

Product Summary

V_{DS} (V)	$R_{DS(on),max}$ (mΩ)	I_D (A)
40	2.6 @ $V_{GS} = 10V$	130 ⁽¹⁾

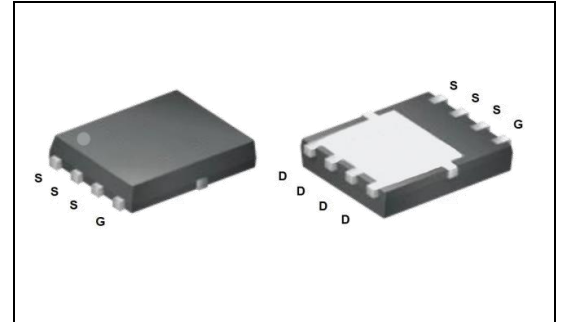
Features

- Low $R_{DS(on)}$ SGT technology
- Low thermal impedance
- Fast switching speed
- 100% avalanche tested

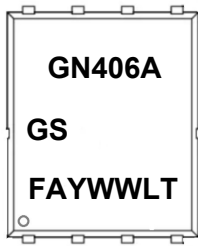
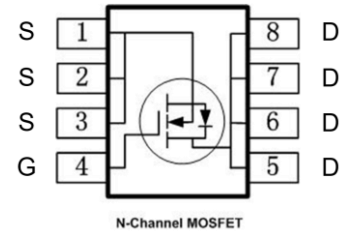
Application

- Power management
- SMPS and general purpose applications
- Uninterruptible Power Supply
- Load Switch

PDFN5060



Equivalent circuit



PDFN5060

NOTE:
 LOGO - GS
 GN406A- Part number
 code F - Fab location code
 A - Assembly location code
 Y - Year code
 WW - Week code
 L&T - Assembly lot code

Absolute maximum rating@25°C

Parameter	Symbol	Limit	Unit
Drain-source voltage	V_{DS}	40	V
Gate-source voltage	V_{GS}	±20	
Continuous drain current	I_D	130	A
Pulsed drain current ⁽²⁾	$I_{D,pulse}$	520	
Avalanche energy, single pulse ⁽³⁾	E_{AS}	257	mJ
Power dissipation	P_D	100	W
Operating junction and storage temperature range	T_J, T_{stg}	-55 to 150	°C

Thermal Characteristic

Parameter	Symbol	Max.	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	1.25	°C/W
Thermal resistance, junction-to-ambient ⁽⁴⁾	$R_{\theta JA}$	58	

