



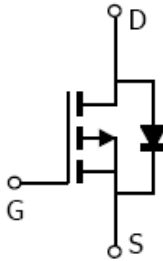
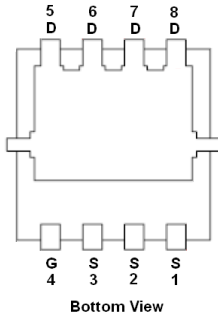
## General Description

AFP7117WS, P-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

- -150V/-1.4A,  $R_{DS(ON)}=750\text{ m}\Omega@V_{GS}=-10\text{V}$
- -150V/-1.0A,  $R_{DS(ON)}=800\text{ m}\Omega@V_{GS}=-6\text{V}$
- Super high density cell design for extremely low  $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- DFN3.3X3.3-8L package design

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



## Application

- DC-DC Converter
- POL

## Pin Define

Pin	Symbol	Description
1	S	Source
2	S	Source
3	S	Source
4	G	Gate
5	D	Drain
6	D	Drain
7	D	Drain
8	D	Drain

## Ordering Information

Part Ordering No.	Part Marking	Package	Unit	Quantity
AFP7117WSFN308RG	7117WS	DFN3.3X3.3-8L	Tape & Reel	5000 EA

※ YY year code

※ MM month code

※ DD date code

※ AFP7117WSFN308RG : 13" Tape & Reel ; Pb- Free ; Halogen -Free



### Absolute Maximum Ratings (T<sub>A</sub>=25°C Unless otherwise noted)

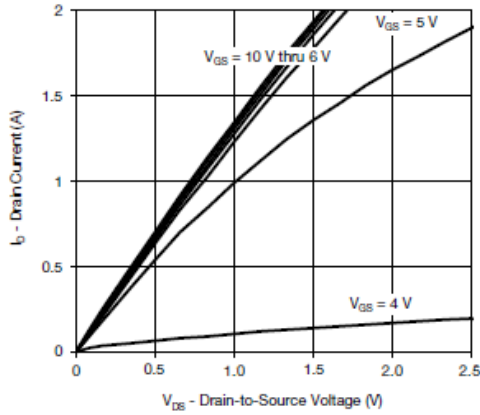
Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	-150	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (T <sub>J</sub> =150°C)	I <sub>D</sub>	T <sub>C</sub> =25°C T <sub>C</sub> =70°C	-3.0 -2.4
		T <sub>A</sub> =25°C T <sub>A</sub> =70°C	-1.4 -1.0
Pulsed Drain Current	I <sub>DM</sub>	-3.2	A
Single pulse avalanche energy	E <sub>AS</sub>	0.5	mJ
Continuous Source Current (Diode Conduction)	I <sub>S</sub>	L=1.0 mH	-10 -2.7
		T <sub>C</sub> =25°C T <sub>A</sub> =25°C	-10 -2.7
Power Dissipation	P <sub>D</sub>	T <sub>C</sub> =25°C T <sub>C</sub> =70°C	28 15
		T <sub>A</sub> =25°C T <sub>A</sub> =70°C	3.1 2.0
Operating Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature Range	T <sub>STG</sub>	-55/150	°C
Thermal Resistance Junction-to-Case (Drain)	R <sub>θJC</sub>	5	°C/W
Thermal Resistance-Junction to Ambient	R <sub>θJA</sub>	40	

