NCE N-Channel Enhancement Mode Power MOSFET

Description

The NCE8295AG uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.

Application

- Power switching application
- Hard switched and High frequency circuits
- Uninterruptible power supply

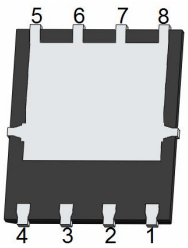
General Features

- V_{DS} =82V,I_D =95A
  $R_{DS(ON)}$ < 7.0 mΩ @ V_{GS}=10V (Typ:6mΩ)
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Special designed for convertors and power controls
- 150 °C operating temperature
- Pb-free lead plating

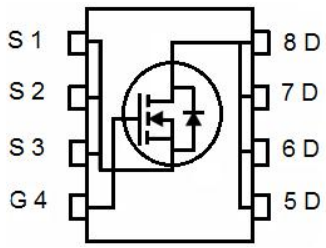
100% UIS TESTED!
100% ΔVds TESTED!

DFN 5X6

Top View



Bottom View



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
NCE8295AG	NCE8295AG	DFN5X6-8L	-	-	-

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	82	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	95	A
Drain Current-Continuous(T_C=100℃)	I_D (100℃)	67	A
Pulsed Drain Current	I_{DM}	320	A
Maximum Power Dissipation	P_D	140	W
Derating factor		1.12	W/℃
Single pulse avalanche energy (Note 5)	E_{AS}	480	mJ
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Case (Note 2)	$R_{\theta JC}$	0.89	℃/W

Electrical Characteristics (T_A=25℃unless otherwise noted)

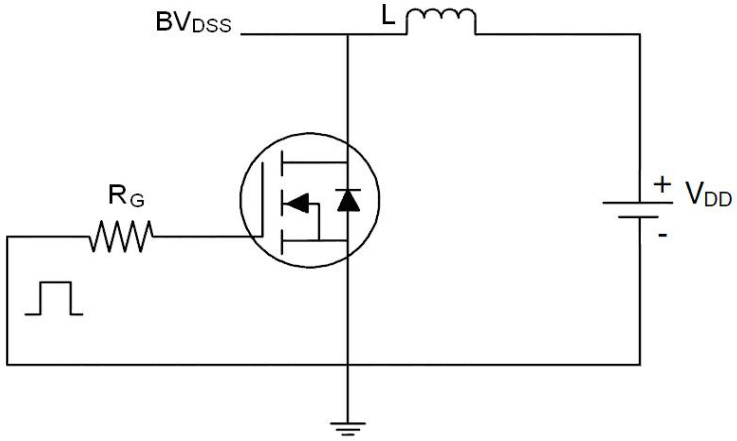
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	82	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=82V,V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2	2.9	4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A	-	6	7.0	mΩ
Forward Transconductance	g_{FS}	V_{DS}=5V,I_D=20A	-	50	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=40V,V_{GS}=0V, F=1.0MHz	-	5633	-	PF
Output Capacitance	C_{oss}		-	268	-	PF
Reverse Transfer Capacitance	C_{rss}		-	226	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=40V,R_L=15Ω R_G=2.5Ω,V_{GS}=10V	-	18	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	56	-	nS
Turn-Off Fall Time	t_f		-	15	-	nS
Total Gate Charge	Q_g	V_{DS}=40V,I_D=50A, V_{GS}=10V	-	109.3	-	nC
Gate-Source Charge	Q_{gs}		-	35.1	-	nC
Gate-Drain Charge	Q_{gd}		-	25.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=95A	-	-	1.2	V
Diode Forward Current (Note 2)	I_S		-	-	95	A
Reverse Recovery Time	t_{rr}	Tj=25℃,I_F=95A di/dt=100A/μs (Note3)	-		37	nS
Reverse Recovery Charge	Qrr		-		58	nC

Notes:

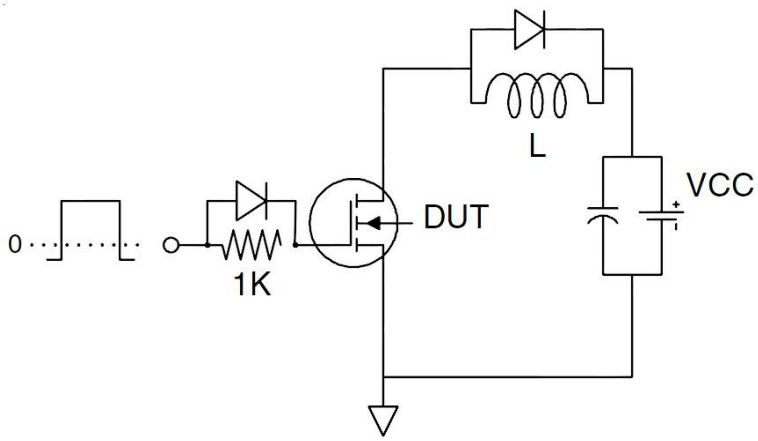
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production
5. EAS condition：Tj=25℃,V_{DD}=40V,V_G=10V,L=0.5mH,Rg=25Ω

Test Circuit

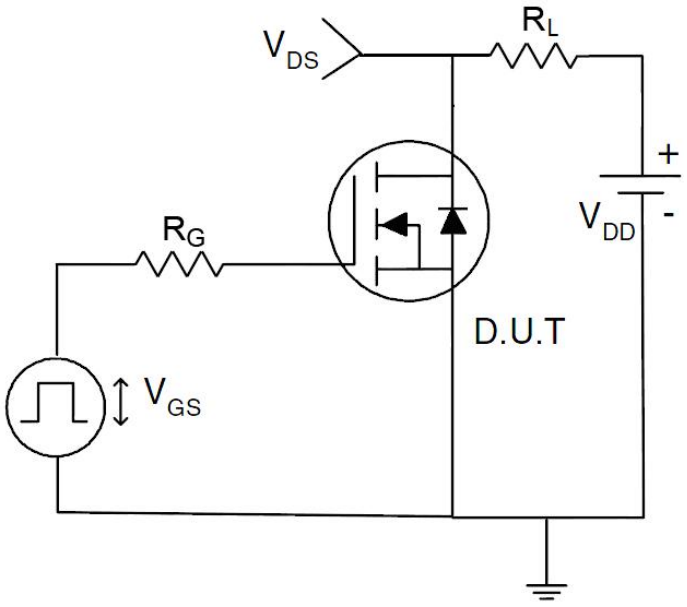
1) E_{AS} Test Circuits



2) Gate Charge Test Circuit



3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves

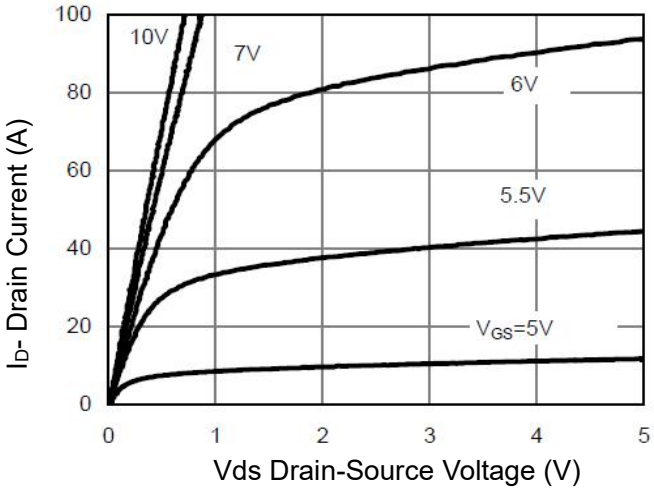


Figure 1 Output Characteristics

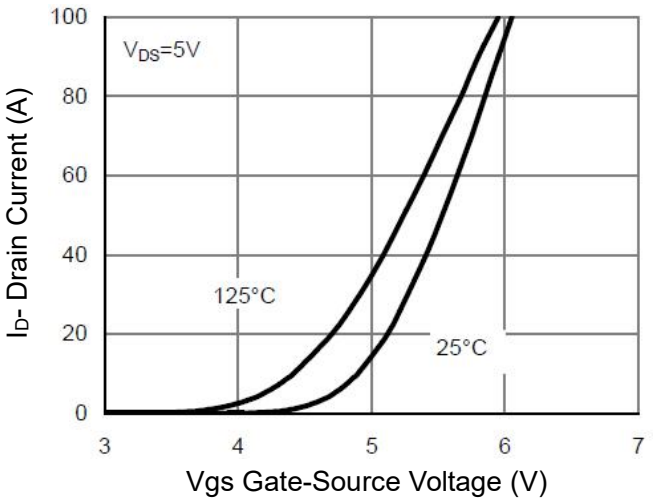


Figure 2 Transfer Characteristics

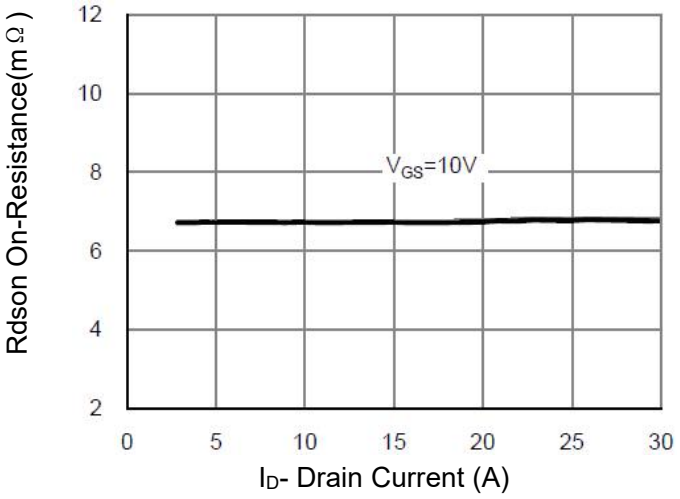


Figure 3 Rdson- Drain Current

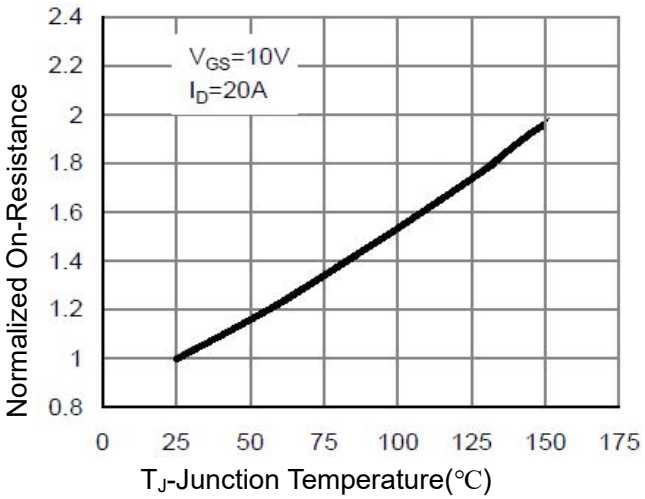


Figure 4 Rdson-Junction Temperature

