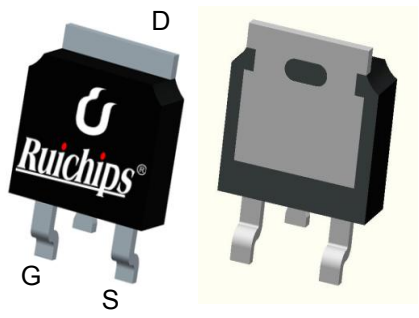
RUH40130L

N-Channel Advanced Power MOSFET

Features

- 40V/130A,
$R_{DS\ (ON)}$ =2.1mΩ(Typ.)@V_{GS}=10V
$R_{DS\ (ON)}$ =2.9mΩ(Typ.)@V_{GS}=4.5V
- Low On-Resistance
- 100% avalanche tested
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Pin Description



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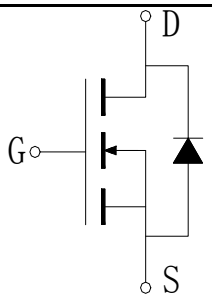


N-Channel MOSFET

Applications

- DC/DC Converters
- On board power for server
- Fast Charge

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		40	V
V_{GSS}	Gate-Source Voltage		±20	
T_J	Maximum Junction Temperature		175	°C
T_{STG}	Storage Temperature Range		-55 to 175	°C
I_S	Diode Continuous Forward Current	T_C=25°C	60	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	520	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	130	A
		T_C=100°C	92	
P_D	Maximum Power Dissipation	T_C=25°C	125	W
		T_C=100°C	62.5	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		1.2	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		100	°C/W
Drain-Source Avalanche Ratings				
E_{AS} ③	Avalanche Energy, Single Pulsed		306	mJ

Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RUH40130L			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	40			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=40V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	1		3	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ④	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=60A		2.1	2.5	mΩ
		V_{GS}=4.5V, I_{DS}=45A		2.9	3.5	mΩ
Diode Characteristics						
V_{SD} ④	Diode Forward Voltage	I_{SD}=60A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=60A, dI_{SD}/dt=100A/μs		11		ns
Q_{rr}	Reverse Recovery Charge			17		nC
Dynamic Characteristics ⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.1		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, Frequency=1.0MHz		2750		pF
C_{oss}	Output Capacitance			1150		
C_{rss}	Reverse Transfer Capacitance			79		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V,I_{DS}=60A, V_{GEN}=10V,R_G=0.5Ω		11		ns
t_r	Turn-on Rise Time			21		
$t_{d(OFF)}$	Turn-off Delay Time			59		
t_f	Turn-off Fall Time			14		
Gate Charge Characteristics ⑤						
Q_g	Total Gate Charge	V_{DS}=32V, V_{GS}=10V, I_{DS}=60A		43		nC
Q_{gs}	Gate-Source Charge			9		
Q_{gd}	Gate-Drain Charge			17		

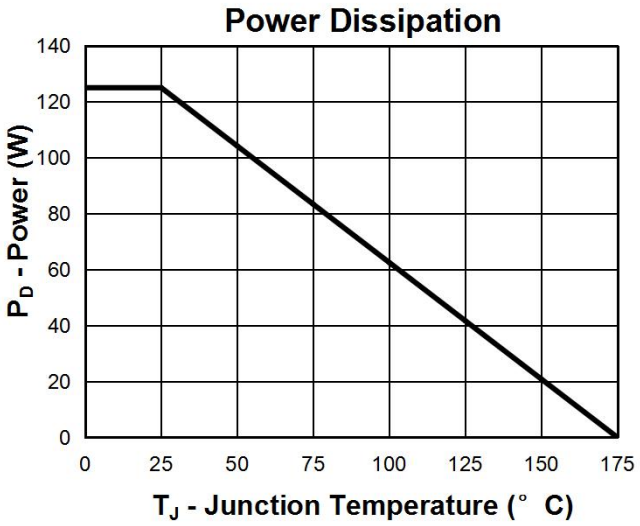
Notes:

