PAN40TY06Y

N-Ch 40V Fast Switching MOSFET

V_{DS}=40V, I_D=60A, $RDS_{(ON)}$=7.5mΩ

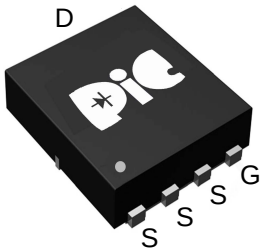
➢ General Description

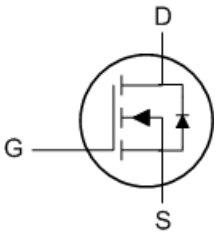
This PAN40TY06Y N-Channel enhancement mode power field effect transistor is the high density trench technology and this advanced technology can provide excellent Rds(On) performance and efficiency for power switching and load switching application., this device also comply with the RoHS and Green Product requirement with full function reliability approved.

➢ Feature

- ●Super Low Gate Charge
- ●100% EAS Guaranteed
- ●Green Device Available
- ●Excellent CdV/dt effect decline
- ●Advanced high cell density Trench technology

➢ DFN5X6A-EP1





➢ Application

- ●DC/DC Primary Side Switch
- ●Industrial Synchronous
- ●Rectification Load Switch
- ●DC/DC Converters

➢ Absolute Maximum Ratings

Parameter	Symbol	Rating	Units
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current, VGS @ 10V1	I_D@T_C=25˚C	60	A
Continuous Drain Current, VGS @ 10V1	I_D@T_C=100˚C	45	A
Pulsed Drain Current2	I_{DM}	120	A
Single Pulse Avalanche Energy3	EAS	76	mJ
Avalanche Current	I_{AS}	39	A
Total Power Dissipation4	P_D@T_C=25˚C	46	W
Storage Temperature Range	T_{STG}	-55 to 150	℃
Operating Junction Temperature Range	T_J	-55 to 150	℃
Thermal Resistance Junction-ambient (Steady State)1	$R_{\theta JA}$	62	℃/W
Thermal Resistance Junction-Case1	$R_{\theta JC}$	2.7	℃/W

➢ Electrical Characteristics (T_J=25°C Unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BVDSS	VGS=0V , ID=250uA	40	---	---	V
BVDSS Temperature Coefficient	ΔBVDSS/ΔT	Reference to 25℃ , ID=1mA	---	0.034	---	V/℃
Static Drain-Source On-Resistance2	RDS(ON)	VGS=10V , ID=12A	---	---	7.5	mΩ
		VGS=4.5V , ID=10A	---	---	10	
Gate Threshold Voltage	VGS(th)	VGS=VDS , ID =250uA	1.0	1.5	2.5	V
VGS(th) Temperature Coefficient	ΔVGS(th)		---	-4.96	---	mV/℃
Drain-Source Leakage Current	IDSS	VDS=32V , VGS=0V , TJ=25℃	---	---	1	uA
		VDS=32V , VGS=0V , TJ=55℃	---	---	5	
Gate-Source Leakage Current	IGSS	VGS=±20V , VDS=0V	---	---	±100	nA
Forward Transconductance	gfs	VDS=5V , ID=12A	---	39	---	S
Gate Resistance	Rg	VDS=0V , VGS=0V , f=1MHz	---	1.6	---	Ω
Total Gate Charge (4.5V)	Qg	VDS=20V , VGS=4.5V , ID=12A	---	18.8	---	nC
Gate-Source Charge	Qgs		---	4.7	---	
Gate-Drain Charge	Qgd		---	8.2	---	
Turn-On Delay Time	Td(on)	VDD=15V , VGS=10V , RG=3.3 ID=1A	---	14.3	---	ns
Rise Time	Tr		---	2.6	---	
Turn-Off Delay Time	Td(off)		---	77	---	
Fall Time	Tf		---	4.8	---	
Input Capacitance	Ciss	VDS=15V , VGS=0V , f=1MHz	---	2332	---	pF
Output Capacitance	Coss		---	193	---	
Reverse Transfer Capacitance	Crss		---	138	---	

➢ Diode Characteristics

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Continuous Source Current1,5	IS	VG=VD=0V , Force Current	---	---	60	A
Pulsed Source Current2,5	ISM		---	---	120	A
Diode Forward Voltage2	VSD	VGS=0V , IS=1A , TJ=25℃	---	---	1	V

Note :

1.Pulse width limited by maximum junction temperature.