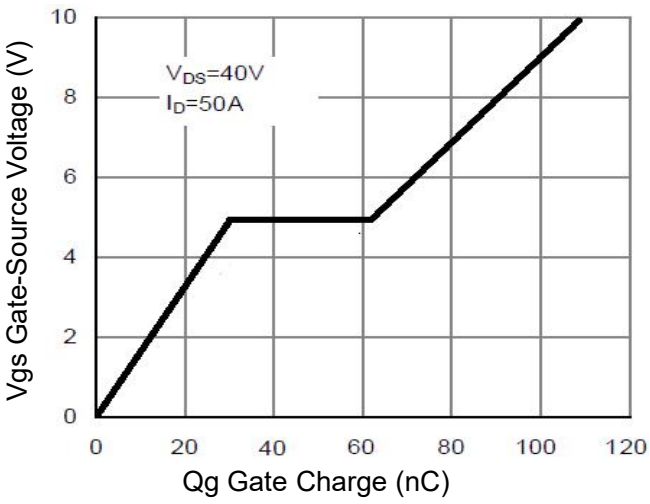


Figure 5 Gate Charge

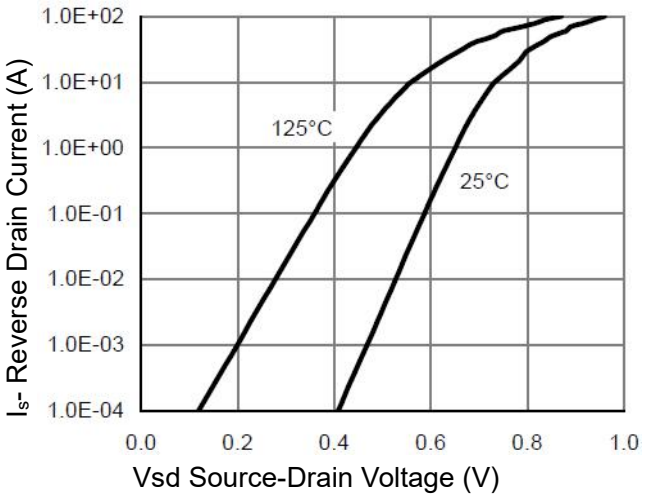


Figure 6 Source- Drain Diode Forward

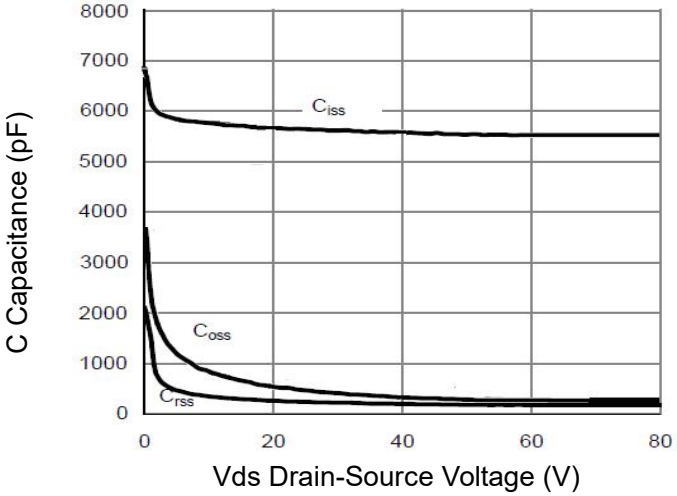


Figure 7 Capacitance vs Vds

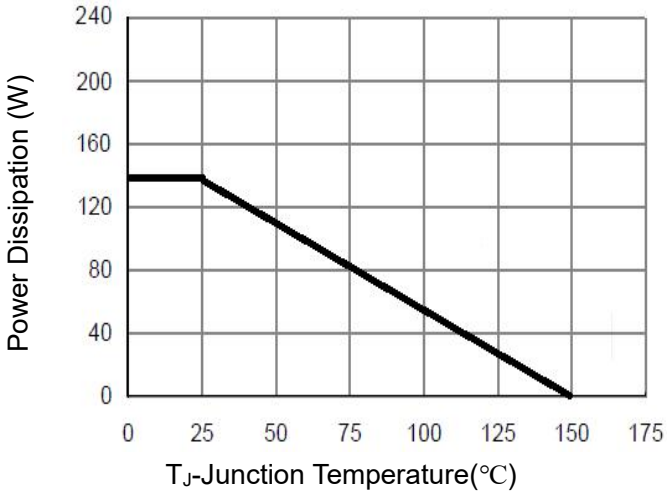


Figure 9 Power De-rating