### Electrical Characteristics (T<sub>A</sub>=25°C Unless otherwise noted)

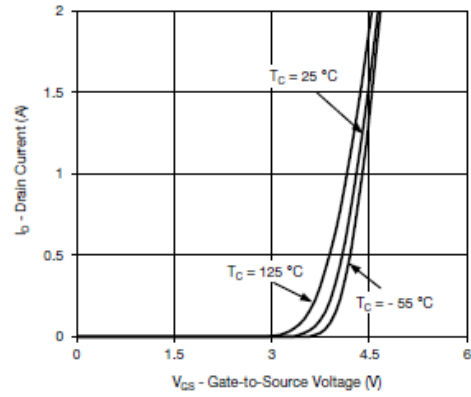
Parameter	Symbol	Conditions	Min.	Typ	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA	-150			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA	-2.0	-2.9	-4.0	
Gate Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =-120V, V <sub>GS</sub> =0V			-1	uA
		V <sub>DS</sub> =-120V, V <sub>GS</sub> =0V T <sub>J</sub> =85°C			-30	
On-State Drain Current	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ -15V, V <sub>GS</sub> =-10V	-1.6			A
Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =-10V, I <sub>D</sub> =-1.4A		665	750	mΩ
		V <sub>GS</sub> =-6V, I <sub>D</sub> =-1.0A		715	800	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =-15V, I <sub>D</sub> =-0.5A		3		S
Diode Forward Voltage	V <sub>SD</sub>	I <sub>S</sub> =-1.0A, V <sub>GS</sub> =0V		-0.75	-1.2	V
<b>Dynamic</b>						
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> =-75V, V <sub>GS</sub> =-10V I <sub>D</sub> ≡-1.1A		7.0	12	nC
Gate-Source Charge	Q <sub>gs</sub>			1.8		
Gate-Drain Charge	Q <sub>gd</sub>			2.2		
Gate Resistance	R <sub>g</sub>	f=1MHz		12	15	Ω
Pulse Diode Forward Current	I <sub>SM</sub>				-12	A
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> =-75V, V <sub>GS</sub> =0V f=1MHz		280	500	pF
Output Capacitance	C <sub>oss</sub>			20	45	
Reverse Transfer Capacitance	C <sub>rss</sub>			15	25	
Turn-On Time	t <sub>d(on)</sub>	V <sub>DD</sub> =-75V, R <sub>L</sub> =85Ω I <sub>D</sub> ≡-1.0A, V <sub>GEN</sub> =-10V R <sub>G</sub> =1.0Ω		10	20	ns
	t <sub>r</sub>			15	30	
Turn-Off Time	t <sub>d(off)</sub>			15	30	
	t <sub>f</sub>			10	25	
Body Diode Reverse Recovery Time	t <sub>rr</sub>		I <sub>F</sub> =-0.5 A, di/dt=100 A/μs,		50	
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>	T <sub>J</sub> = 25 °C		95	150	nC



