FH8810BT6

N- Channel Enhancement Mode Power MOSFET

Descriptions

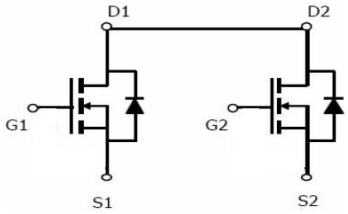
The FH8810BT6 is N-ChannelenhancementMOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS\ (ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product FH8810BT6 is Pb-free.

Applications

- DC-DC converter circuit
- Power Switch

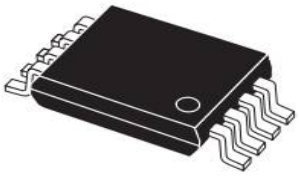
Product Summary

V_{DS} (V)	Typical Rds(on) (mΩ)
20	15 @ V_{GS}=4.5V
	16 @ V_{GS}=3.8V
	17.5 @ V_{GS}=3.1V
	19 @ V_{GS}=2.5V



Schematic diagram

Marking and pin Assignment



TSSOP-8 top view

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	20		V
Gate-Source Voltage		V_{GS}	±10		
Continuous Drain Current [a d]	T_A=25°C	I_D	6.3	5.7	A
	T_A=70°C		5.0	4.6	
Maximum Power Dissipation [a d]	T_A=25°C	P_D	1.5	1	W
	T_A=70°C		0.9	0.7	
Continuous Drain Current [b]	T_A=25°C	I_D	5.8	5.2	A
	T_A=70°C		4.6	4.1	
Maximum Power Dissipation [b]	T_A=25°C	P_D	0.9	0.7	W
	T_A=70°C		0.6	0.5	
Pulsed Drain Current [c]		I_{DM}	30		A
Operating Junction Temperature		T_J	-55 to 150		°C
Lead Temperature		T_L	260		°C
Storage Temperature Range		T_{stg}	-55 to 150		°C

Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Single Operation					
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	76	94	°C/W
	Steady State		115	145	
Junction to Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	92	115	
	Steady State		135	175	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	63	78	
Dual Operation					
Junction to Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	79	97	°C/W
	Steady State		118	148	
Junction-to-Ambient Thermal Resistance [b]	t ≤ 10 s	$R_{\theta JA}$	96	118	
	Steady State		138	180	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	66	81	

a Surface mounted on FR-4 Board using 1 square inch pad size, 1oz copper

b Surface mounted on FR-4 board using minimum pad size, 1oz copper

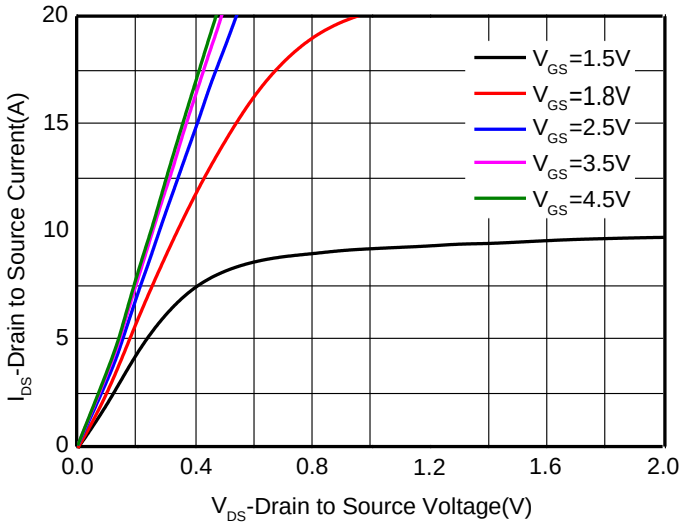
c Pulse width<380μs, Duty Cycle<2%

d Maximum junction temperature T_J=150°C.