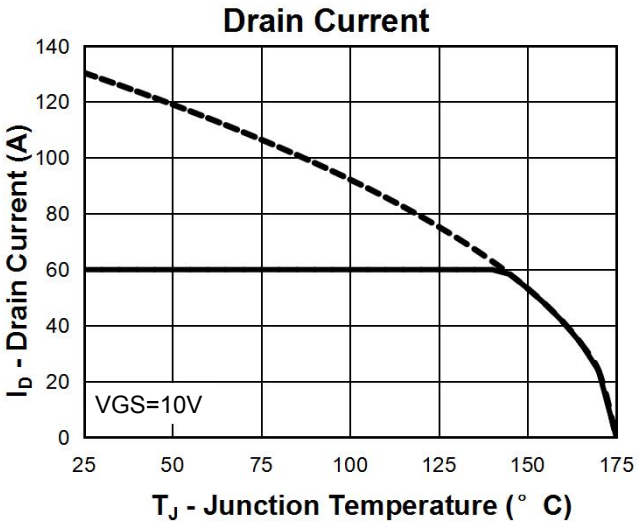
①Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 60A.
②Pulse width limited by safe operating area.
③Limited by TJmax, IAS =35A, VDD = 32V, RG = 50Ω , Starting TJ = 25° C.
④Pulse test ; Pulse width300s, duty cycle2%.
⑤Guaranteed by design, not subject to production testing.

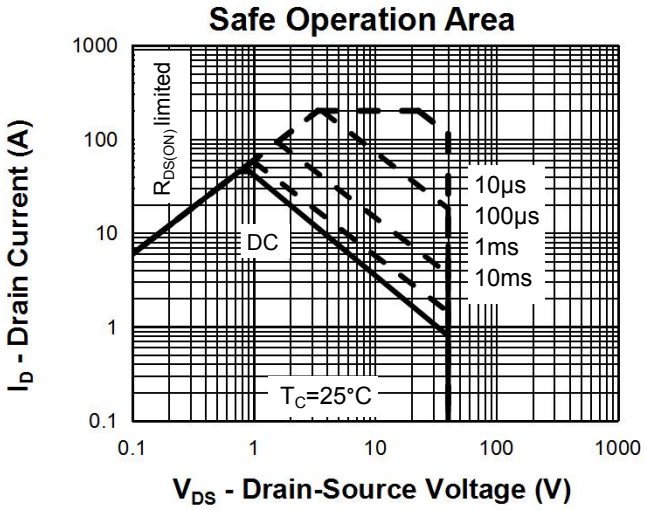
Ordering and Marking Information

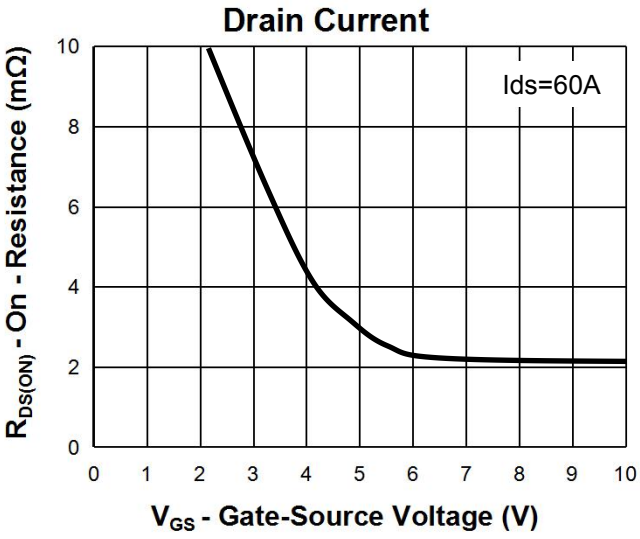
Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RUH40130L	RUH40130L	TO252	Tape&Reel	2500	13"	16mm

