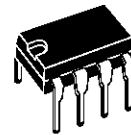


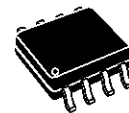
HIGH VOLTAGE HALF BRIDGE DRIVER WITH OSCILLATOR

PRELIMINARY DATA

- TECHNOLOGY: BCD "OFF-LINE"
- FLOATING SUPPLY VOLTAGE UP TO 600V
- GND REFERRED SUPPLY VOLTAGE UP TO 18V
- DRIVER CURRENT CAPABILITY:
 - SINK CURRENT = 270mA
 - SOURCE CURRENT = 170mA
- VERY LOW START UP CURRENT: 150 μ A
- VERY LOW OPERATING CURRENT: <2mA
- UNDERVOLTAGE LOCKOUT
- PROGRAMMABLE OSCILLATOR FREQUENCY
- dV/dt IMMUNITY UP TO ± 50 V/ns



Minidip



SO8

ORDERING NUMBERS:

 L6571A
 L6571B

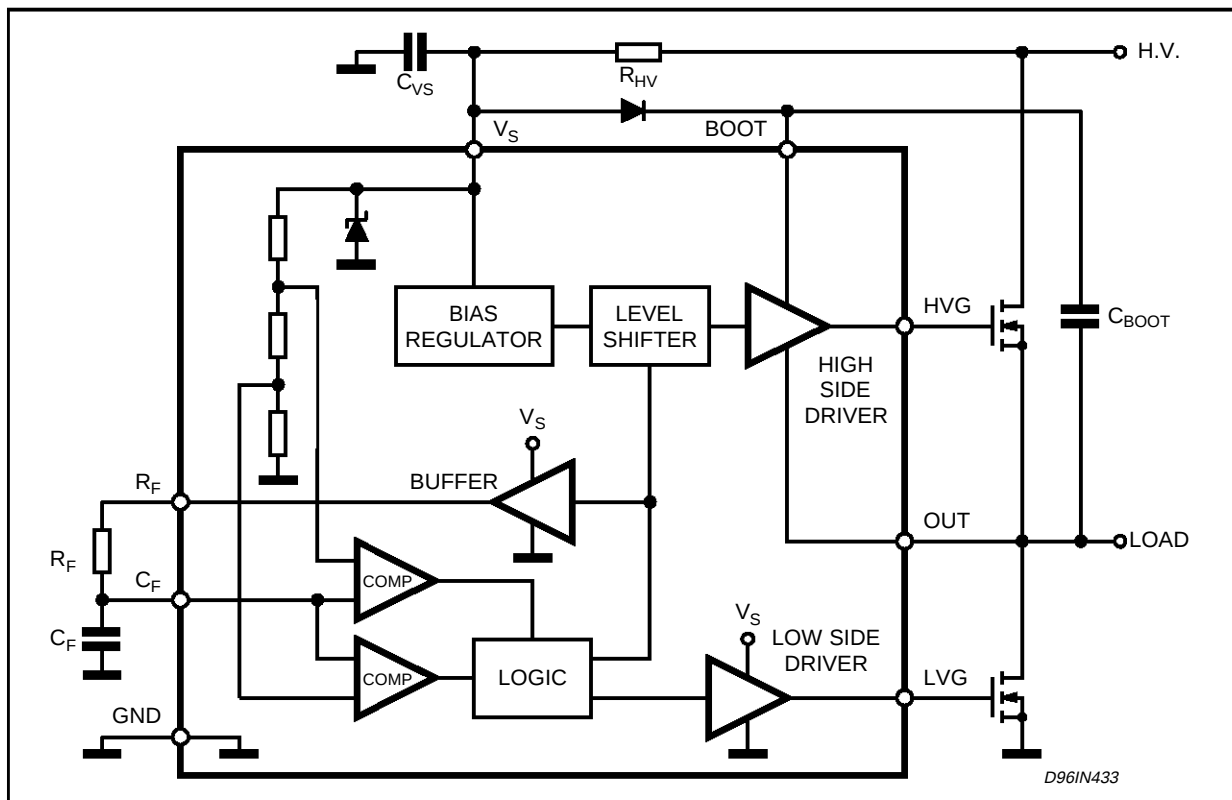
 L6571AD
 L6571BD

DESCRIPTION

The device is a high voltage half bridge driver with built-in oscillator. The frequency of the oscillator can be programmed using external resistor

and capacitor.

