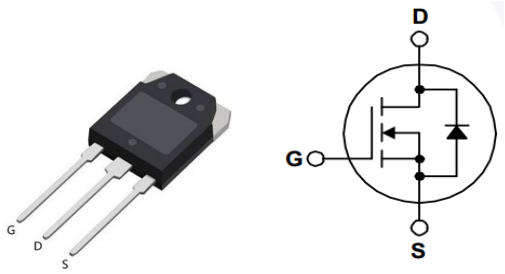
TH52N30PU

300V 52A 57mΩ Silicon N-Channel Planar Power MOSFET

Features of this MOSFET are 150℃ operating junction temperature and high repetitive peak current capability. These features combine to make this MOSFET a highly efficient, robust and reliable device for PDP driving applications.



Package view and circuit symbol

General Features

- V_{DS}=300V,I_D=52A
- Low ON Resistance,$R_{DS(on)}$,typ.=57mΩ@V_{GS}=10V,I_D=26A
- Low reverse transfer capacitance
- Low Qg for fast response
- Short fall & rise times for fast switching
- 100% single pulse avalanche energy Test

Applications

- Power switching application
- Digital amplifier
- Adapter and charger

Key Performance Parameters

Parameter	Value	Unit
V_{DSS}, min @ $T_{J = 25\ °C}$	**300**	V
T_J, maximum junction temperature	**150**	°C
I_D @ $T_{C = 25\ °C}$(Silicon Limit)	**52**	A
$I_{D,pulse}$ @ T_{C} = 25 °C, tp limited by Tjmax.	**208**	A
$R_{DS(on)}$, typ. @ $T_{J = 25\ °C}$,$V_{GS = 10\ V}$	**57**	mΩ
E_{AS}, typ. @ $T_{J = 25\ °C}$	**3080**	mJ

RoHS SGS

Marking Information

Product Name	Package	Marking
TH52N30PU	TO-3P	TH52N30PU

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Maximum Ratings (T_J = 25℃ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain to Source Voltage		V_{DSS}	300	V
Gate to Source Voltage		V_{GSS}	±30	V
Drain Current(Silicon limit)	T_C=25℃	I_D	52	A
Pulsed Drain Current	T_C=25℃ tp limited by T_{vjmax}	I_{DM}	208	A
Avalanche energy, single pulse	L=10mH, R_g=25Ω	E_{AS}	3080	mJ
Power Dissipation	T_C=25℃	P_D	446	W
Operating Junction and Storage Temperature Range		T_J,T_{stg}	-55 To +150	℃
Lead Temperature for Soldering Purposes		T_L	270	

Thermal Characteristics

Parameter	Symbol	Max Value	Unit
Thermal Resistance, Junction−to−Case	R_{thJC}	0.28	℃/W
Thermal Resistance, Junction−to−Ambient	R_{thJA}	40	

Electerical Characteristics (T_J = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition		Value min.	Value typ.	Value max.	Unit
Drain-to-Source Breakdown Voltage	B_{VDSS}	V_{GS}=0V,I_D=250μA		300	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V V_{DS}=V_{DSS}	T_J=25℃	-	-	1	μA
		V_{GS}=0V V_{DS}=80%V_{DSS}	T_J=125℃	-	-	10	
Gate−to−Source leakage Current	I_{GSS}	V_{GS}=±30V,V_{DS}=0V		-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS} , I_D=250uA	T_J=25℃	2.0	-	4.0	V
Drain-Source on-state resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=26A	T_J=25℃	-	57	68	mΩ
Gate resistance	Rg	V_{GS}=0V,V_{DS}=0V,f=1MHz		-	0.4	-	Ω
Transconductance	g_{fs}	V_{DS}=20V,I_D=26A		-	30	-	S
Input Capacitance	C_{ISS}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1 MHz		-	5080	-	pF
Output Capacitance	C_{OSS}			-	540	-	
Reverse Transfer Capacitance	C_{RSS}			-	14	-	
Total Gate Charge	Qg	V_{DS} = 150 V, V_{GS} = 0/10 V, I_D = 52 A		-	68	-	nC
Gate- Source charge	Qgs				20		
Gate-Drain charge	Qgd				28		
Turn−On Delay Time	td(on)	V_{DS} = 150 V V_{GS} = 10 V I_D = 52 A R_G = 25Ω T_J = 25℃		-	60	-	ns
Turn−Off Delay Time	td(off)			-	110	-	
Rise time	tr			-	120	-	
Fall time	tf			-	55	-	