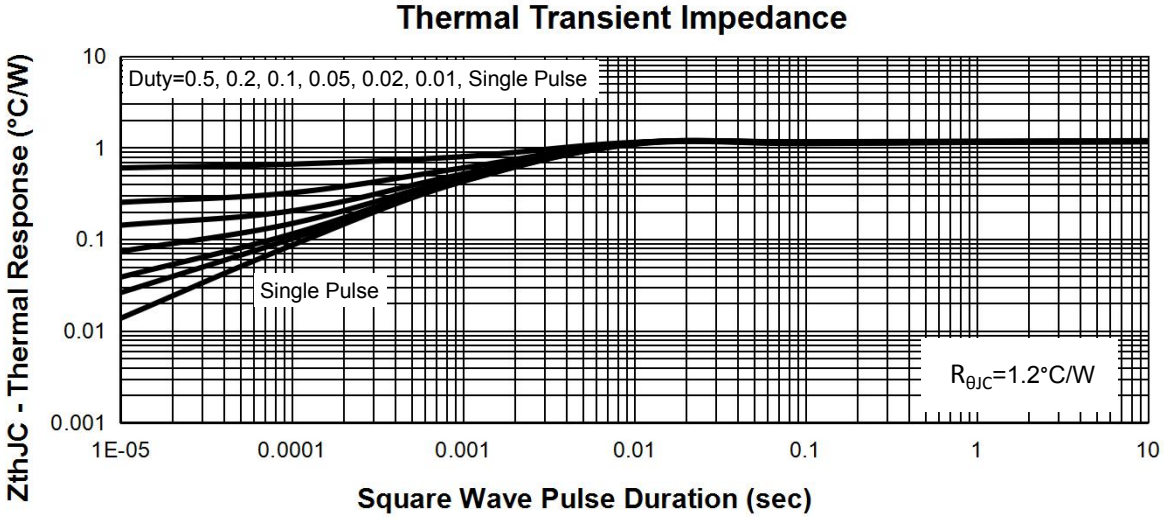
Typical Characteristics



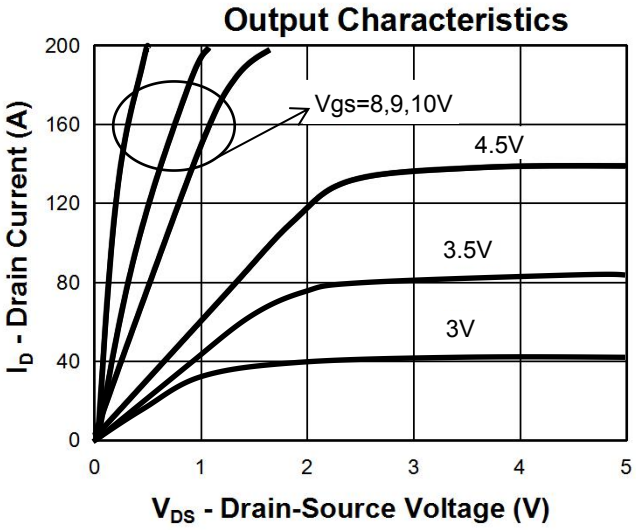


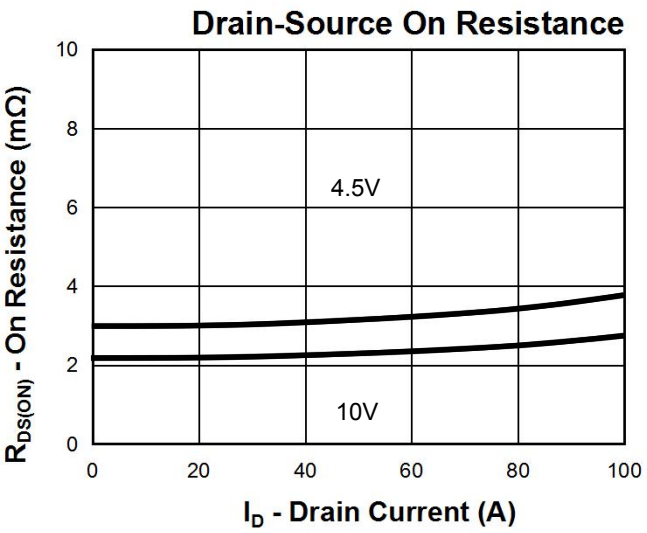


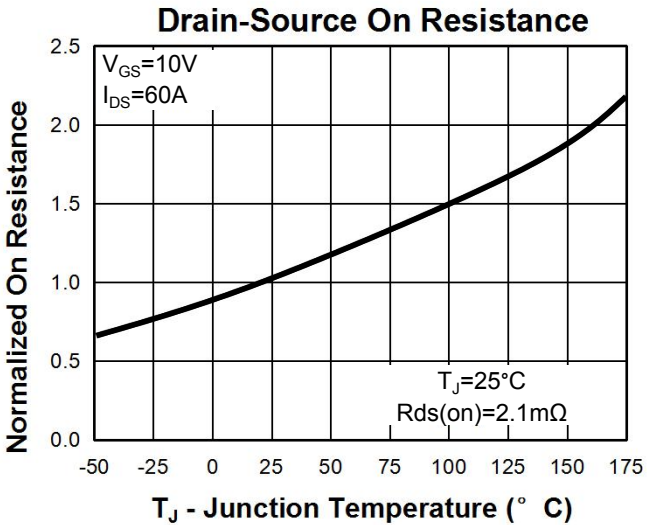


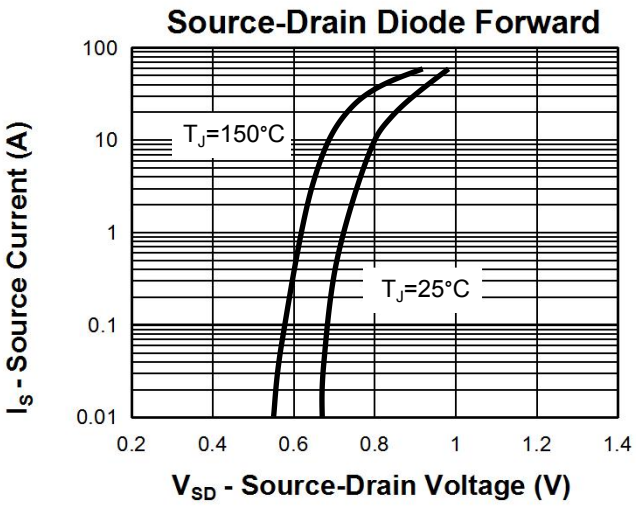


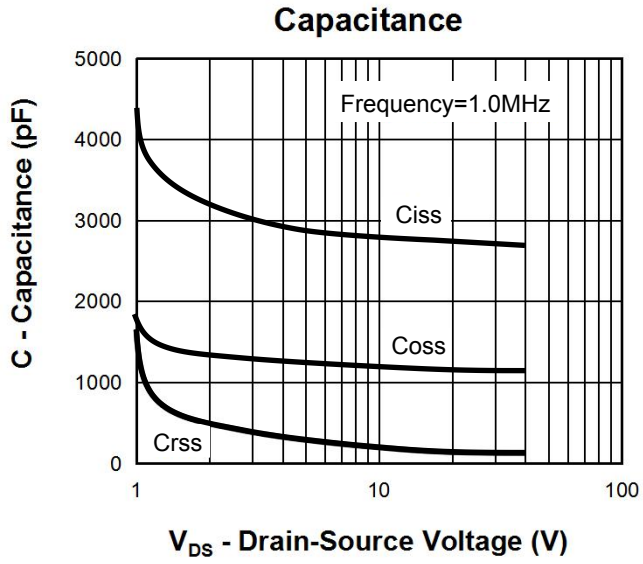
Typical Characteristics

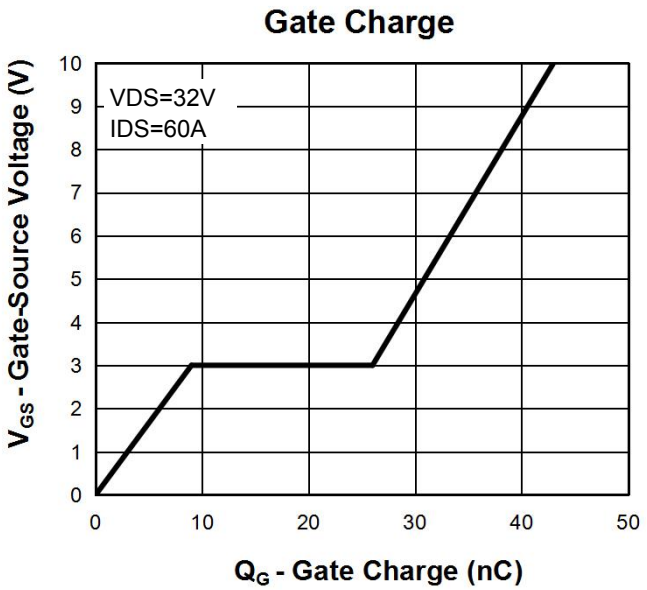