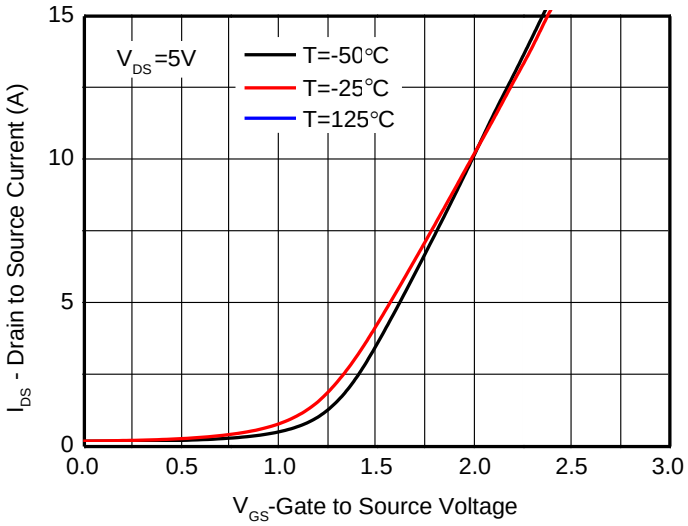
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250uA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =16 V, V_{GS} = 0V			1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±10V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250uA	0.45	0.7	1.0	V
Drain to source On resistance [b, c]	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 4 A	12	15	18	mΩ
		V_{GS} = 3.8V, I_D = 4 A	13	16	19	
		V_{GS} = 3.1V, I_D = 4 A	14	17.5	21	
		V_{GS} = 2.5V, I_D = 2.5A	15	19	23	
Forward Transconductance	g_{FS}	V_{DS} = 5.0 V, I_D = 6.3A		16		S
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS} = 0 V, f = 1MHz, V_{DS} = 10 V		850		pF
Output Capacitance	C_{OSS}			127		
Reverse Transfer Capacitance	C_{RSS}			115		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 4.5 V, V_{DD} = 10 V, I_D =6.3 A		10.9		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.62		
Gate-to-Source Charge	Q_{GS}			1.92		
Gate to Drain Charge	Q_{GD}			2.0		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = 4.5 V, V_{DD} = 10 V, R_L= 2Ω, R_G=6 Ω		22		ns
Rise Time	tr			18		
Turn Off Delay Time	td(OFF)			62		
Fall Time	tf			28		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 1.0A		0.65	1.2	V

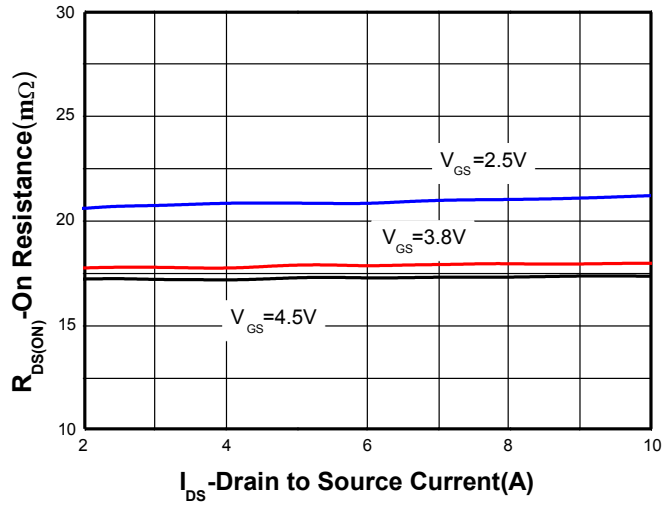
Typical Characteristics (Ta=25°C, unless otherwise noted)