The output drivers are designed to drive external n-channel power MOSFET and IGBT. The internal logic assures a minimum dead time to avoid cross-conduction of the power devices.

BLOCK DIAGRAM


L6571A - L6571B

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
$I_S^{(*)}$	Supply Current	25	mA
V_{CF}	Oscillator Resistor Voltage	18	V
V_{LVG}	Low Side Switch Gate Output	14.6	V
V_{OUT}	High Side Switch Source Output	-1 to $V_{BOOT} - 18$	V
V_{HVG}	High Side Switch Gate Output	-1 to V_{BOOT}	V
V_{BOOT}	Floating Supply Voltage	618	V
$V_{BOOT/OUT}$	Floating Supply vs OUT Voltage	18	V
dV_{BOOT}/dt	V_{BOOT} Slew Rate (Repetitive)	± 50	V/ns
dV_{OUT}/dt	V_{OUT} Slew Rate (Repetitive)	± 50	V/ns
T_{stg}	Storage Temperature	-40 to 150	°C
T_j	Junction Temperature	-40 to 150	°C
T_{amb}	Ambient Temperature (Operative)	-40 to 125	°C

(*) The device has an internal zener clamp between GND and V_S (typical 15.6V).
Therefore the circuit should not be driven by a DC low impedance power source.

Note: ESD immunity for pins 6, 7 and 8 is guaranteed up to 900 V (Human Body Model)

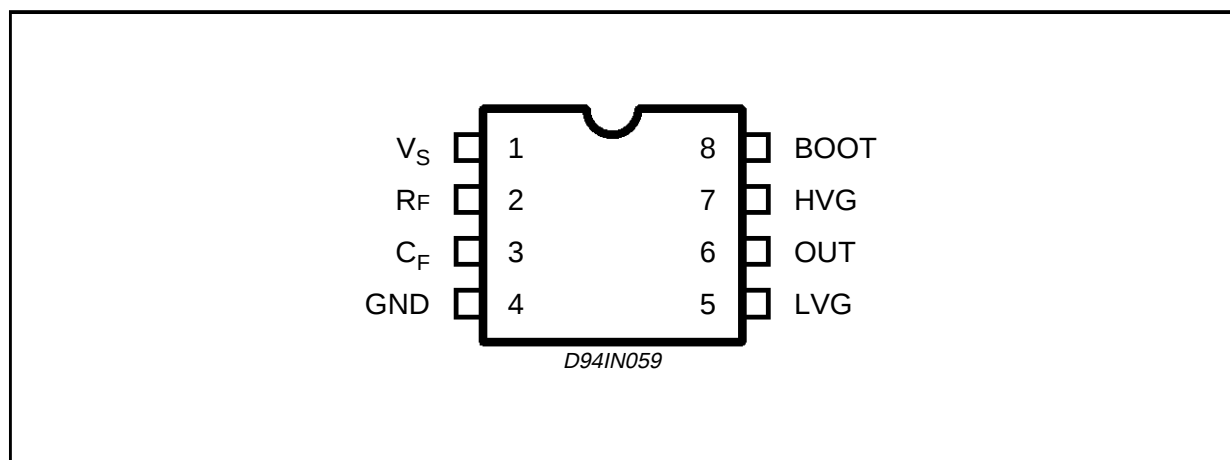
THERMAL DATA

Symbol	Parameter	Minidip	SO8	Unit
$R_{th\ j-amb}$	Thermal Resistance Junction-Ambient	Max 100	150	°C/W

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter	Min.	Max.	Unit
V_S	Supply Voltage	10	V_{CL}	V
V_{BOOT}	Floating Supply Voltage	-	500	V
V_{OUT}	High Side Switch Source Output	-1	$V_{BOOT} - V_{CL}$	V
f_{out}	Oscillation Frequency		200	kHz

PIN CONNECTION



ELECTRICAL CHARACTERISTICS ($V_S = 12V$; $V_{BOOT} - V_{OUT} = 12V$; $T_j = 25^\circ C$; unless otherwise specified.)