Diode Characteristics (T_J = 25℃ unless otherwise specified)

Parameter	Symbol	Test Condition		Value min.	Value typ.	Value max.	Unit
Diode Continous Forward Current	I_S	T_C=25℃		-	-	52	A
Pulsed Diode Forward Current	I_{SM}			-	-	208	
Diode Forward Voltage	V_{SD}	I_S = 52A	T_J = 25℃	-	-	1.5	V
Reverse Recovery Time	trr	V_R = 150 V, I_S = 52 A, dI_S/dt = 100 A/μs,T_J = 25℃		-	320	-	ns
Reverse Recovery Charge	Qrr			-	4	-	uC

Typical Performance Characteristics

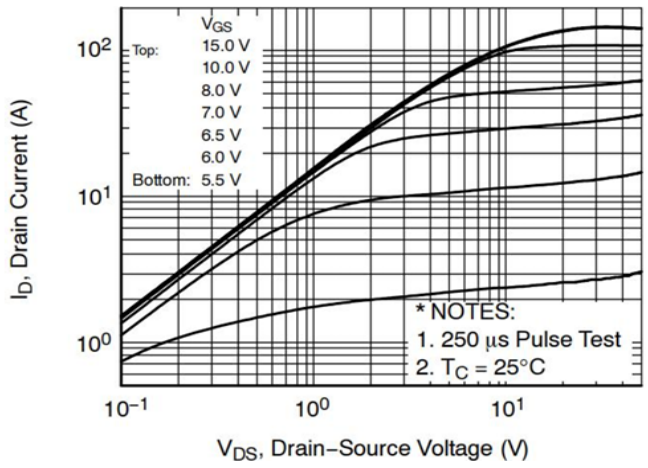


Fig 1. Typical output characteristic

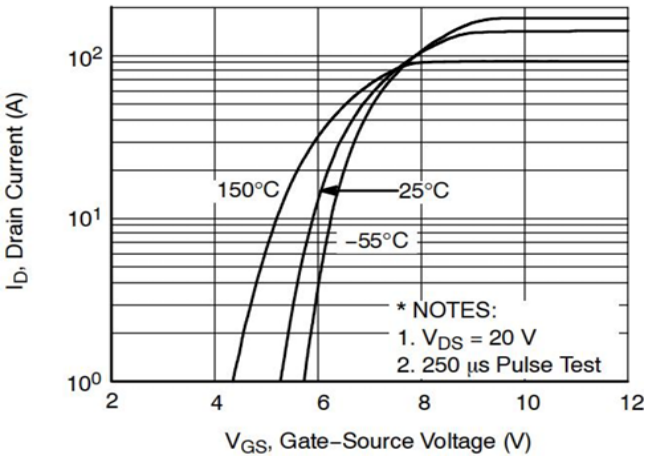


Fig 2. Typical transfer characteristic

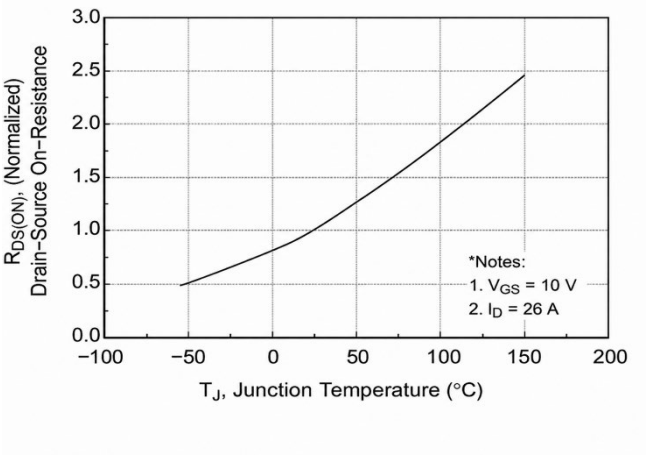


Fig 3. On-Resistance vs. Junction Temperature