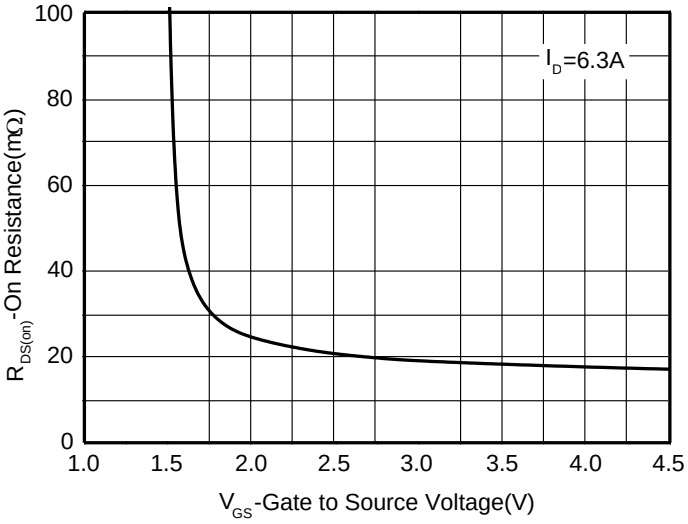
Output characteristics



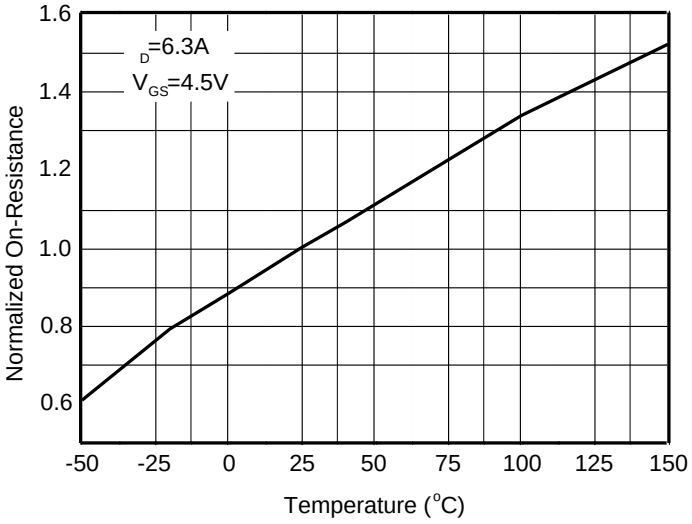
Transfer characteristics



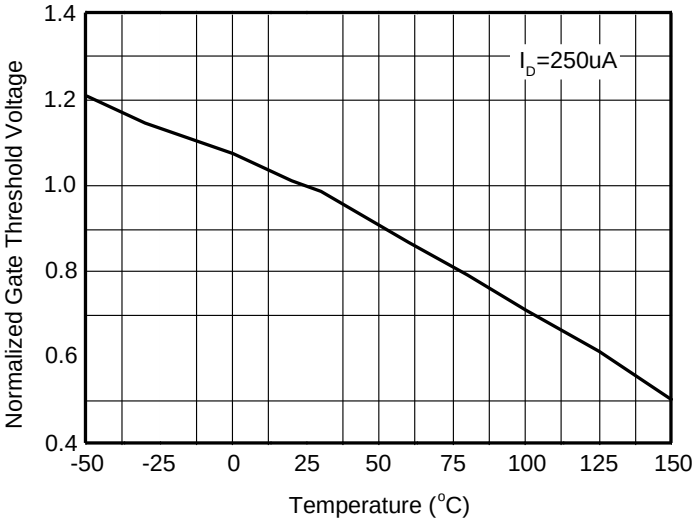
On-Resistance vs. Drain current



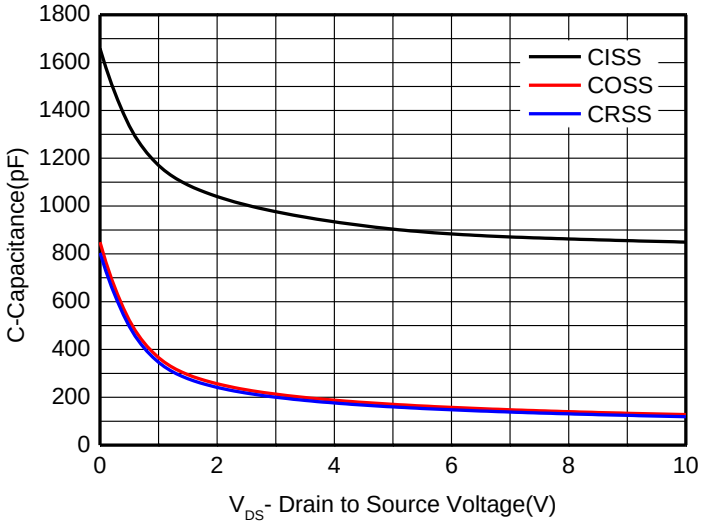
On-Resistance vs. Gate-to-Source voltage