Symbol	Pin	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_{SUVP}	1	V_S Turn On Threshold		8.3	9	9.7	V
V_{SUVN}		V_S Turn Off Threshold		7.3	8	8.7	V
$V_{SU VH}$		V_S Hysteresis		0.7	1	1.3	V
V_{CL}		V_S Clamping Voltage	$I_S = 5mA$	14.6	15.6	16.6	V
I_{SU}		Start Up Current	$V_S < V_{SUVN}$		150	250	μA
I_q		Quiescent Current	$V_S > V_{SUVP}$		500	700	μA
I_{BOOTLK}	8	Leakage Current BOOT pin vs GND	$V_{BOOT} = 580V$			5	μA
I_{OUTLK}	6	Leakage Current OUT pin vs GND	$V_{OUT} = 562V$			5	μA
$I_{HVG SO}$	7	High Side Driver Source Current	$V_{HVG} = 6V$	110	175		mA
$I_{HVG SI}$		High Side Driver Sink Current	$V_{HVG} = 6V$	190	275		mA
$I_{LVG SO}$	5	Low Side Driver Source Current	$V_{LVG} = 6V$	110	175		mA
$I_{LVG SI}$		Low Side Driver Sink Current	$V_{LVG} = 6V$	190	275		mA
$V_{RF ON}$	2	RF High Level Output Voltage	$I_{RF} = 1mA$	$V_S - 0.05$		$V_S - 0.2$	V
$V_{RF OFF}$		RF Low Level Output Voltage	$I_{RF} = -1mA$	50		200	mV
V_{CFU}	3	CF Upper Threshold		7.7	7.95	8.2	V
V_{CFL}		CF Lower Threshold		3.80	4.05	4.3	V
t_d		Internal Dead Time	L6571A L6571B	0.85 0.50	1.25 0.72	1.65 0.94	μs μs
D_C		Duty Cycle, Ratio Between Dead Time + Conduction Time of High Side and Low Side Drivers		0.45	0.5	0.55	
I_{AVE}	1	Average Current from V_S	No Load, $f_s = 60KHz$		1.2	1.5	mA
f_{out}	6	Oscillation Frequency	$R_T = 12k$ $C_T = 1nF$	57	60	63	kHz

OSCILLATOR FREQUENCY

The frequency of the internal oscillator can be programmed using external resistor and capacitor. The nominal oscillator frequency can be calculated using the following equation:

$$f_{osc} = \frac{1}{2 \cdot R_F \cdot C_F \cdot \ln 2} = \frac{1}{1.3863 \cdot R_F \cdot C_F}$$