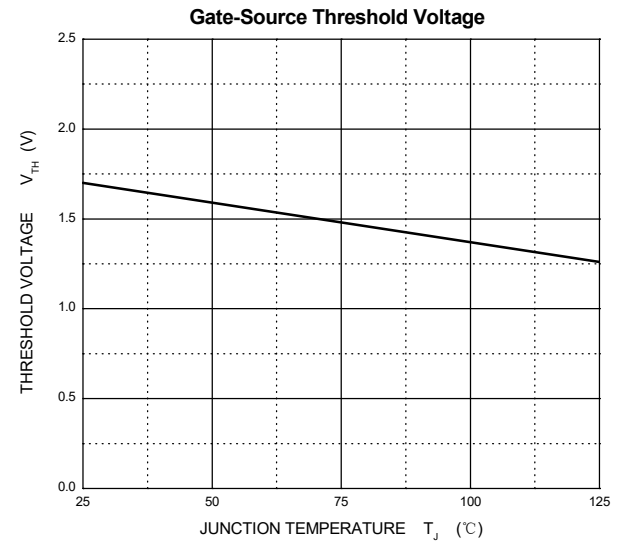
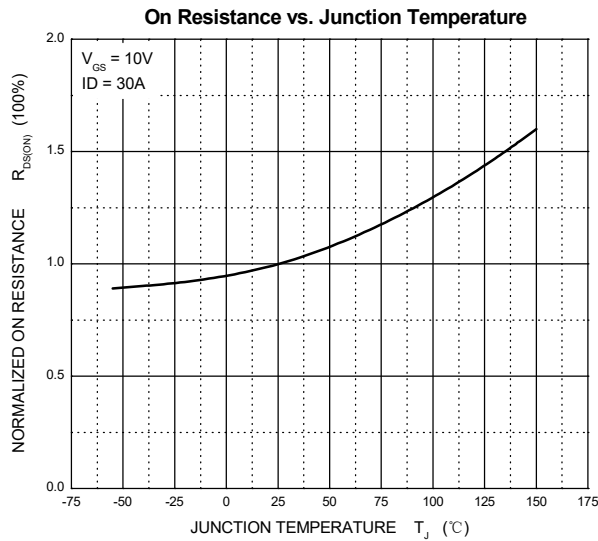
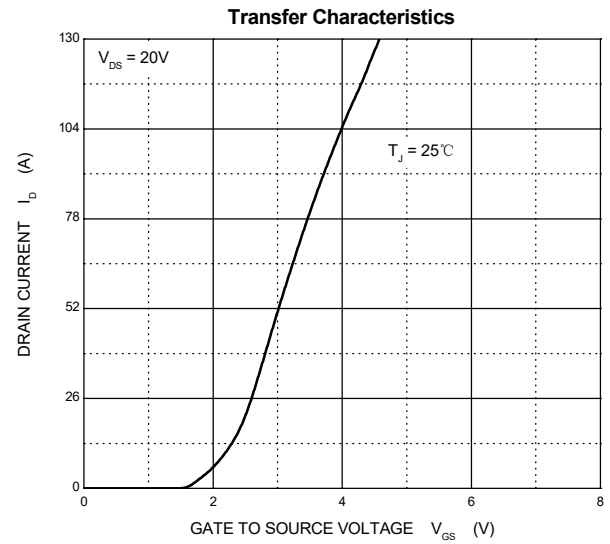
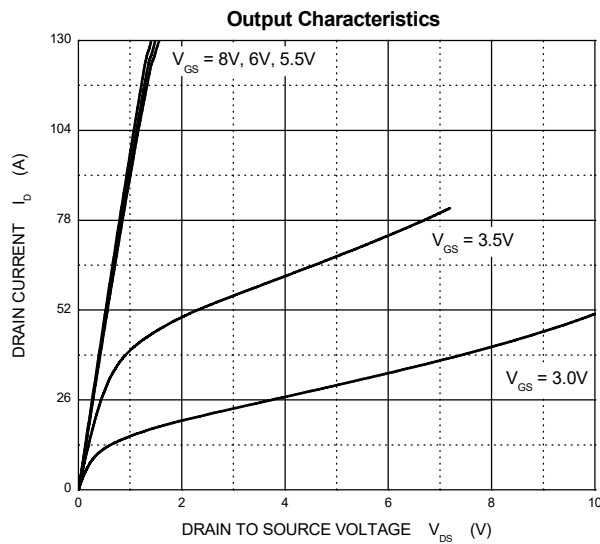
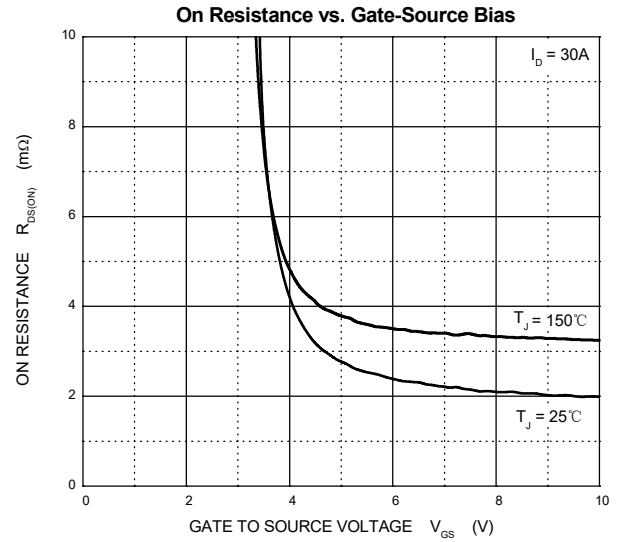
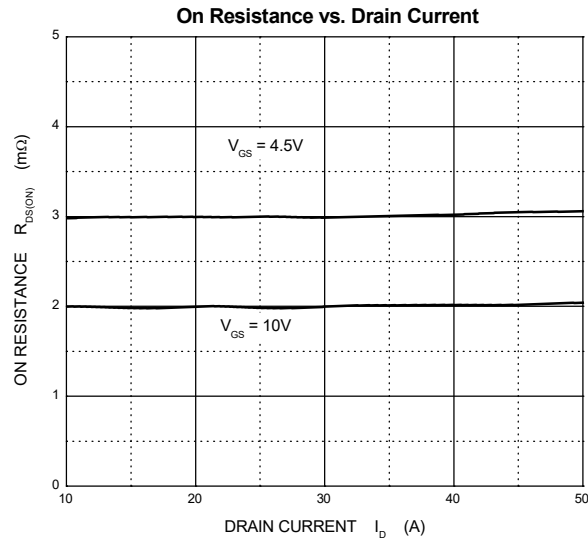
Electrical Characteristics (T_J=25°C unless otherwise noted)