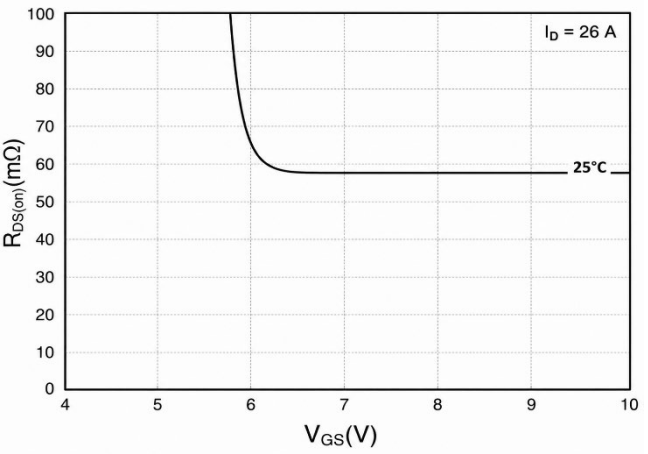


Fig 4. Rds(on) vs Gate Voltage

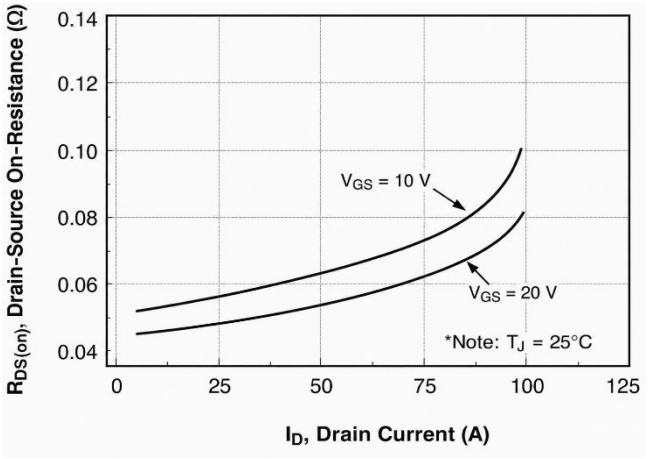


Fig 5. Rds(on) vs Drain Currentand Gate Voltage

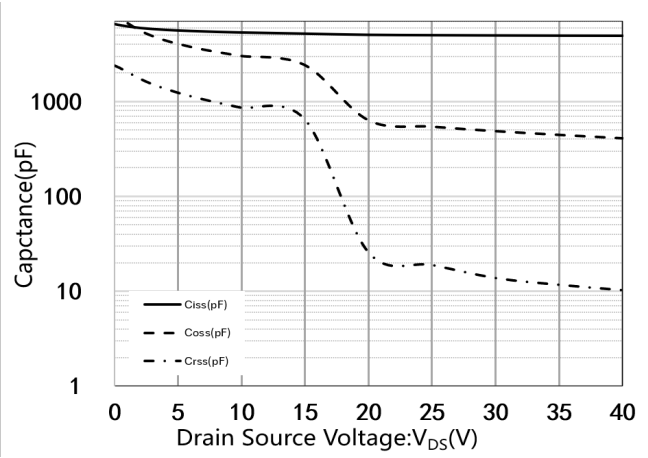


Fig 6. Capacitance Characteristics

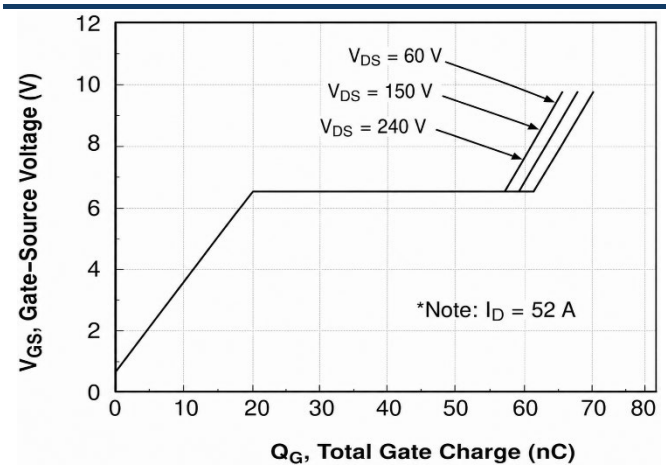


Fig 7. Gate Charge Characteristics

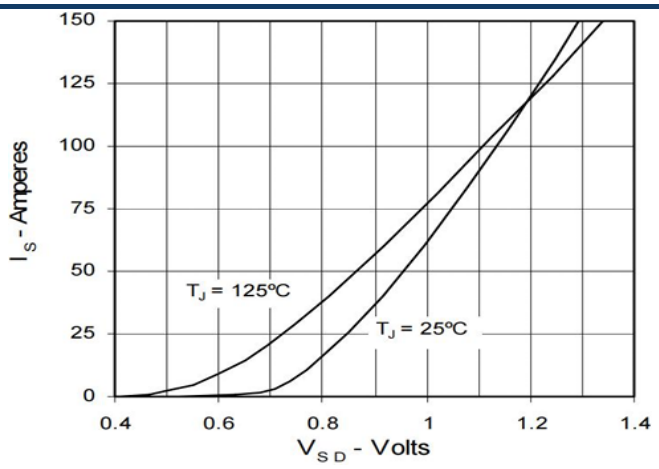