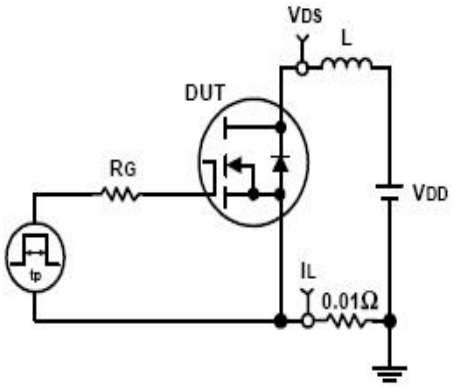


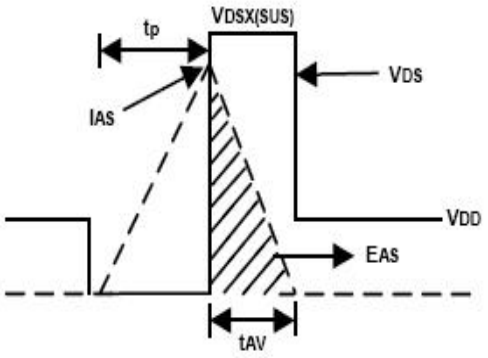




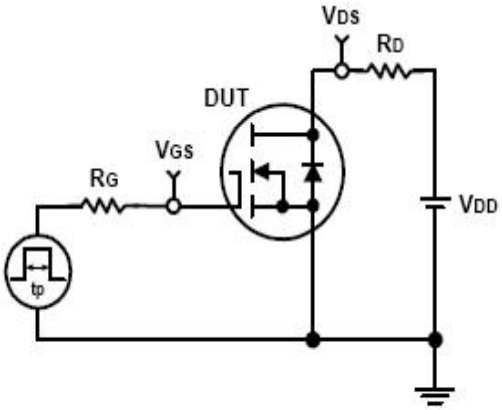


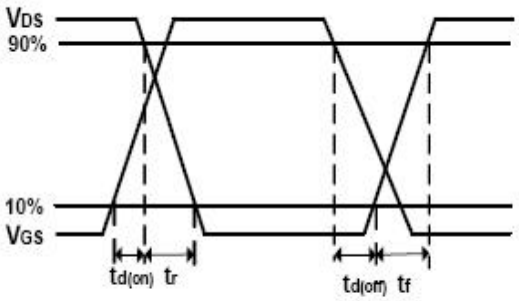
Avalanche Test Circuit and Waveforms





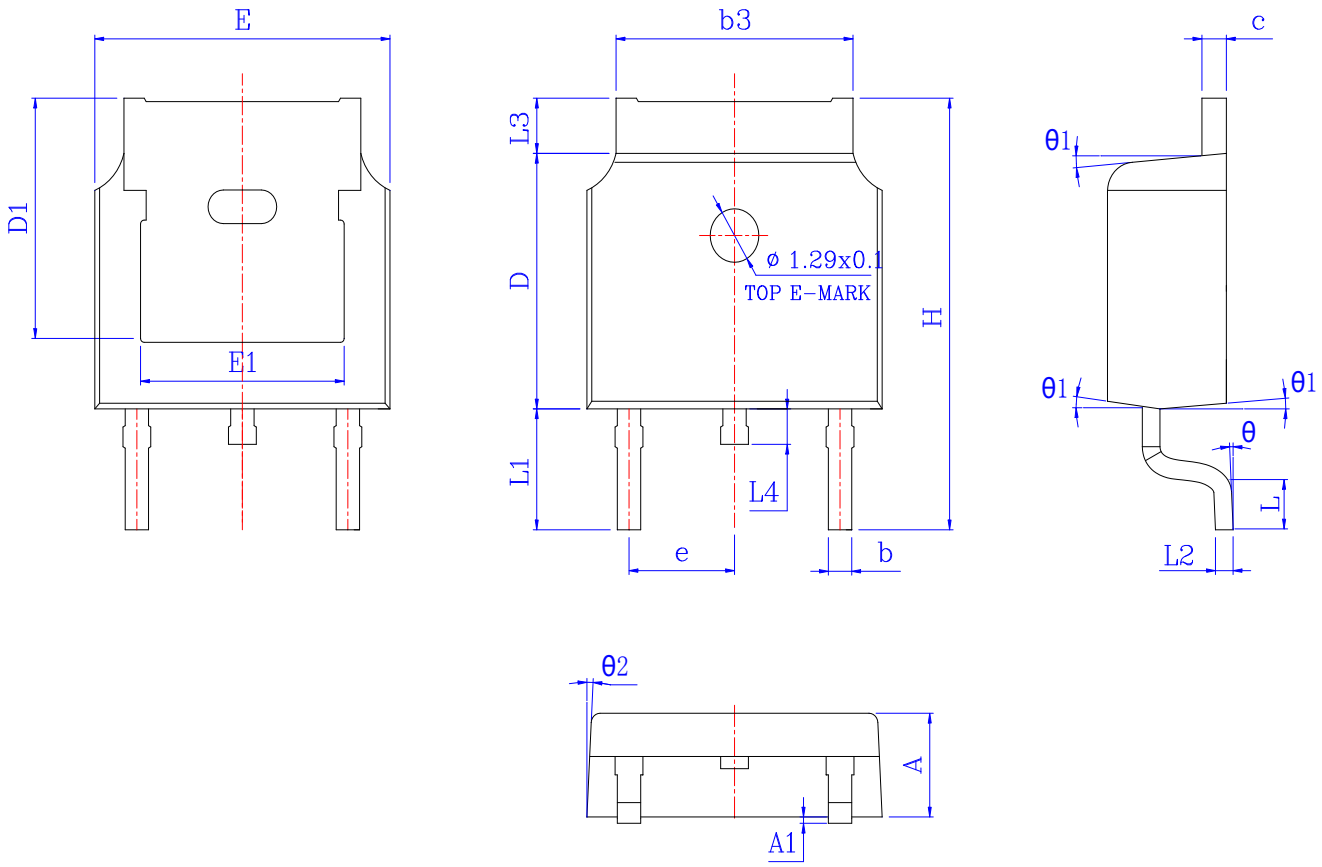
Switching Time Test Circuit and Waveforms





Package Information

TO252



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.200	2.300	2.400	0.087	0.091	0.094
A1	*	*	0.100	*	*	0.004
b	0.660	0.760	0.860	0.026	0.030	0.034
b3	5.130	5.295	5.460	0.202	0.208	0.215
c	0.470	0.535	0.600	0.019	0.021	0.024
D	6.000	6.100	6.200	0.236	0.240	0.244
D1		5.30 REF			0.20 REF	
E	6.500	6.600	6.700	0.256	0.260	0.264
E1	4.700	4.810	4.920	0.185	0.189	0.194
e		2.28 REF			0.09 REF	
H	9.800	10.100	10.400	0.386	0.398	0.409
L	1.400	1.550	1.700	0.055	0.061	0.067
L1		2.743 REF			0.108 REF	
L2		0.510 BSC			0.020 BSC	
L3	0.900	1.075	1.250	0.035	0.042	0.049
L4	0.600	0.800	1.000	0.024	0.031	0.039
θ	0°	*	8°	0°	*	8°
θ 1	5°	7°	9°	5°	7°	9°
θ 2	5°	7°	9°	5°	7°	9°

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