where R_F and C_F are the external resistor and capacitor

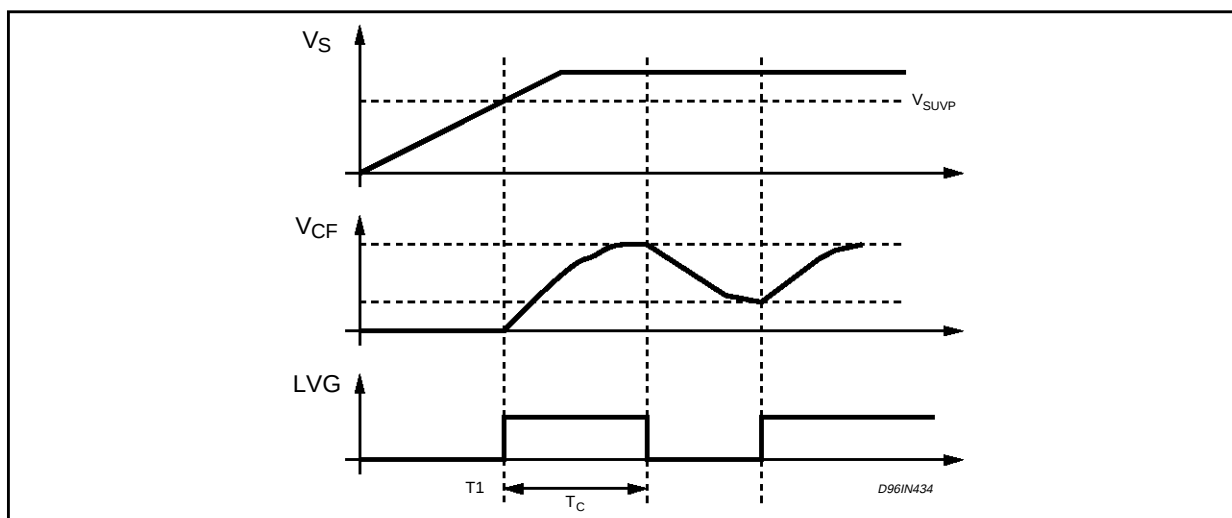
Figure 2: WAVEFORMS

Figure 3: Typical Dead Time vs. Temperature Dependency (L6571A).

