Alfa-MOS Technology

AFN9634WS
60V N-Channel Enhancement Mode MOSFET

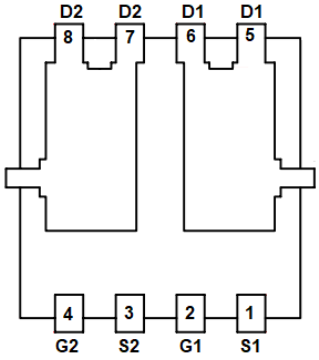
General Description

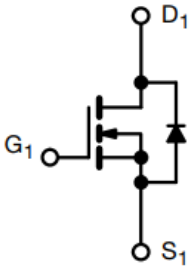
AFN9634WS, N-Channel enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.
These devices are particularly suited for low voltage power management, such as smart phone and notebook computer and other battery powered circuits, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

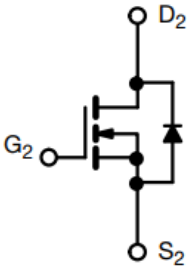
- 60V/6.0A,$R_{DS(ON)}$= 25mΩ@V_{GS}=10V
- 60V/5.4A,$R_{DS(ON)}$= 35mΩ@V_{GS}=4.5V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- ESD Protection
- DFN3.3X3.3-8L package design

Pin Description (DFN3.3X3.3-8L)

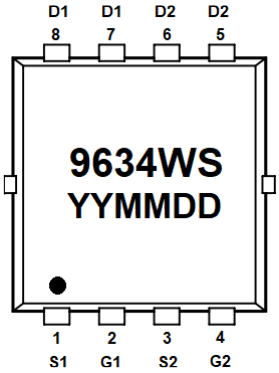




N-Channel MOSFET



N-Channel MOSFET



Application

- DC/DC Conversion
- Load Switch

Pin Define

Pin	Symbol	Description
1	S1	Source 1
2	G1	Gate 1
3	S2	Source 2
4	G2	Gate 2
5 / 6	D2	Drain 2
7 / 8	D1	Drain 1

Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFN9634WSFN308RG	9634WS	DFN3.3X3.3-8L	Tape & Reel	5000 EA

※ YY year code
※ MM month code
※ DD date code
※ AFN9634WSFN308RG : 13” Tape & Reel ; Pb- Free ; Halogen –Free

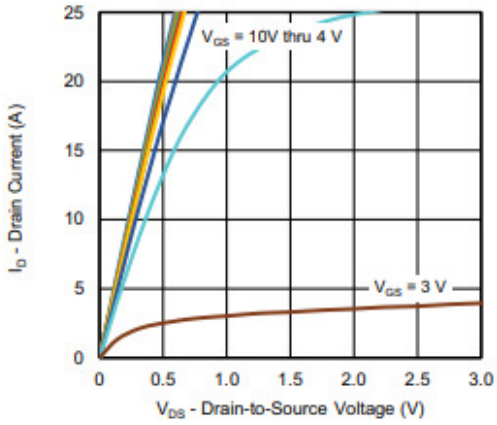
Absolute Maximum Ratings (T_A=25℃ Unless otherwise noted)

Parameter		Symbol	Typical	Unit
Drain-Source Voltage		V_{DSS}	60	V
Gate –Source Voltage		V_{GSS}	±20	V
Continuous Drain Current(TJ=150℃)	T_C=25℃	I_D	6	A
	T_C=70℃		6	
	T_A=25℃		6	
	T_A=70℃		5.4	
Pulsed Drain Current		I_{DM}	24	A
Continuous Source Current(Diode Conduction)	T_C=25℃	I_S	6	A
	T_A=70℃		2.1	
Single pulse avalanche current	L=0.1mH	I_{AS}	10	
Single pulse avalanche energy		E_{AS}	5	mJ
Power Dissipation	T_C=25℃	P_D	18	W
	T_C=70℃		10	
	T_A=25℃		2.5	
	T_A=70℃		1.5	
Operating junction and storage temperature range		T_J , T_{STG}	-55/150	℃
Soldering recommendations (peak temperature)			260	
Thermal Resistance-Junction to Ambient		$R_{\theta JA}$	38	℃/W
Maximum junction-to-case (drain)		$R_{\theta JC}$	5.6	

