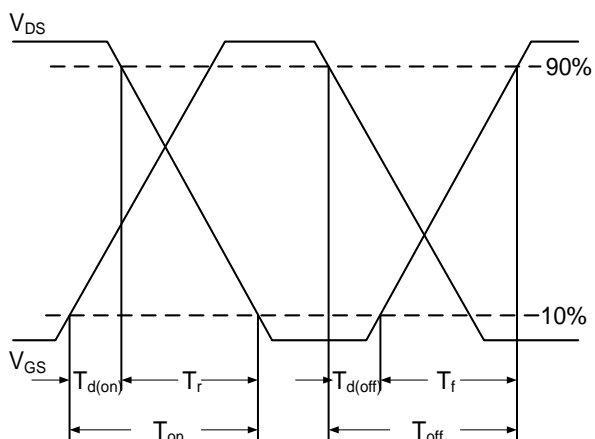
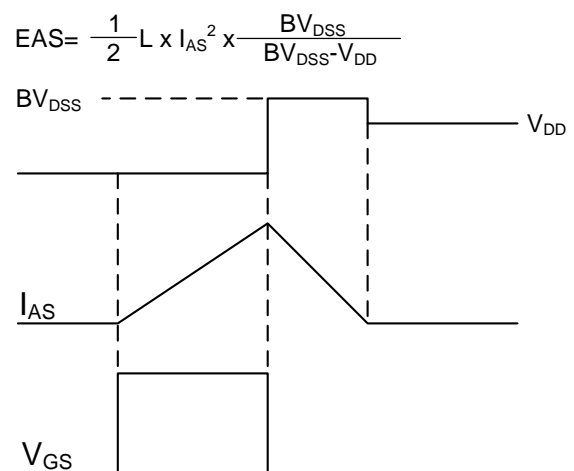
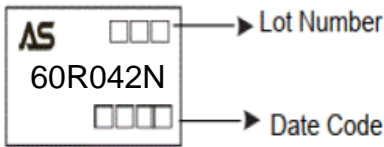


Fig.6 Normalized $R_{DS(on)}$ vs T_J

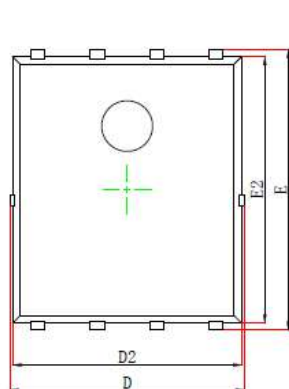

Fig.7 Capacitance

Fig.8 Safe Operating Area

Fig.9 Normalized Maximum Transient Thermal Impedance

Fig.10 Switching Time Waveform

Fig.11 Unclamped Inductive Switching Waveform

Ordering and Marking Information

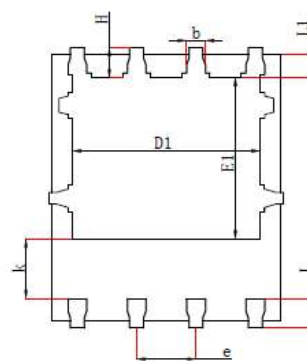
Ordering Device No.	Marking	Package	Packing	Quantity
ASDM60R042NQ-R	60R042N	DFN5x6-8	Tape&Reel	4000/Reel

PACKAGE	MARKING
DFN5x6-8	 <p>AS □□□□ → Lot Number</p> <p>60R042N</p> <p>□□□□ → Date Code</p>

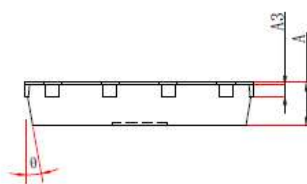
Dimensions(DFN5×6-8)



Top View
[顶视图]



Bottom View
[背视图]



Side View
[侧视图]

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.254REF.		0.010REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	3.910	4.110	0.154	0.162
E1	3.375	3.575	0.133	0.141
D2	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

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