2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%

3.The EAS data shows Max. rating The test condition is V_{DD}=25V,V_{GS}=10V,L=0.1mH,I_{AS}=39A

4.Ensure that the channel temperature does not exceed 150°C.

5.The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

➢ Typical Characteristics

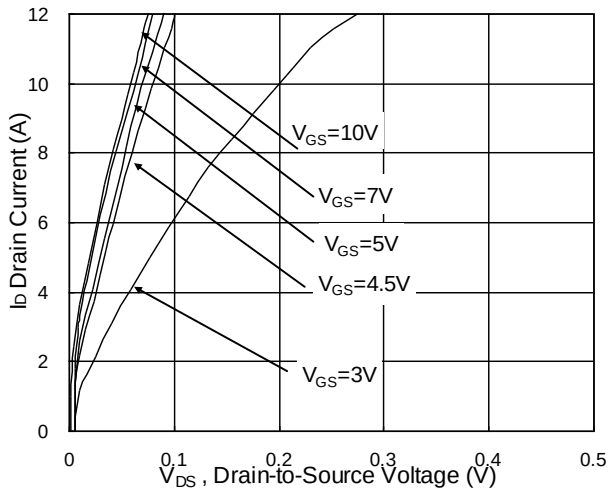


Fig.1 Typical Output Characteristics

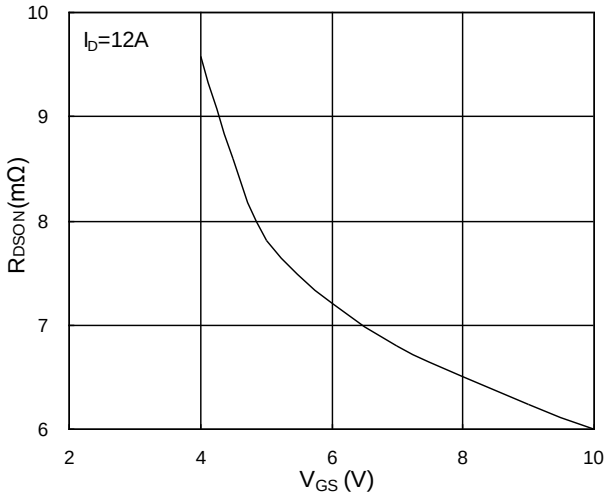


Fig.2 On-Resistance vs. G-S Voltage

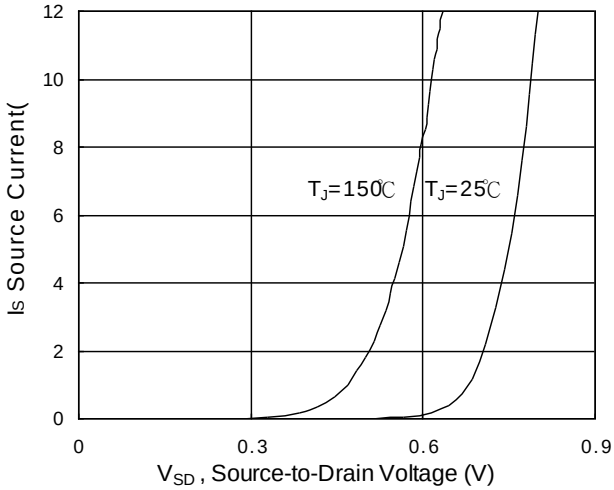


Fig.3 Forward Characteristics of Reverse

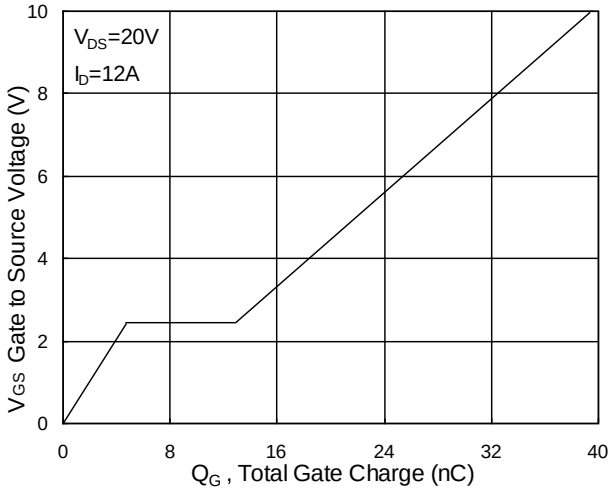