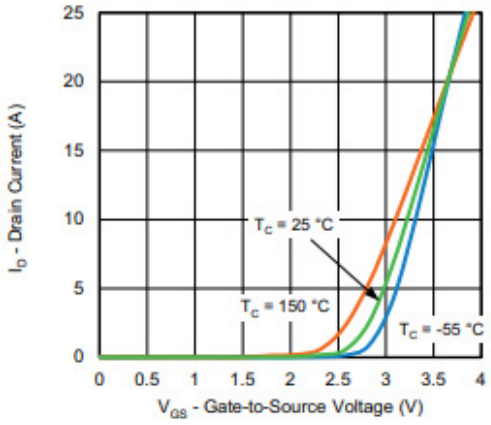
Electrical Characteristics (T_A=25℃ Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250uA	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250uA	1.0		2.5	
Gate Leakage Current	I_{GSS}	V_{DS}=0V,V_{GS}=±20V			±10	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=48V,V_{GS}=0V			1	uA
		V_{DS}=48V,V_{GS}=0V T_J=85℃			10	
On-State Drain Current	$I_{D(on)}$	V_{DS}≧5V,V_{GS}=10V	8			A
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=6.0A		20	25	mΩ
		V_{GS}=4.5V,I_D=5.4A		28	35	
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=10A		23		S
Diode Forward Voltage	V_{SD}	I_S=2A,V_{GS}=0V		0.75	1.2	V
Dynamic						
Total Gate Charge	Q_g	V_{DS}=30V,V_{GS}=4.5V I_D≡5A		3.3	5	nC
Gate-Source Charge	Q_{gs}			1.7		
Gate-Drain Charge	Q_{gd}			0.9		
Input Capacitance	C_{iss}	V_{DS}=30V,V_{GS}=0V f=1MHz		420		pF
Output Capacitance	C_{oss}			90		
Reverse Transfer Capacitance	C_{rss}			5		
Turn-On Time	$t_{d(on)}$	V_{DD}=30V,R_L=6Ω I_D≡5A,V_{GEN}=10V R_G=1Ω		10	20	ns
	t_r			5	10	
Turn-Off Time	$t_{d(off)}$			15	30	
	t_f			5	10	