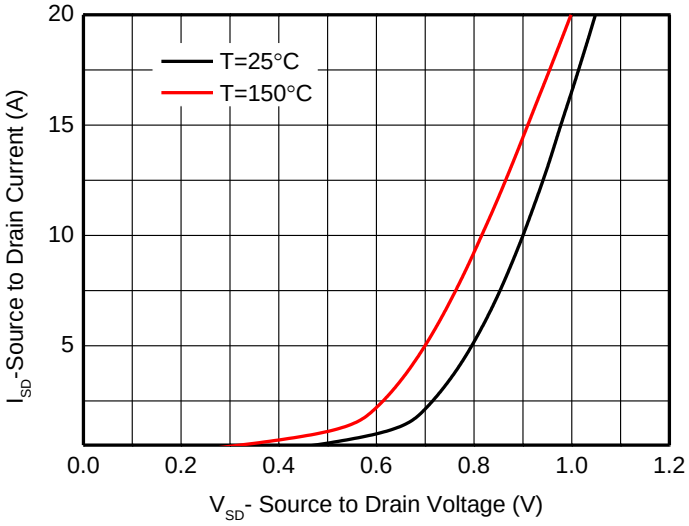
On-Resistance vs. Junction temperature



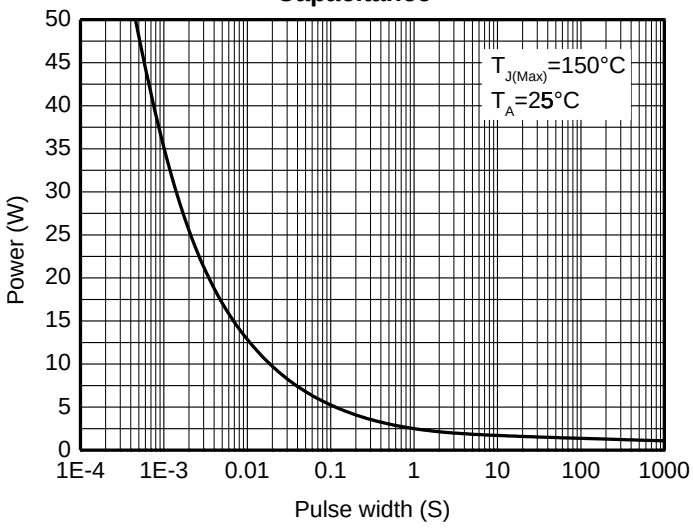
Threshold voltage vs. Temperature



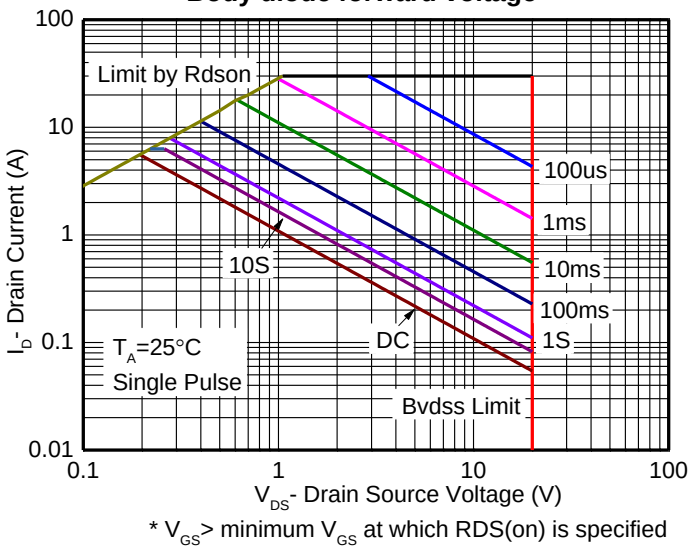
Capacitance



Body diode forward voltage

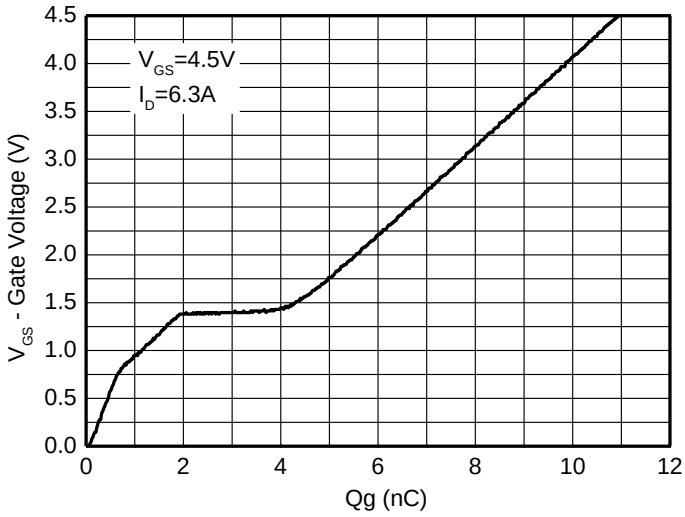


Single pulse power

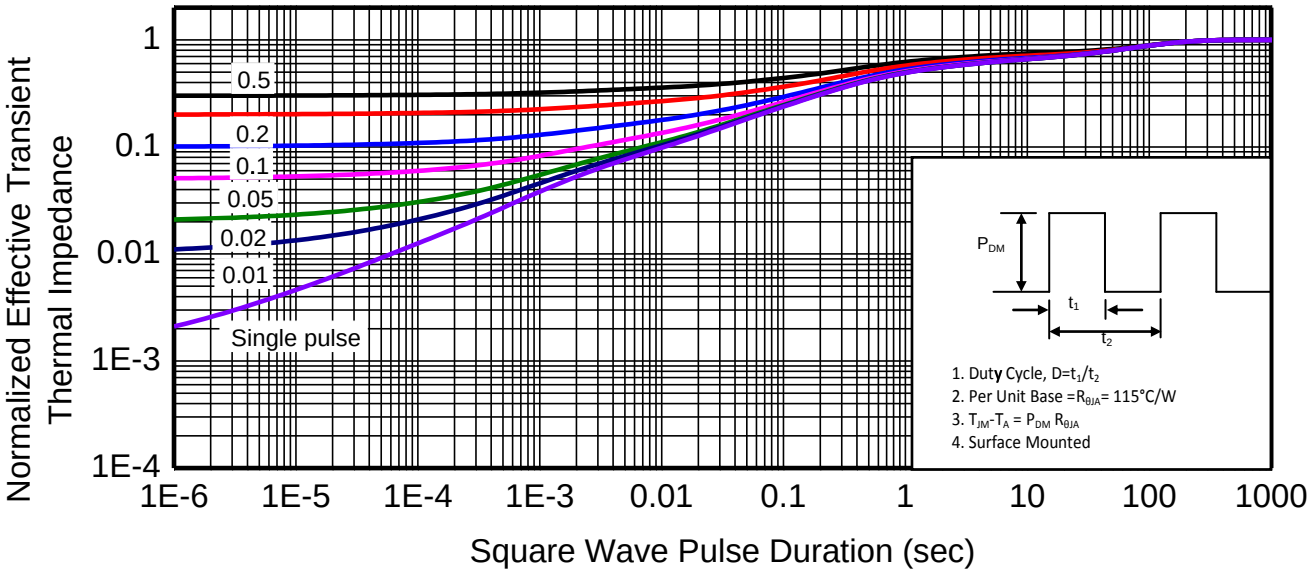