Fig.4 Gate-Charge Characteristics

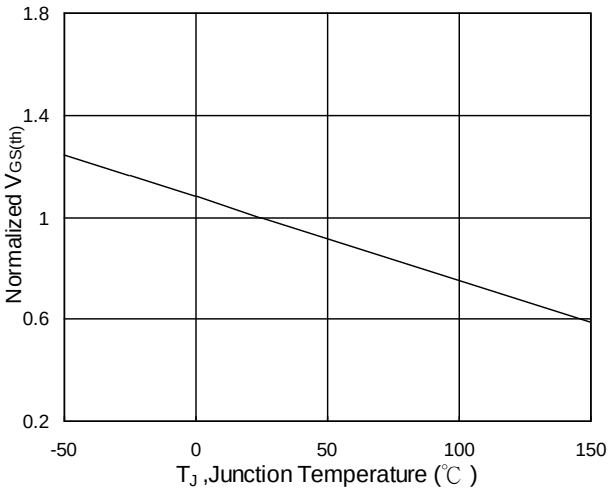


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

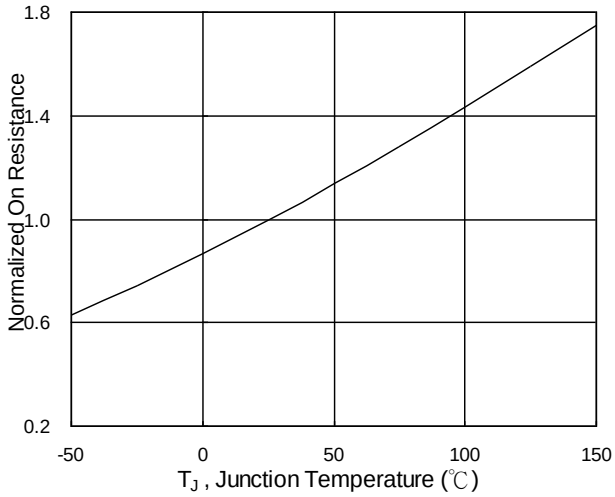


Fig.6 Normalized R_{DSON} vs. T_J

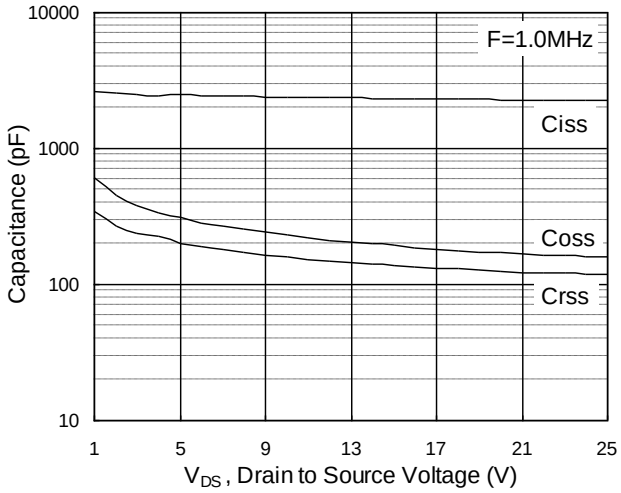


Fig.7 Capacitance

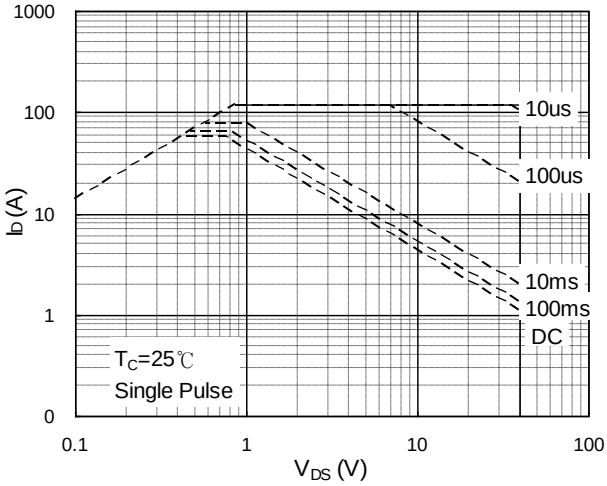