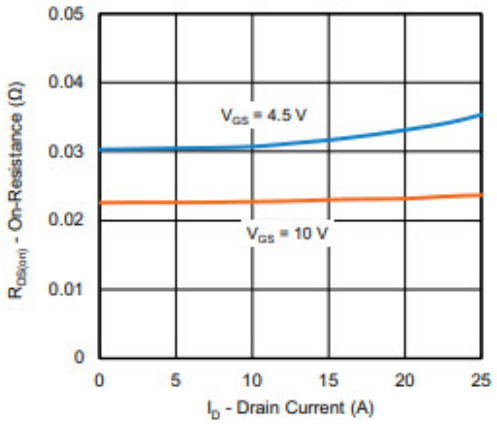
Typical Characteristics



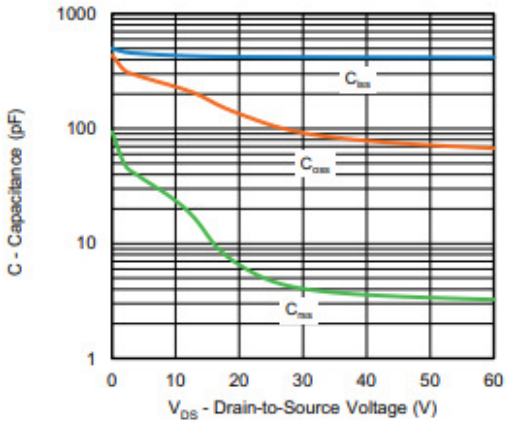
Output Characteristics



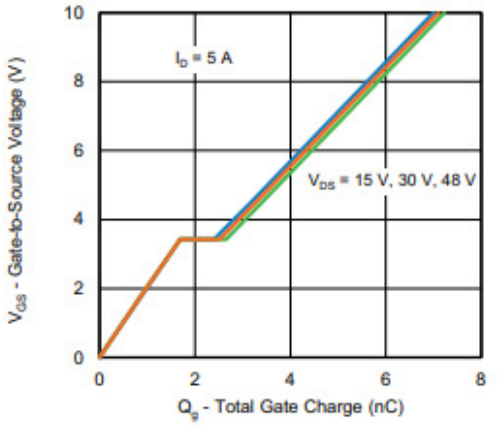
Transfer Characteristics



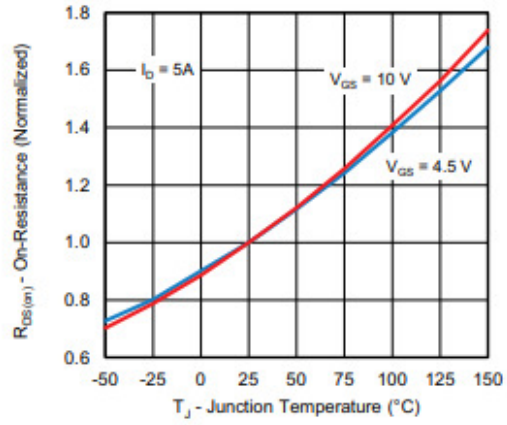
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