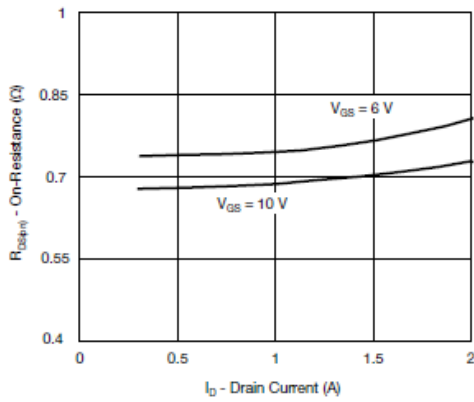
## Typical Characteristics



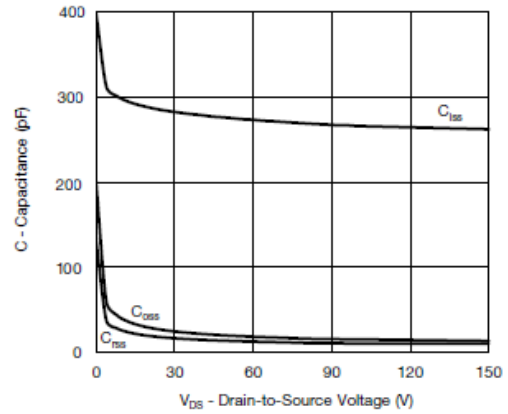
Output Characteristics



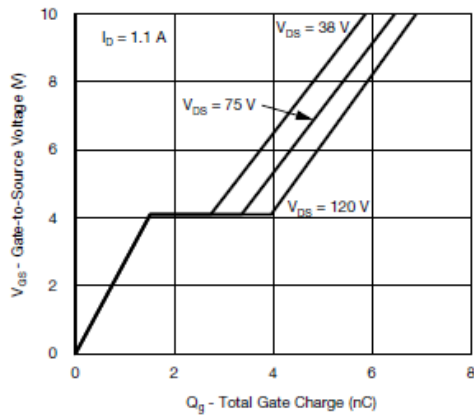
Transfer Characteristics



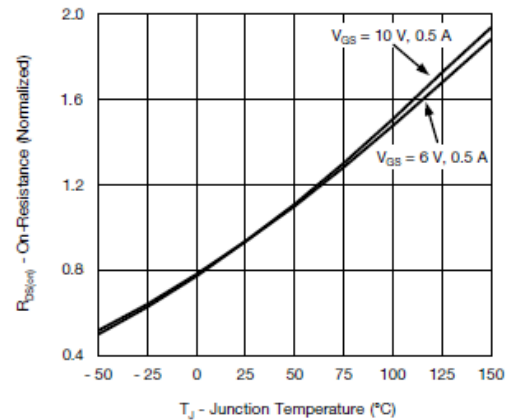
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