* V_{GS}> minimum V_{GS} at which RDS(on) is specified

Safe operating power

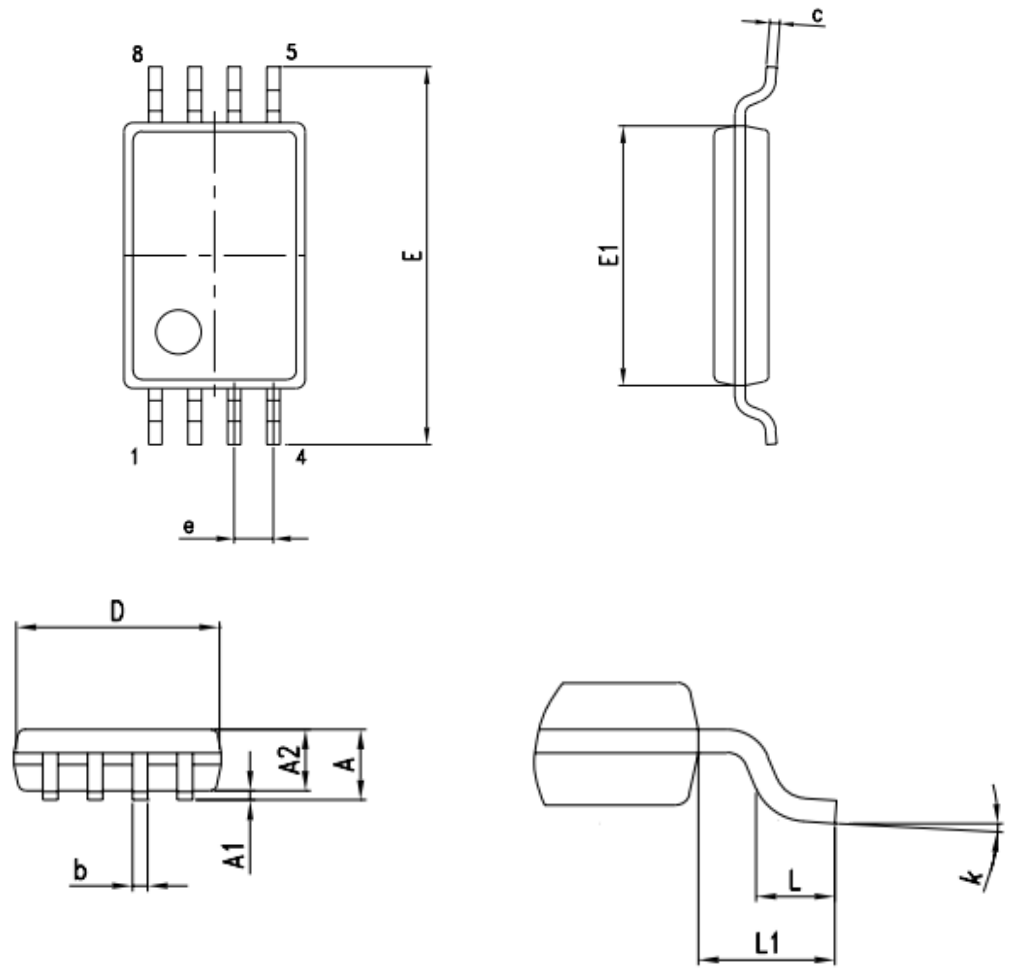


Gate Charge Characteristics



Transient thermal response (Junction-to-Ambient)

Package Outline Dimensions : TSSOP-8



DIM.	mm.			inch.		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.05		1.20	0.041		0.047
A1	0.05		0.15	0.002		0.006
A2	0.80		1.05	0.032		0.041
b	0.19		0.30	0.008		0.012
c	0.090		0.20	0.003		0.007
D	2.90		3.10	0.114		0.122
E	6.20		6.60	0.240		0.260
E1	4.30		4.50	0.170		0.177
e		0.65			0.025	
L	0.45		0.75	0.018		0.030
L1		1.00			0.039	
k	0°		8°	0.192		0.208

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