Parameter	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Static parameter						
Drain to source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0, I _D = 250 μA	40			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.2	1.6	2.2	V
Gate-body leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero gate voltage drain current	I _{DSS}	V _{DS} = 40 V, V _{GS} = 0 V			1	μA
Drain-source on-resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 20 A		2.1	2.6	mΩ
		V _{GS} = 4.5 V, I _D = 20 A		2.7	3.4	mΩ
Forward transconductance ⁽⁵⁾	g _{fs}	V _{DS} = 5 V, I _D = 30 A		63		S
Gate resistance	R _g	f = 1 MHz		1.5		Ω
Dynamic ⁽⁵⁾						
Total gate charge V _{GS} = 10V	Q _g	V _{DS} = 20 V, I _D = 20 A, V _{GS} = 10 V		19		nC
Total gate charge V _{GS} = 6.0V	Q _g			11		
Gate-source charge	Q _{gs}			4.6		
Gate-drain charge	Q _{gd}			4.5		
Turn-on delay time	t _{d(on)}	V _{DS} = 20 V, R _L = 0.8 Ω, V _{GS} = 10 V, R _{GEN} = 5 Ω		11.4		ns
Rise time	t _r			2.8		
Turn-off delay time	t _{d(off)}			46		
Fall time	t _f			23.7		
Input capacitance	C _{iss}	V _{DS} = 20 V, V _{GS} = 0 V, f = 100K Hz		1705		pF
Output capacitance	C _{oss}			555		
Reverse transfer capacitance	C _{rss}			20		
Reverse Diode Characteristics ⁽⁵⁾						
Diode forward voltage	V _{SD}	V _{GS} = 0 V, I _F = 2 A		0.8	1.2	V
Reverse recovery time	t _{rr}	I _F = 20 A, di/dt = 100 A/μs		48		ns
Reverse recovery charge	Q _{rr}			67		nC