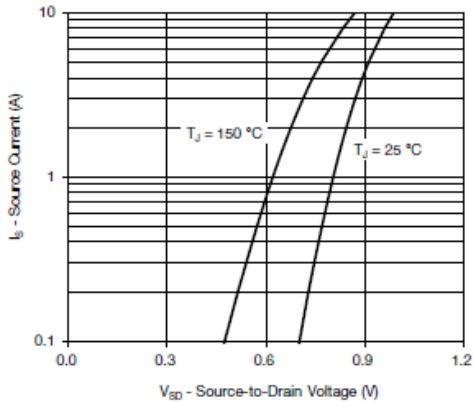
Gate Charge



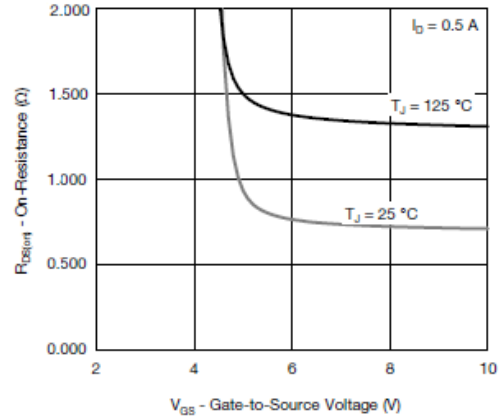
On-Resistance vs. Junction Temperature



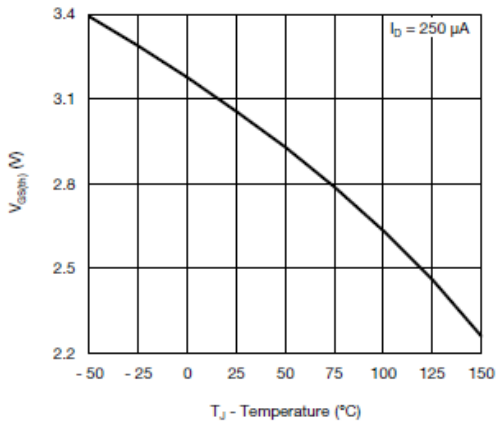
## Typical Characteristics



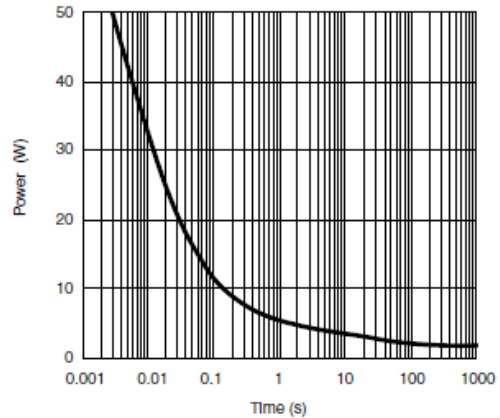
Source-Drain Diode Forward Voltage



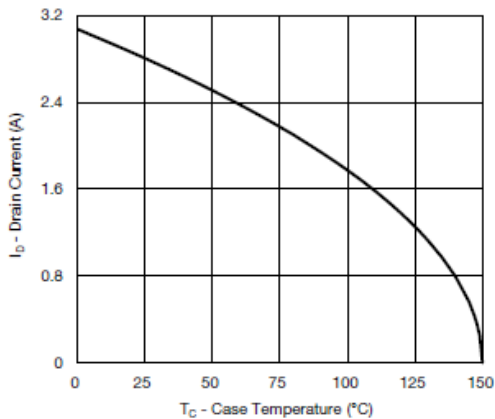
On-Resistance vs. Gate-to-Source Voltage



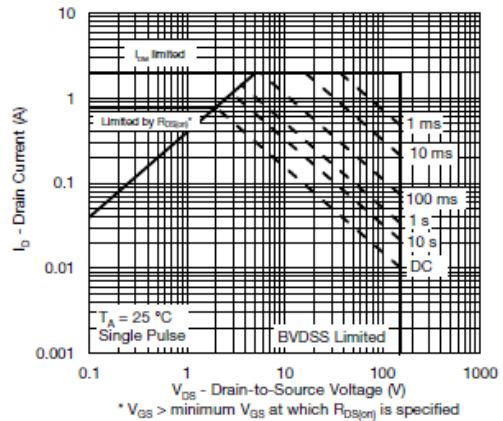
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



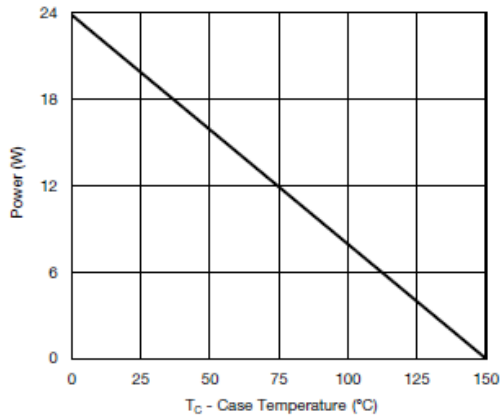
Max Current vs. Case Temperature



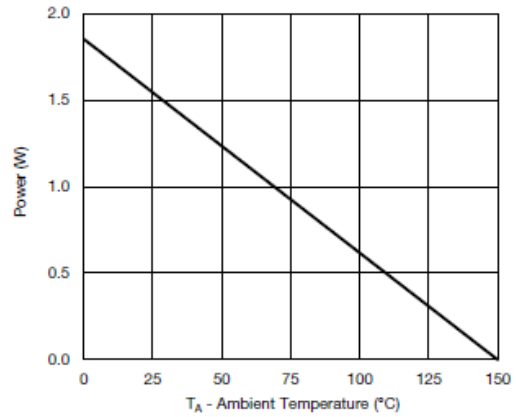
Safe Operating Area at  $T_A = 25^\circ\text{C}$