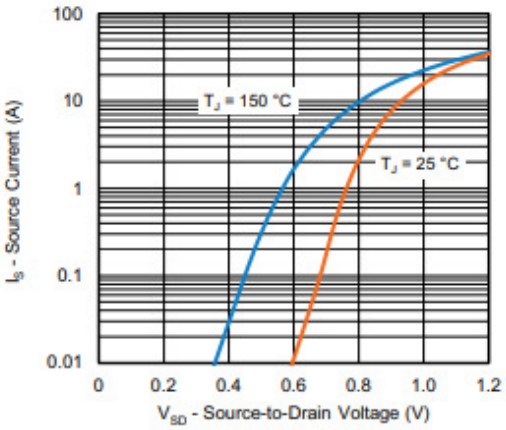


Gate Charge

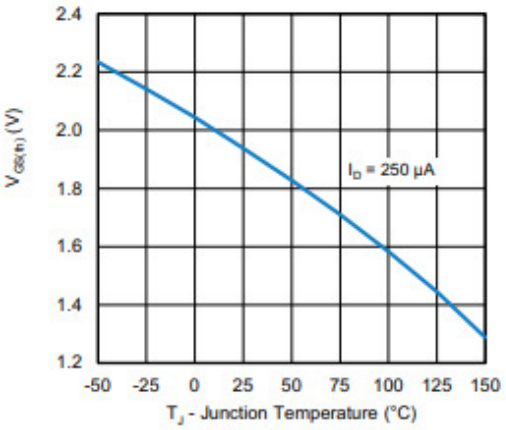


On-Resistance vs. Junction Temperature

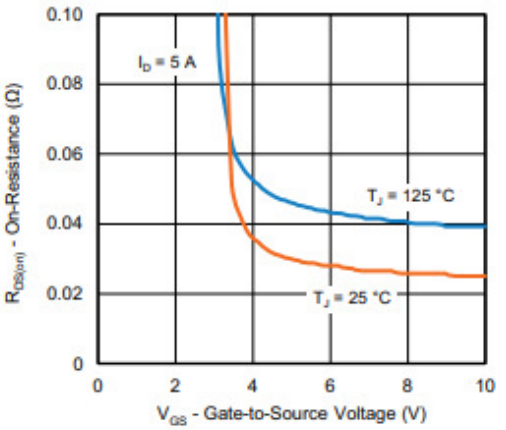
Typical Characteristics



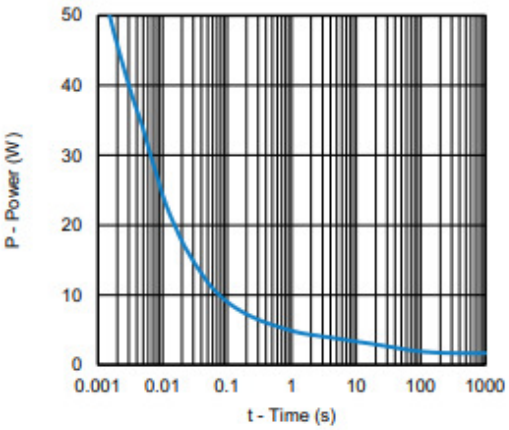
Source-Drain Diode Forward Voltage



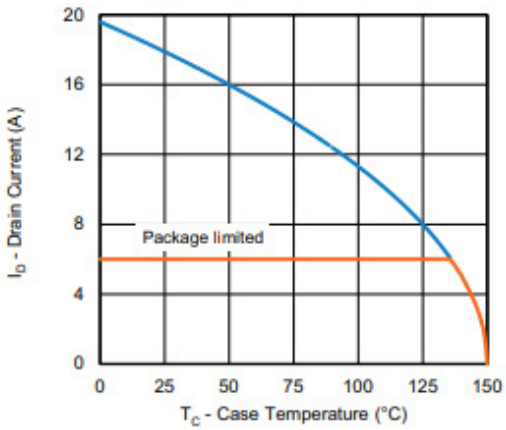
Threshold Voltage



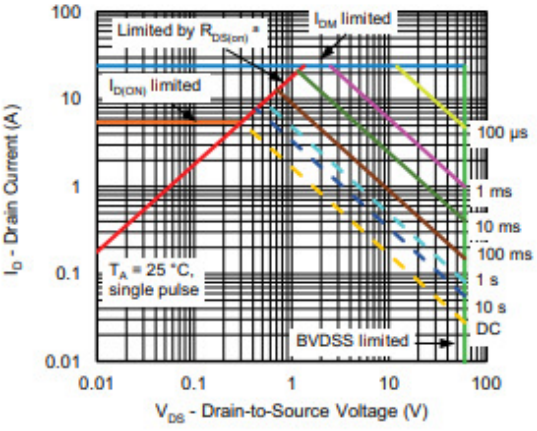
On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Ambient

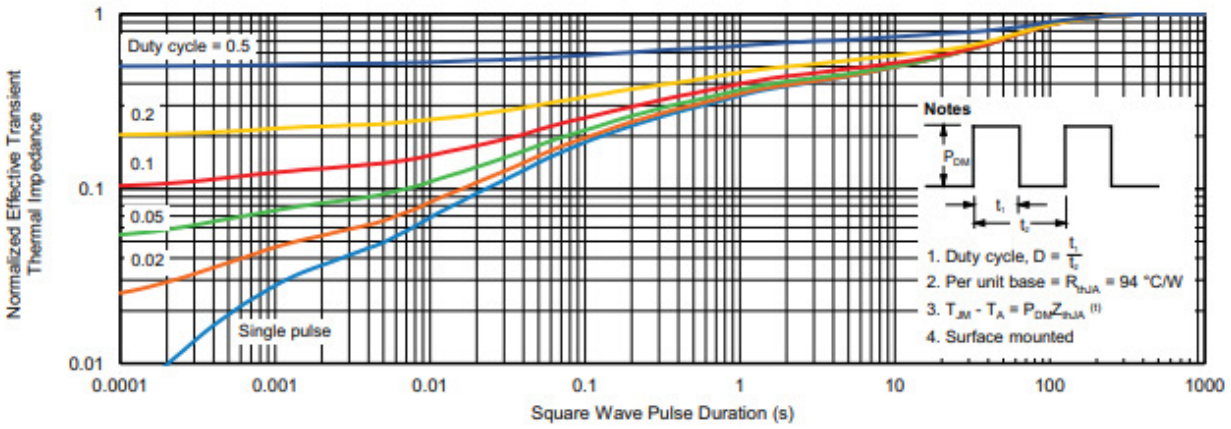


Current Derating [a]