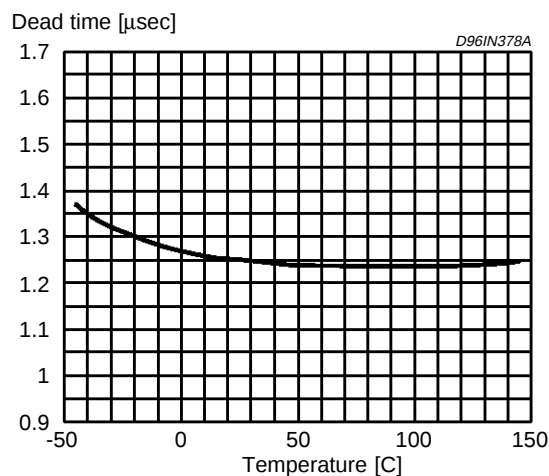


Figure 4: Typical Frequency vs Temperature Dependency

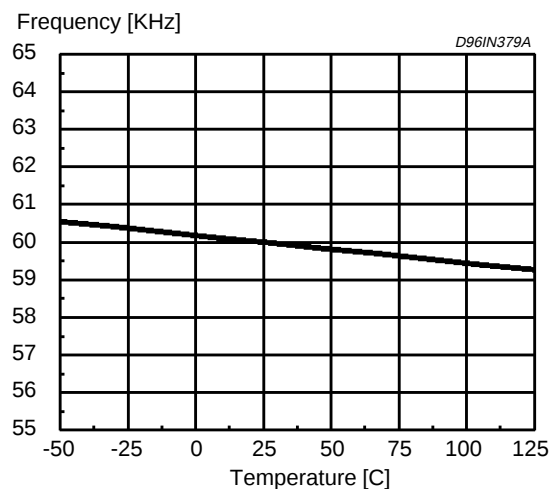


Figure 5: Typical and Theoretical Oscillator Frequency vs Resistor Value

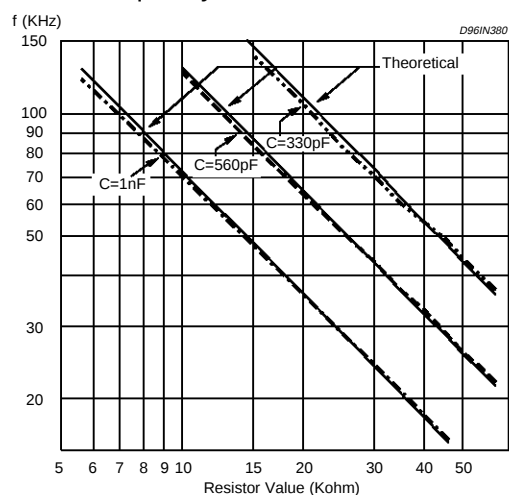


Figure 8: Typical Rise and Fall Times vs. Load Capacitance

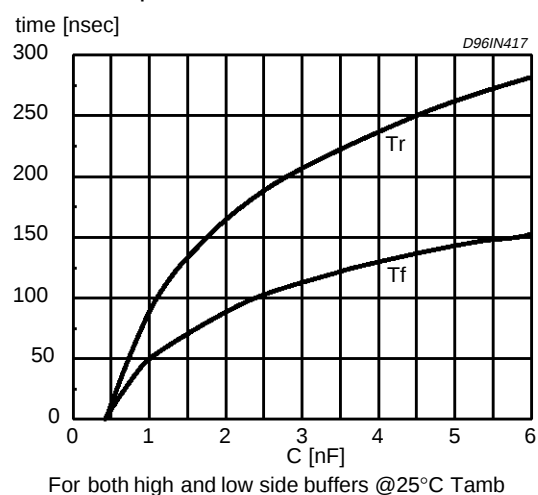
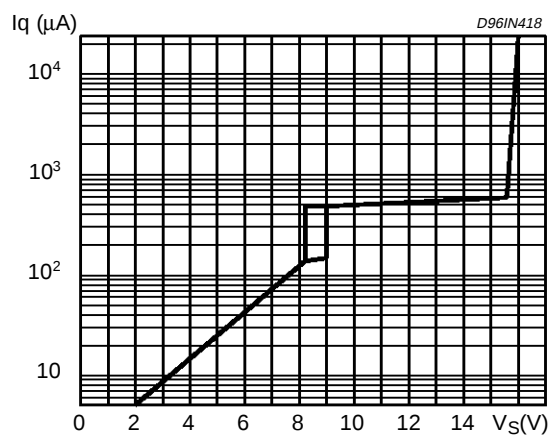
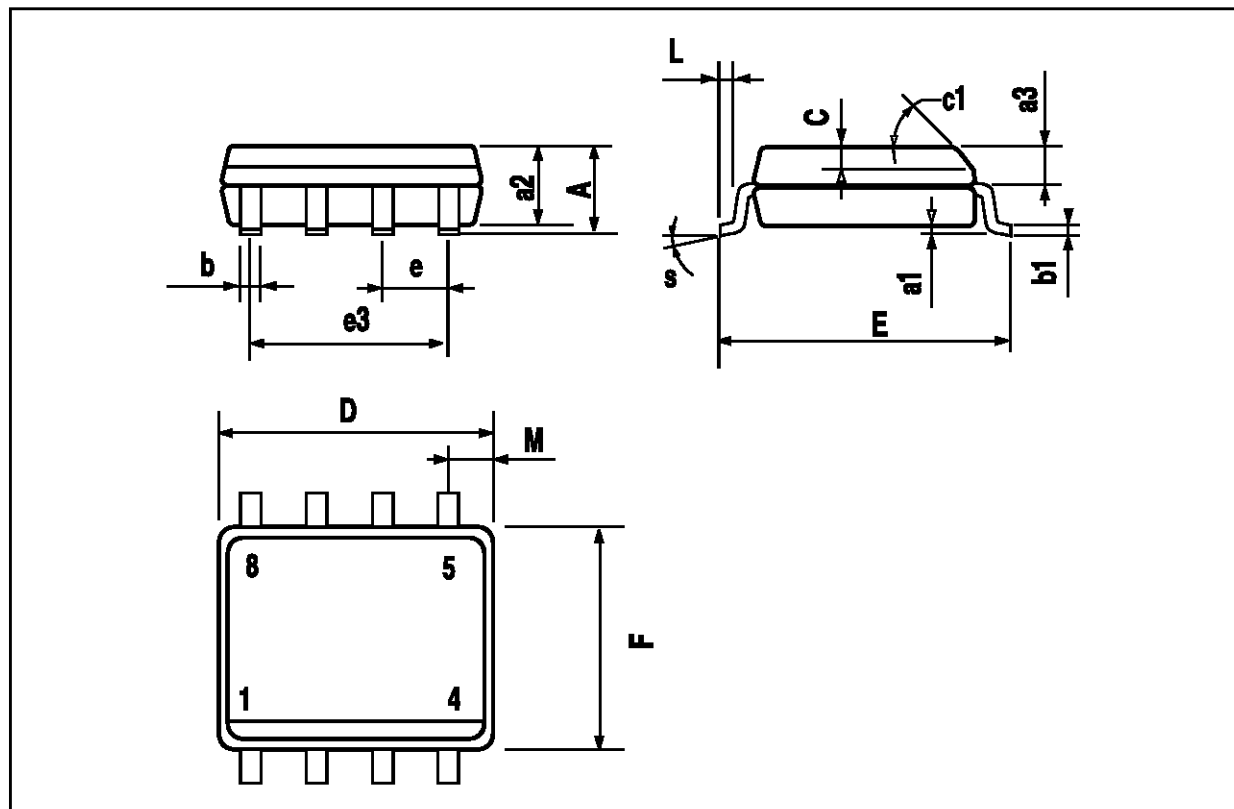


Figure 9: Quiescent Current vs. Supply Voltage.