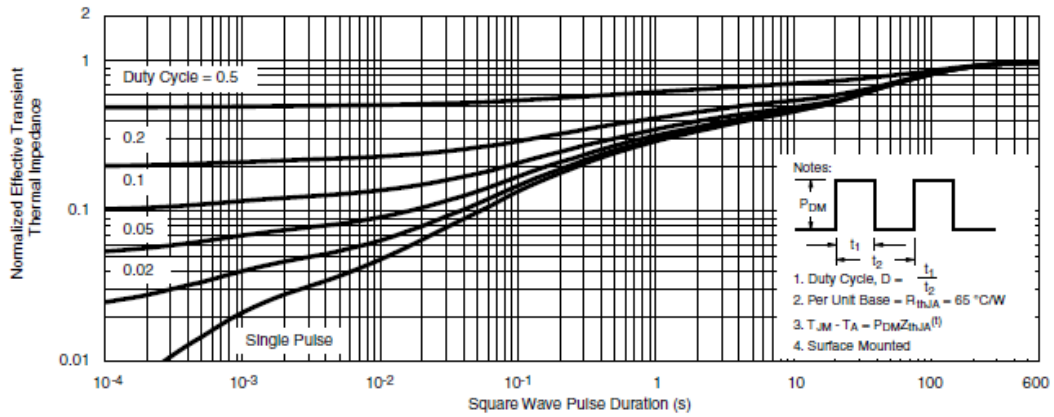
## Typical Characteristics



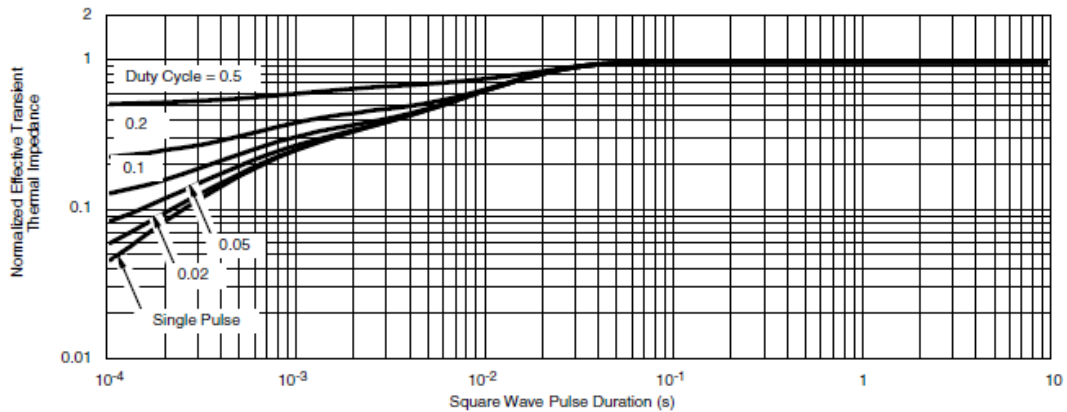
Power Junction-to-Case



Power Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient

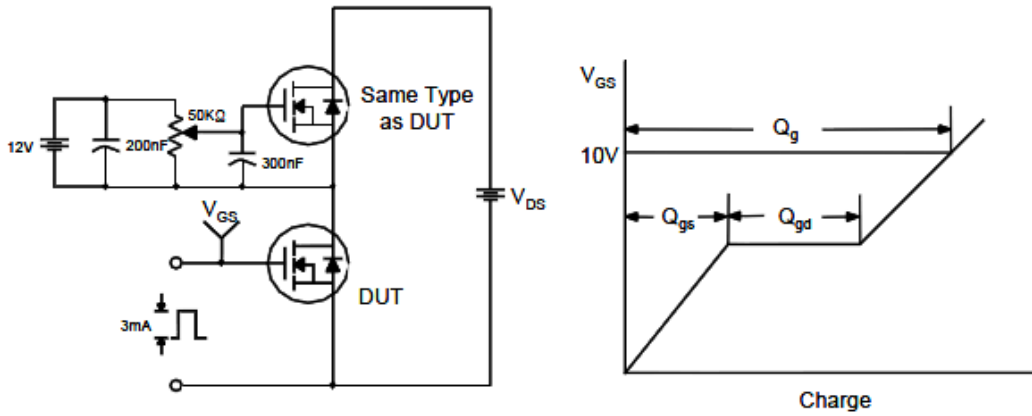


Normalized Thermal Transient Impedance, Junction-to-Case

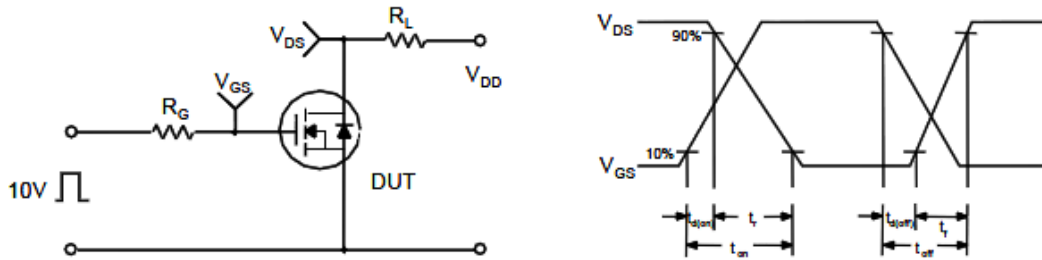


Typical Characteristics

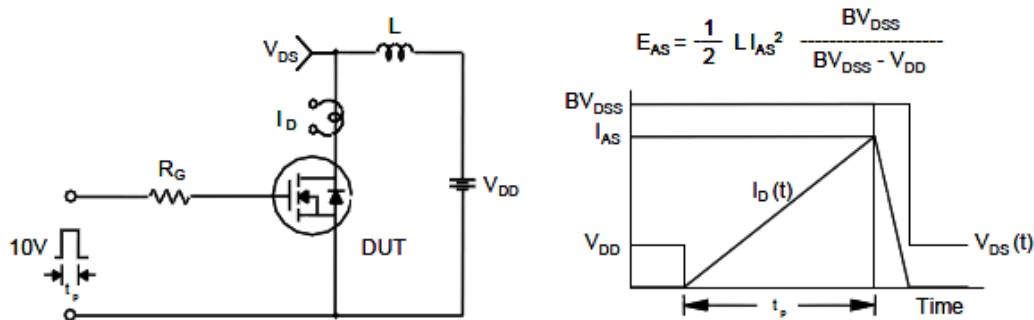