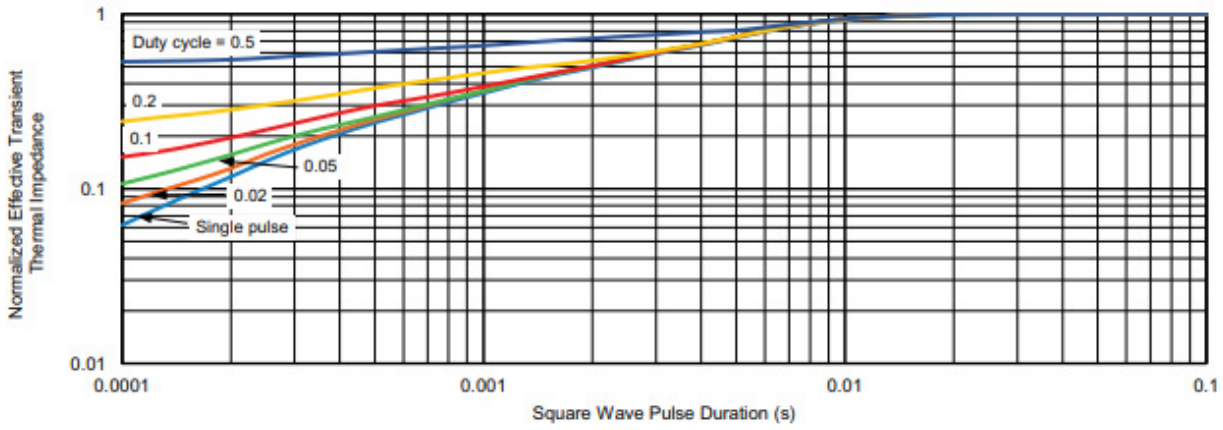


Safe Operating Area, Junction-to-Ambient

Typical Characteristics



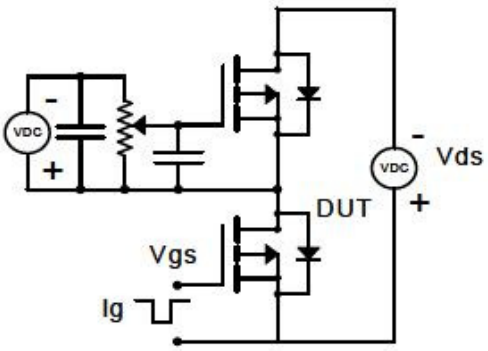
Normalized Thermal Transient Impedance, Junction-to-Ambient