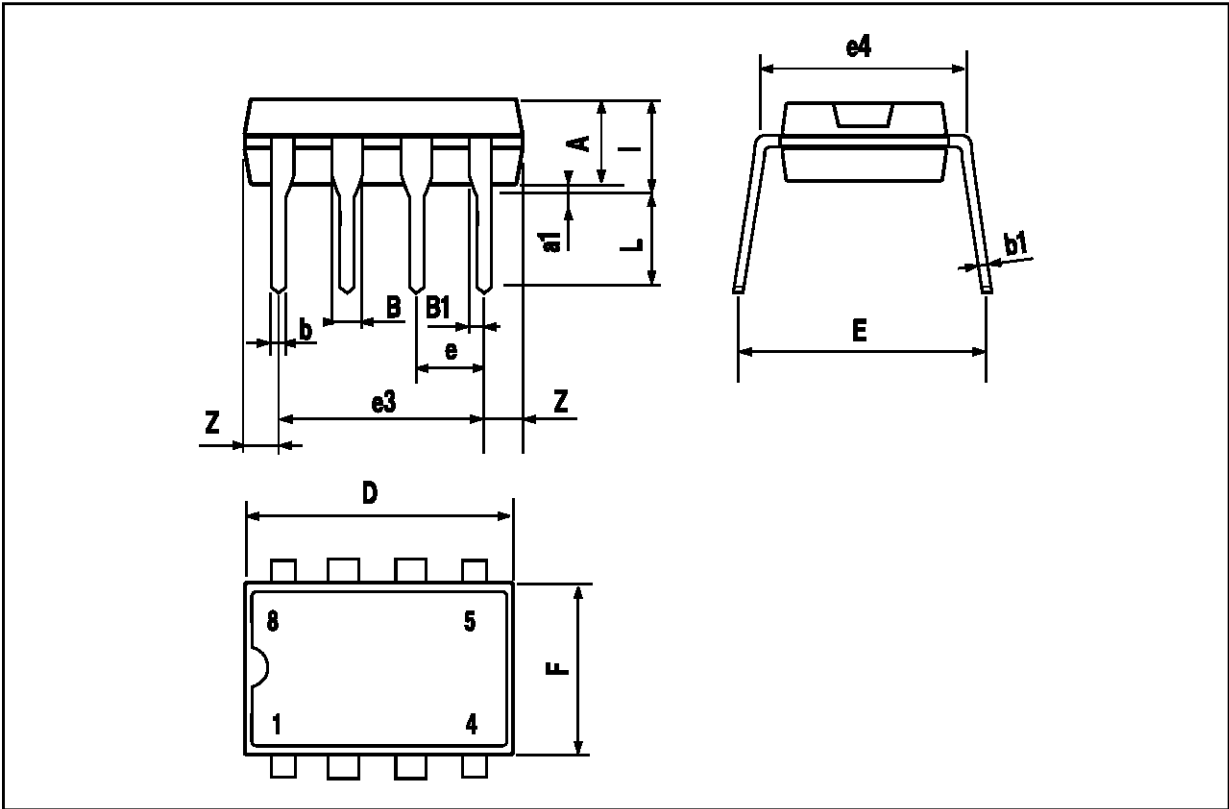
SO8 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.069
a1	0.1		0.25	0.004		0.010
a2			1.65			0.065
a3	0.65		0.85	0.026		0.033
b	0.35		0.48	0.014		0.019
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.020
c1	45° (typ.)					
D	4.8		5.0	0.189		0.197
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.6			0.024
S	8° (max.)					



MINIDIP PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A		3.32			0.131	
a1	0.51			0.020		
B	1.15		1.65	0.045		0.065
b	0.356		0.55	0.014		0.022
b1	0.204		0.304	0.008		0.012
D			10.92			0.430
E	7.95		9.75	0.313		0.384
e		2.54			0.100	
e3		7.62			0.300	
e4		7.62			0.300	
F			6.6			0.260
I			5.08			0.200
L	3.18		3.81	0.125		0.150
Z			1.52			0.060



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