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

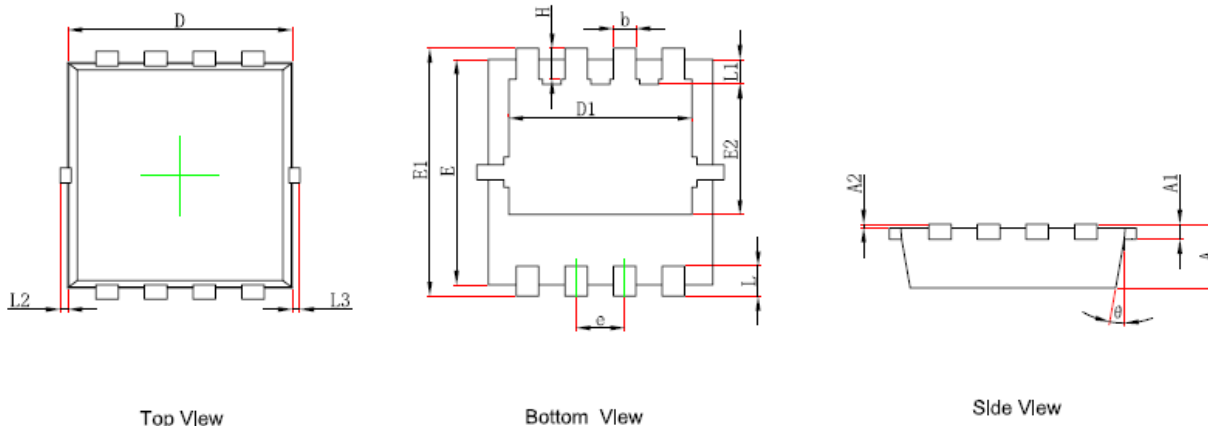


Unclamped Inductive Switching Test Circuit & Waveforms





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



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	2.300	2.600	0.091	0.102
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
$\theta$	9°	13°	9°	13°

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