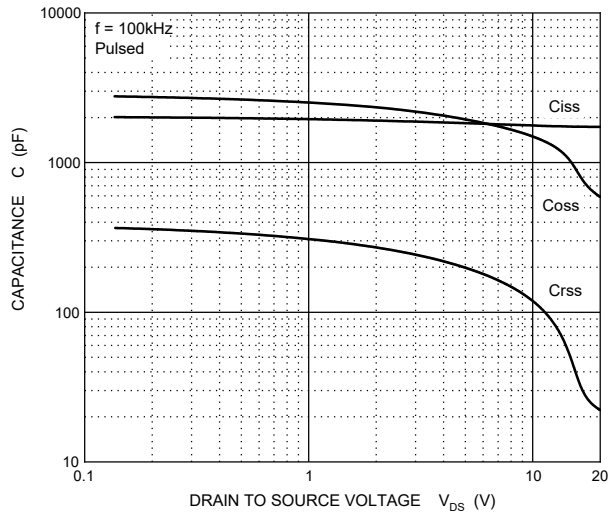
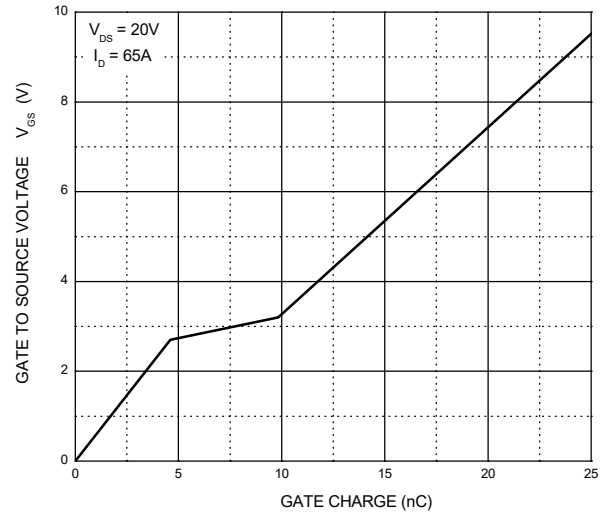
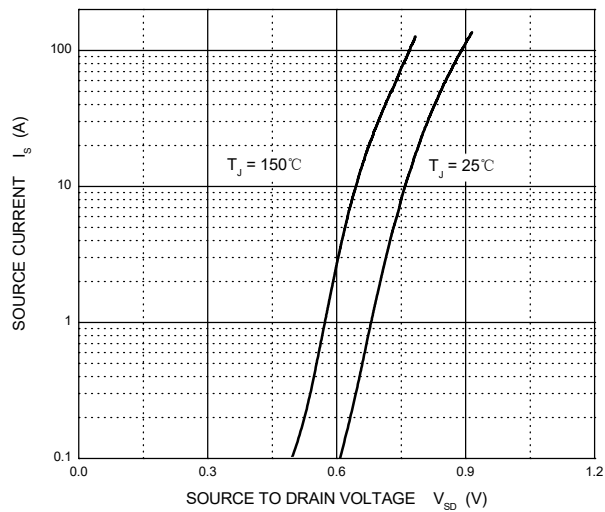
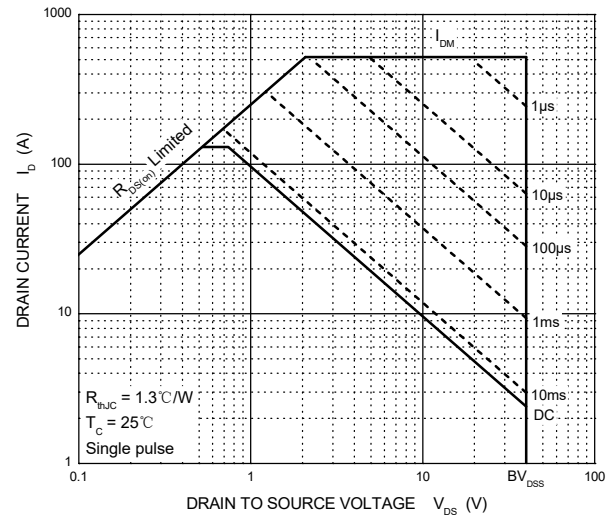
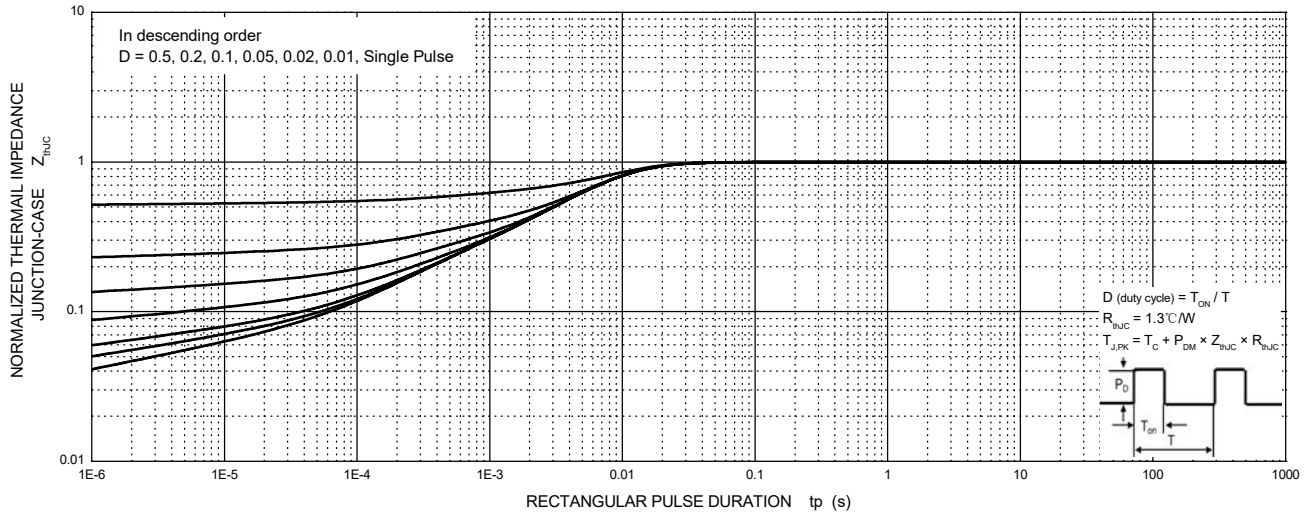
Notes