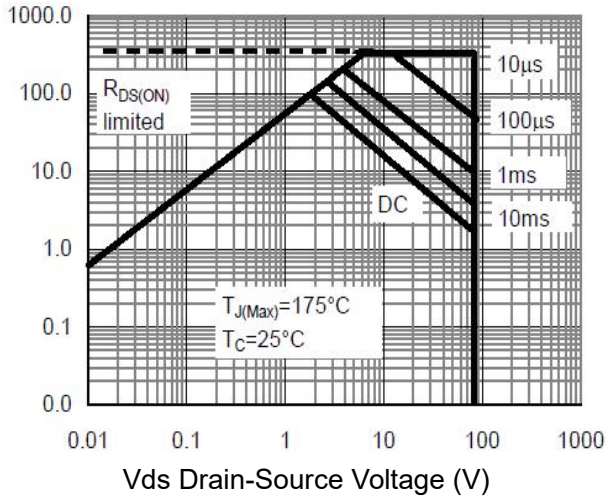


Figure 8 Safe Operation Area

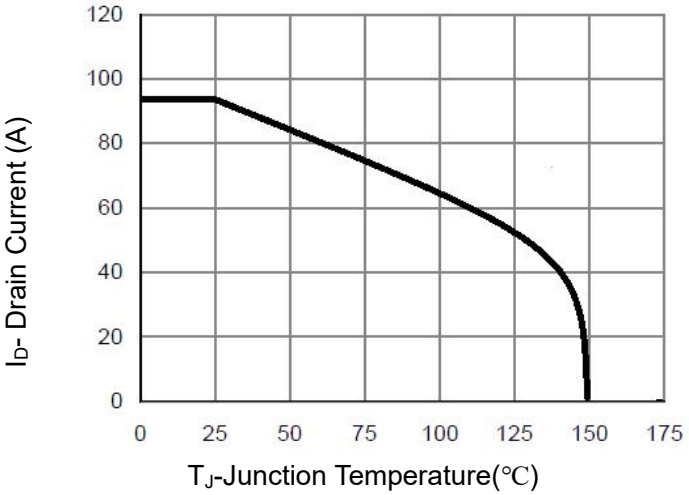


Figure 10 I_D Current De-rating

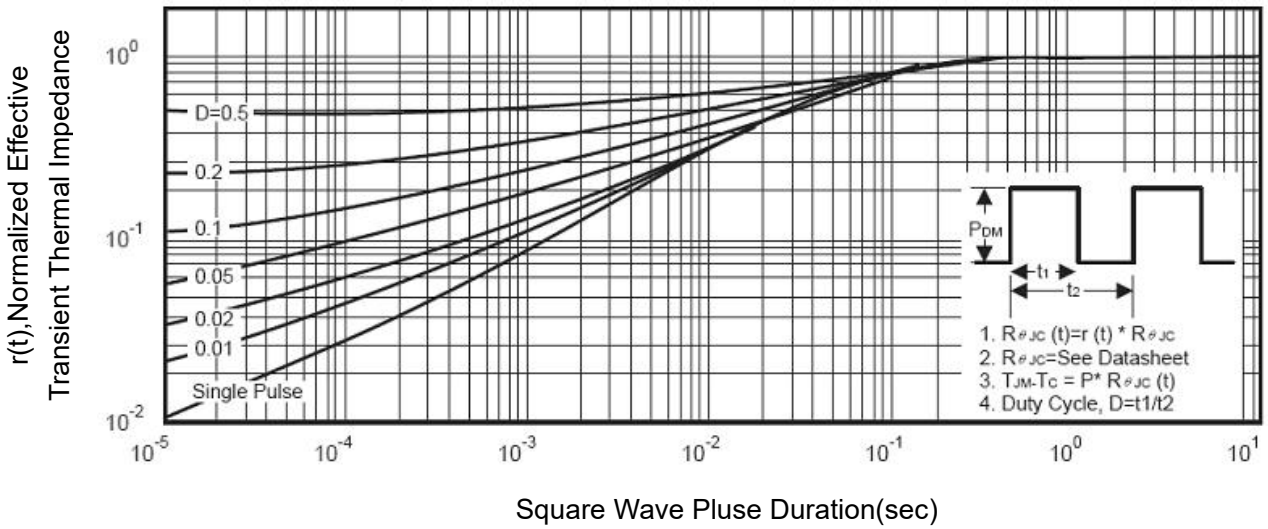
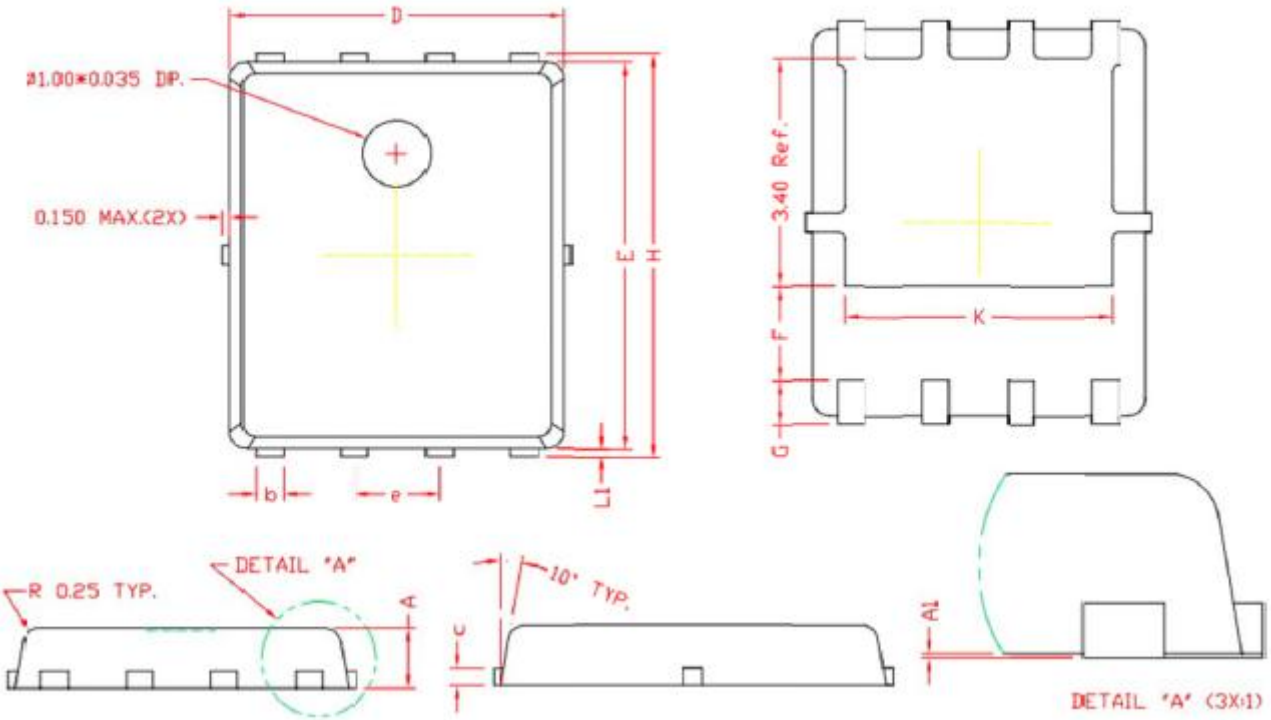


Figure 11 Normalized Maximum Transient Thermal Impedance

DFN5X6-8L Package Information



COMMON DIMENSIONS

(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.80	0.90	1.00
A1	0.00	0.03	0.05
b	0.35	0.42	0.49
c		0.254 REF.	
D	4.90	5.00	5.10
F		1.40 REF.	
E	5.70	5.80	5.90
e		1.27 BSC.	
H	5.95	6.08	6.20
L1	0.10	0.14	0.18
G		0.60 REF.	
K		4.00 REF.	

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