Fig 8. Body-diode Forward Characteristics

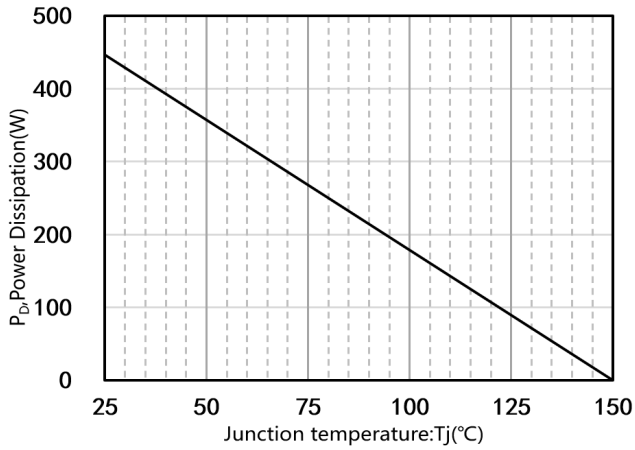


Fig 9. Power Dissipation

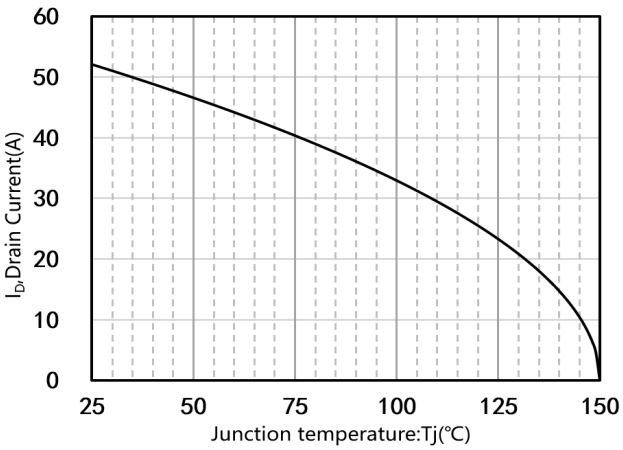


Fig 10. Drain Current Derating

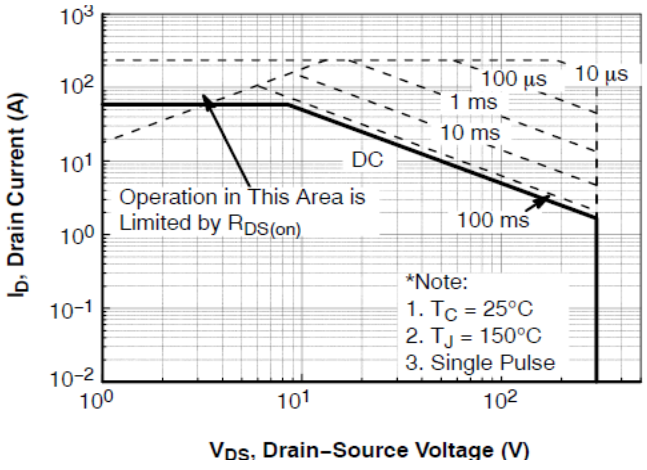


Fig 11. Safe Operating Area

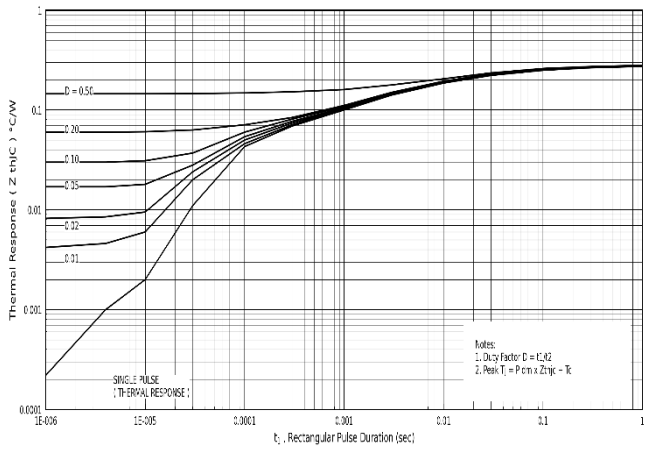
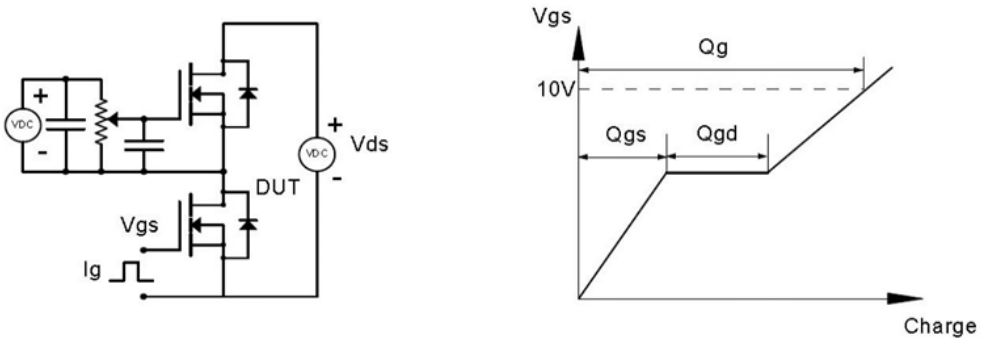
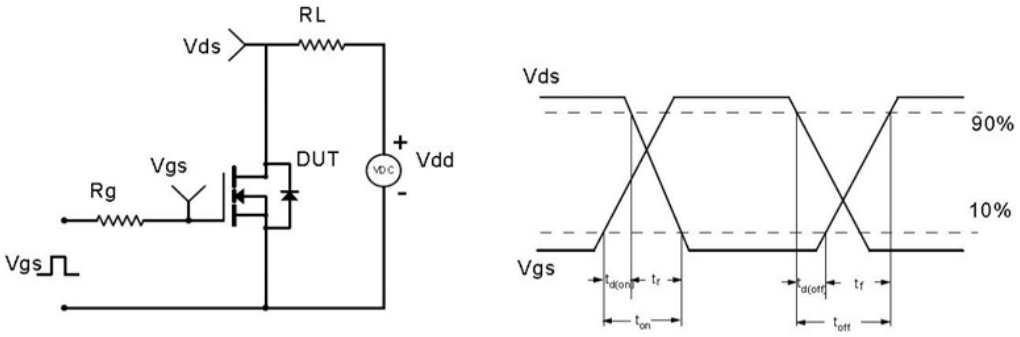