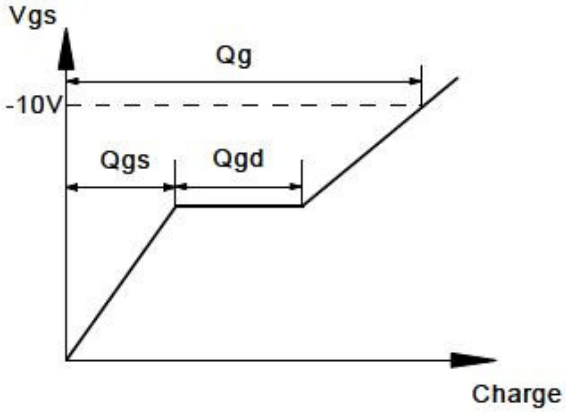


Normalized Thermal Transient Impedance, Junction-to-Case

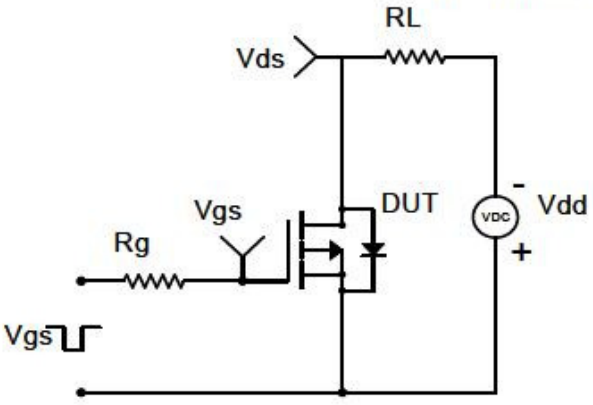
Typical Characteristics

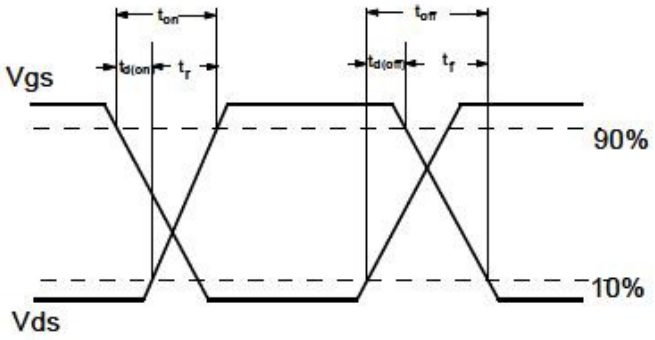
Gate Charge Test Circuit & Waveform



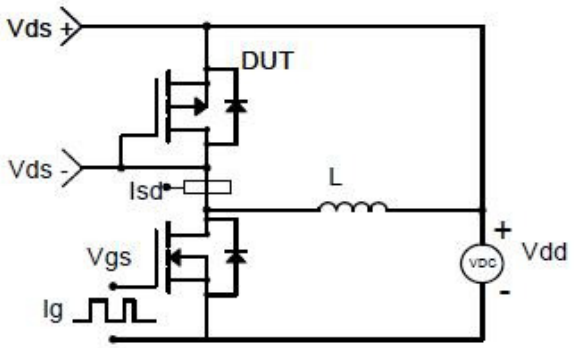


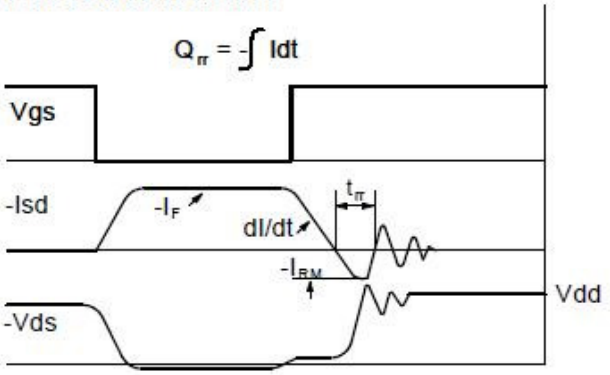
Resistive Switching Test Circuit & Waveforms



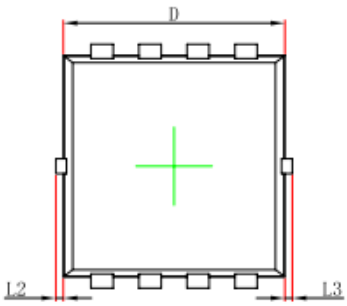


Diode Recovery Test Circuit & Waveforms

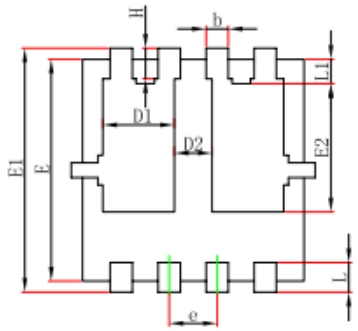




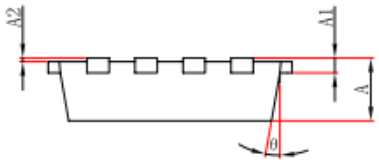
Package Information (DFN3.3X3.3-8L)



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.650	0.850	0.026	0.033
A1	0.152 REF.		0.006 REF.	
A2	0~0.05		0~0.002	
D	2.900	3.100	0.114	0.122
D1	0.935	1.135	0.037	0.045
D2	0.280	0.480	0.011	0.019
E	2.900	3.100	0.114	0.122
E1	3.150	3.450	0.124	0.136
E2	1.535	1.935	0.060	0.076
b	0.200	0.400	0.008	0.016
e	0.550	0.750	0.022	0.030
L	0.300	0.500	0.012	0.020
L1	0.180	0.480	0.007	0.019
L2	0~0.100		0~0.004	
L3	0~0.100		0~0.004	
H	0.315	0.515	0.012	0.020
θ	9°	13°	9°	13°

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