Fig.8 Safe Operating Area

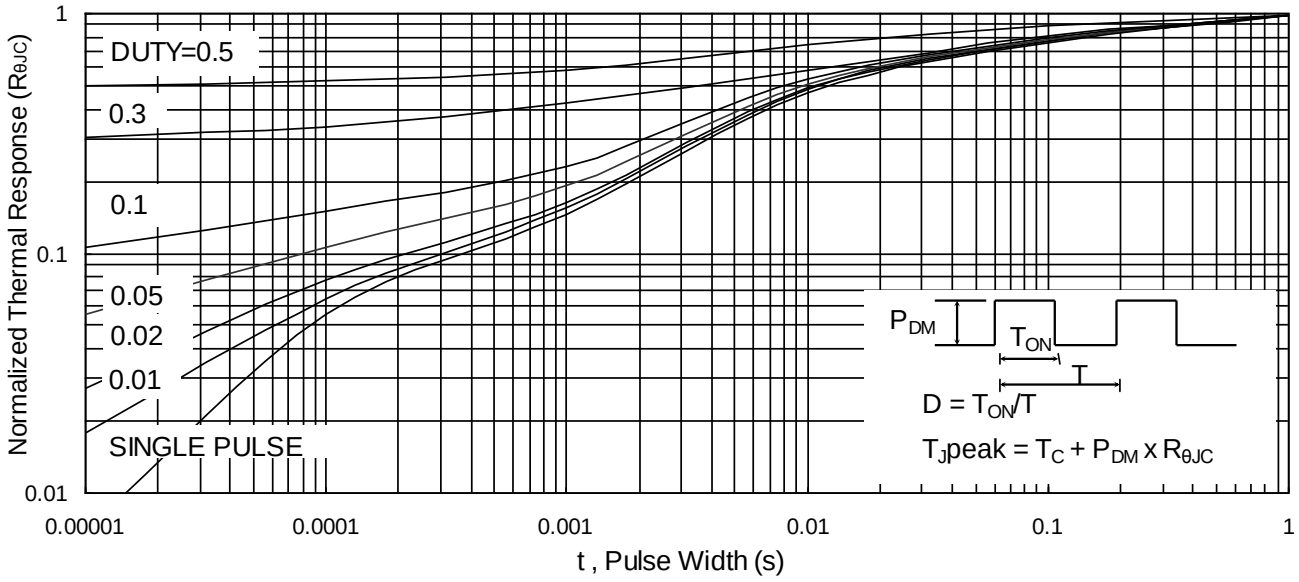


Fig.9 Normalized Maximum Transient Thermal Impedance

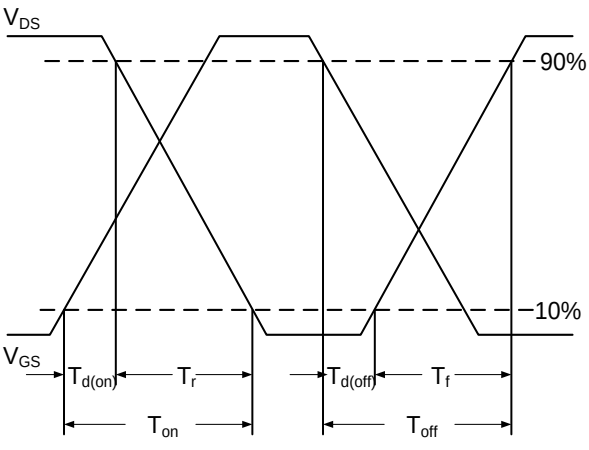


Fig.10 Switching Time Waveform

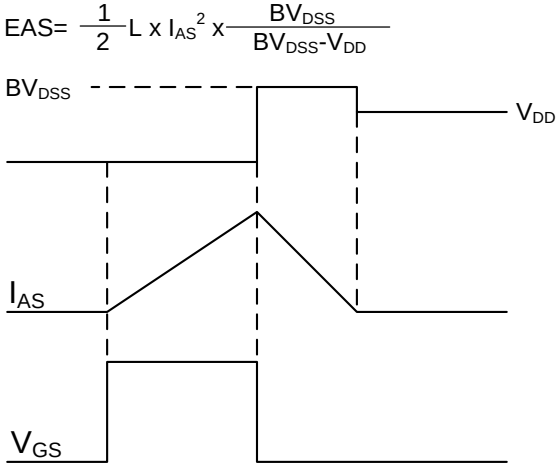
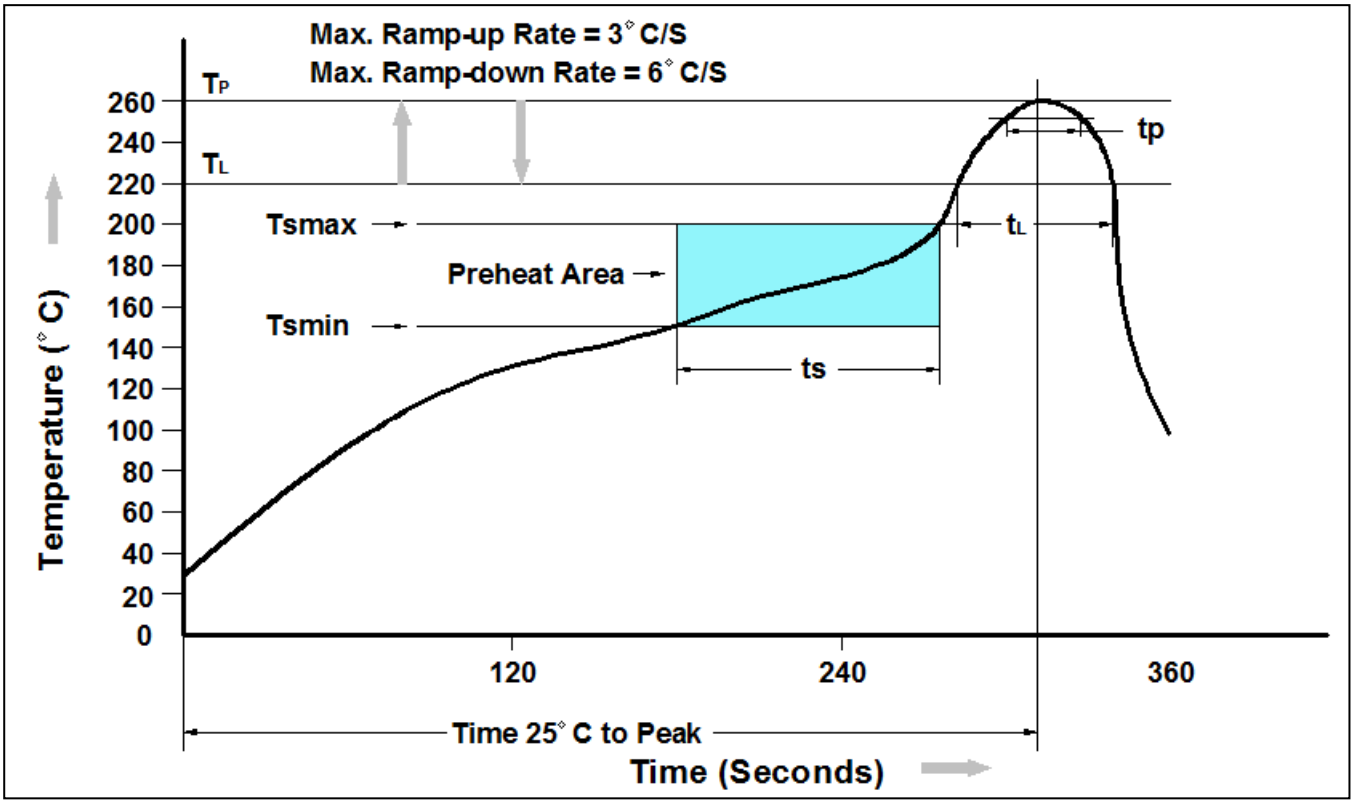