Fig 12. Transient Thermal Response Curve

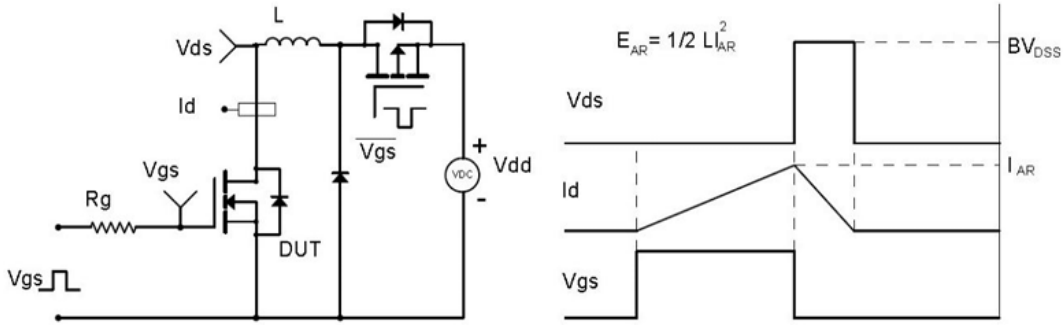
Test Circuit & Waveform



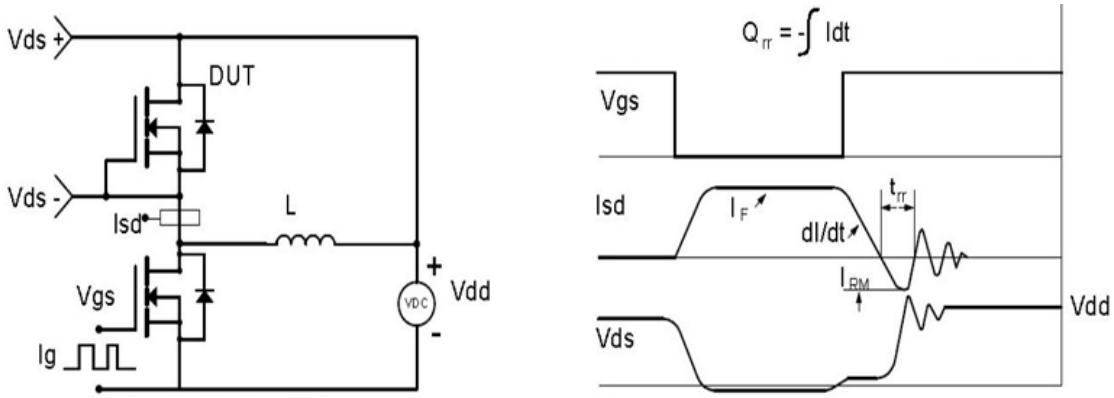
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

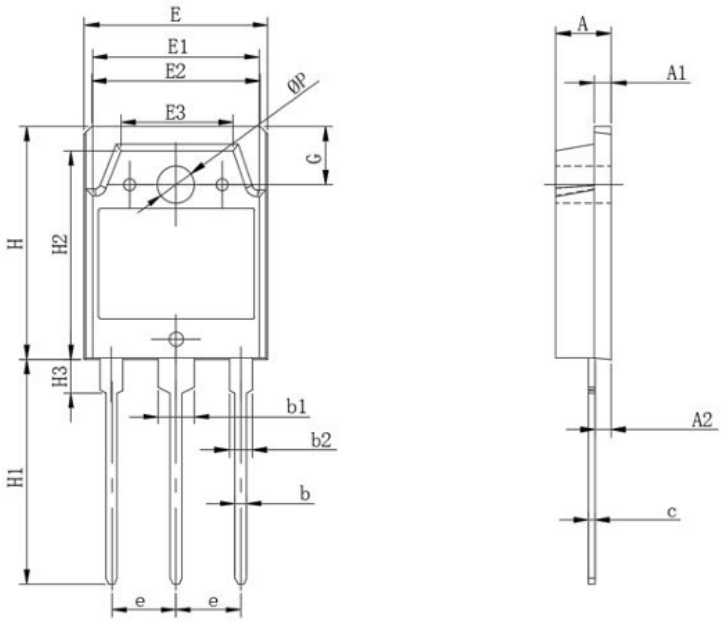


Unclamped Inductive Switching (UIS) Test Circuit & Waveforms



Diode Recovery Test Circuit & Waveforms

Package Information



基本尺寸

Symbol	单位 mm		
	Min	Nom	Max
A	4.60	4.80	5.00
A1	1.3	1.5	1.7
A2	1.20	1.40	1.60
b	0.80	1.0	1.20
b1	2.90	3.10	3.30
b2	1.90	2.10	2.30
c	0.50	0.60	0.70
e	5.25	5.45	5.65
E	15.2	15.6	16.0
E1	13.2	13.4	13.6
E2	13.1	13.3	13.5
E3	9.1	9.3	9.5
H	19.8	20.0	20.2
H1	20.1	20.3	20.5
H2	18.5	18.7	18.9
H3	3.2	3.5	3.8
G	4.8	5.0	5.2
ΦP	3.00	3.20	3.40

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