- (1) Limited by maximum junction temperature.
- (2) Pulse width limited by maximum junction temperature.
- (3) V_{DS} = 20 V, V_{GS} = 10 V, L = 0.5 mH.
- (4) Device mounted on FR-4 substrate PC board with 2oz copper in 1inch square cooling area.
- (5) Guaranteed by design, not subject to production testing.

Typical Performance Characteristics

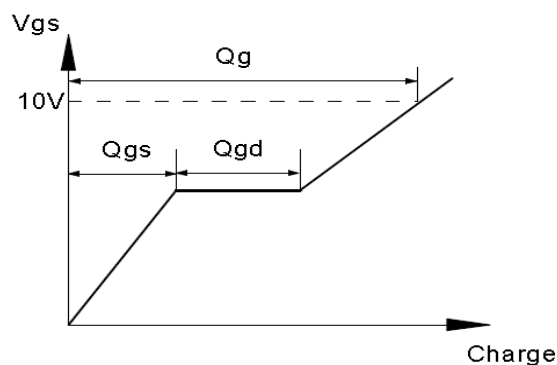
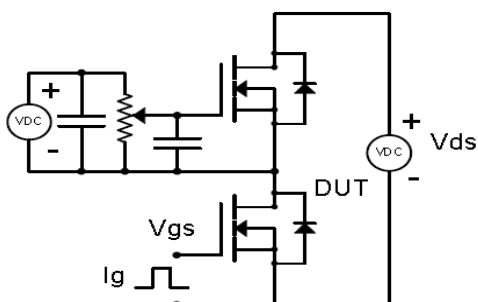


Typical Performance Characteristics

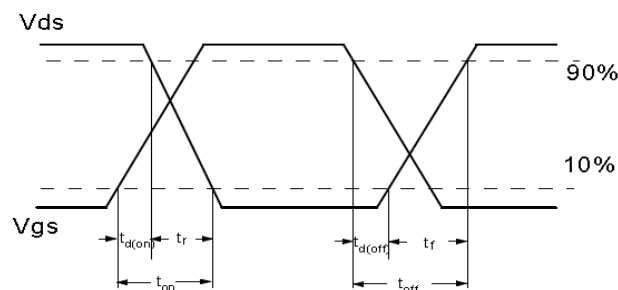
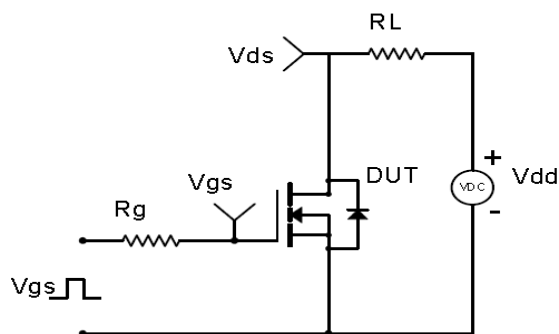
Typical Capacitances