Fig.11 Unclamped Inductive Waveform

➢ Recommand IR Reflow Soldering Thermal Profile

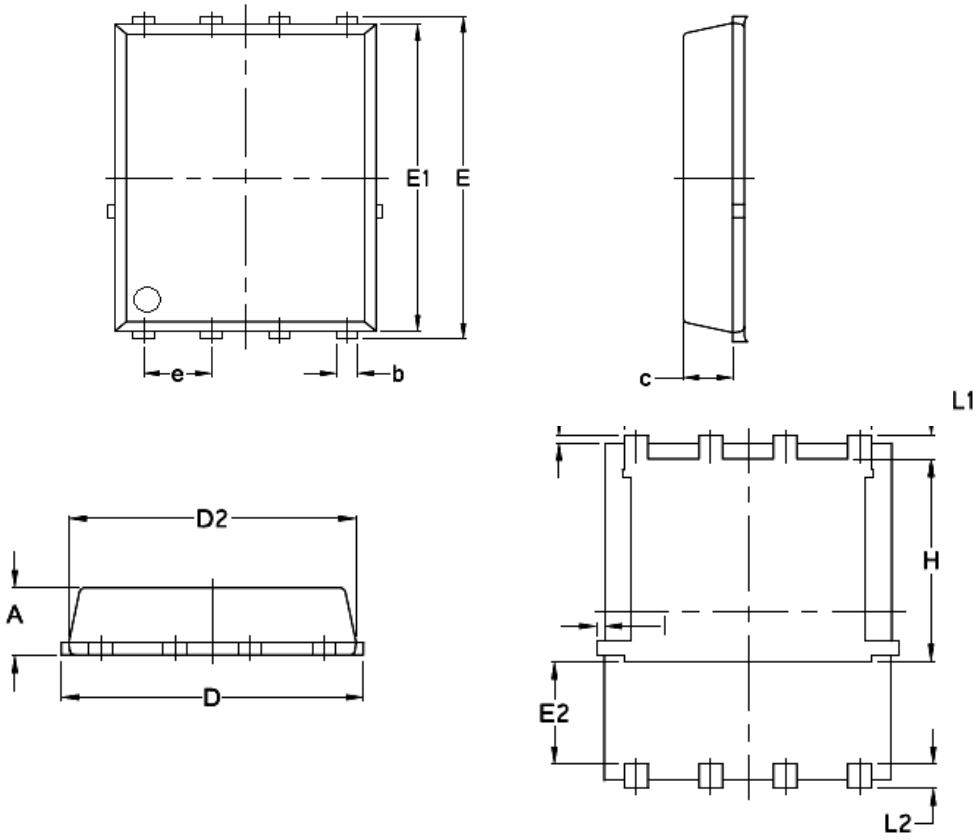


Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmin)	150°C
Temperature Max. (Tsmax)	200°C
Time (ts) from (Tsmin to Tsmax)	60-120 seconds
Average Ramp-up Rate (tL to tP)	3°C/second max.
Liquidous Temperature (TL)	217°C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Temperature	260°C +0°C / -5°C
Time (tP) within 5°C of actual Peak Temperature	30 seconds
Ramp-down Rate (TP to TL)	6°C/second max
Time 25°C to Peak Temperature	8 minutes max.

➢ Ordering Information

Part Number	Description	Quantity
PAN40TY06Y	DFN5X6A-EP1 Reel	3000 pcs

➢ Package Information (DFN5X6A-EP1)



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.03	1.17	0.0406	0.0461
b	0.34	0.48	0.0134	0.0189
c	0.824	0.970	0.0324	0.0382
D	4.80	5.40	0.1890	0.2126
D1	4.11	4.31	0.1618	0.1697
D2	4.80	5.00	0.1890	0.1969
I	---	0.18	---	0.0070
E	5.90	6.15	0.2323	0.2421
E1	5.65	5.85	0.2224	0.2303
E2	1.10	---	0.0433	---
e	1.27 BSC		0.05 BSC	
H	3.30	3.78	0.1299	0.1488
L	0.05	0.25	0.0020	0.0098
L1	0.38	0.61	0.0150	0.0240
L2	0.38	0.71	0.0150	0.0279

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