Gate Charge

Source-Drain Diode Forward Characteristics

Maximum Safe Operating Area

Transient Thermal Impedance, Junction-Case


Test Circuit & Waveform

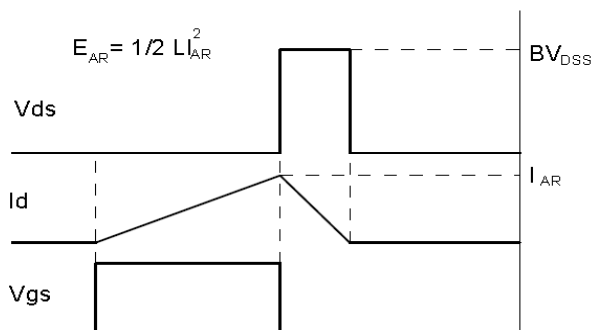
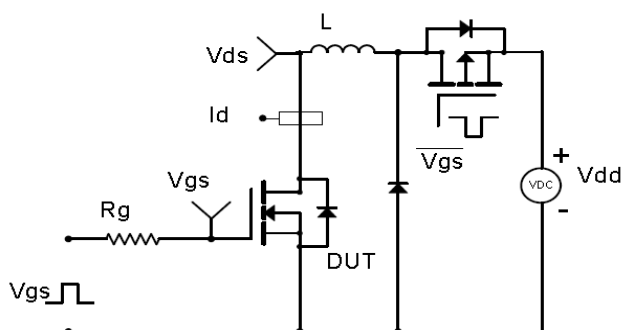
Gate Charge Test Circuit & Waveform



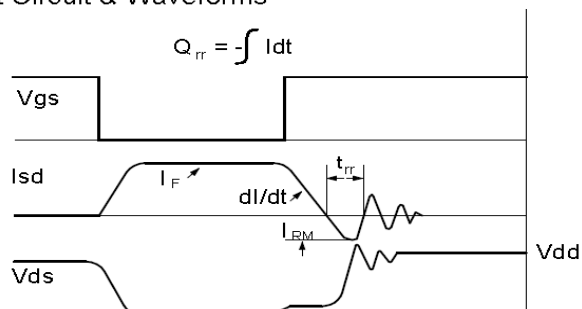
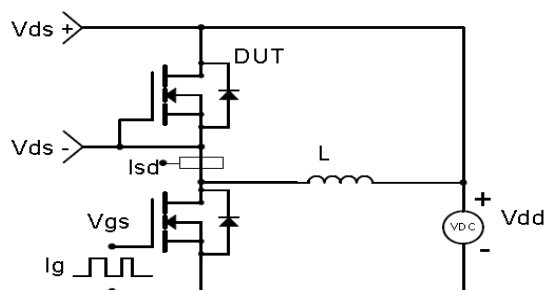
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

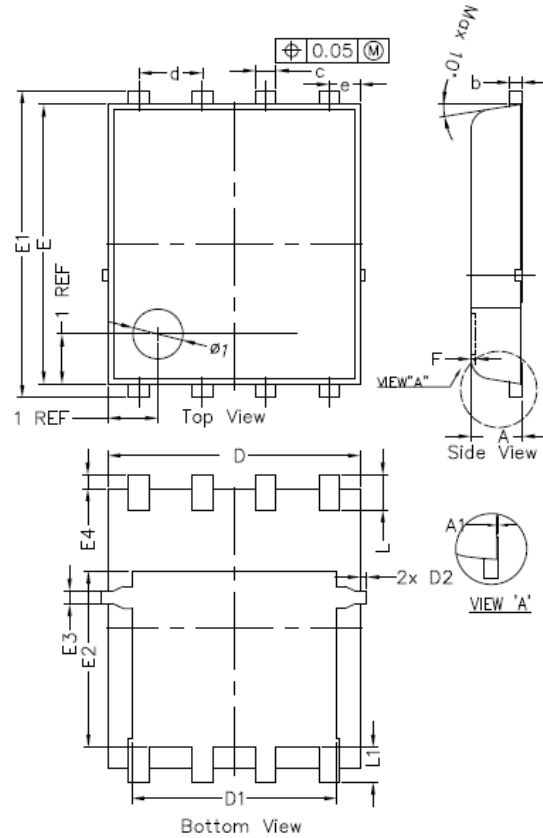


Diode Recovery Test Circuit & Waveforms





Outline Drawing PDFN5060



Dim	Millimeters		
	Min	Nom	Max
A	0.900	1.000	1.100
A1	0.000	---	0.050
b	0.246	0.254	0.312
c	0.310	0.410	0.510
d	1.27BSC		
D	4.950	5.050	5.150
D1	4.000	4.100	4.200
D2	---	---	0.125
e	0.62BSC		
E	5.500	5.600	5.700
E1	6.050	6.150	6.250
E2	3.425	3.525	3.625
E3	0.150	0.250	0.350
E4	0.175	0.275	0.375
F	---	---	0.100
L	0.500	0.600	0.700
L1	0.600	0.700	0.800

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