RUH120N35L

N-Channel Advanced Power MOSFET

Features

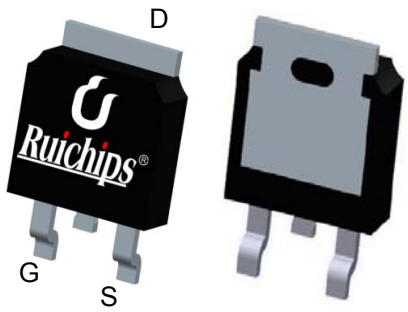
• 120V/35A,
$R_{DS\ (ON)}$ =28mΩ(Typ.)@V_{GS}=10V
• Uses Ruichips advanced RUISGT™ Technology
• Super High Dense Cell Design
• 100% avalanche tested
• Fast Switching Speed
• Qualified according to JEDEC criteria
• Lead Free and Green Devices Available (RoHS Compliant)

Pb-Free RoHS Halogen-Free

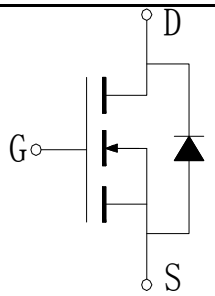
Applications

• Atomizer
• Switch Systems
• Synchronous rectification
• On board power for server

Pin Description



TO252



N-Channel MOSFET

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		120	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	20	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	120	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	35	A
		T_C=100°C	25	
P_D	Maximum Power Dissipation	T_C=25°C	38	W
		T_C=100°C	19	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		4	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		100	°C/W
Drain-Source Avalanche Ratings				
E_{AS} ④	Avalanche Energy, Single Pulsed		56	mJ

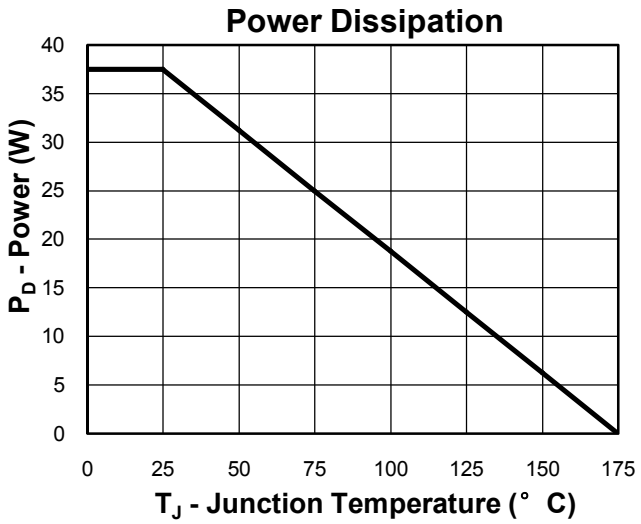
Electrical Characteristics (T_C=25°C Unless Otherwise Noted)

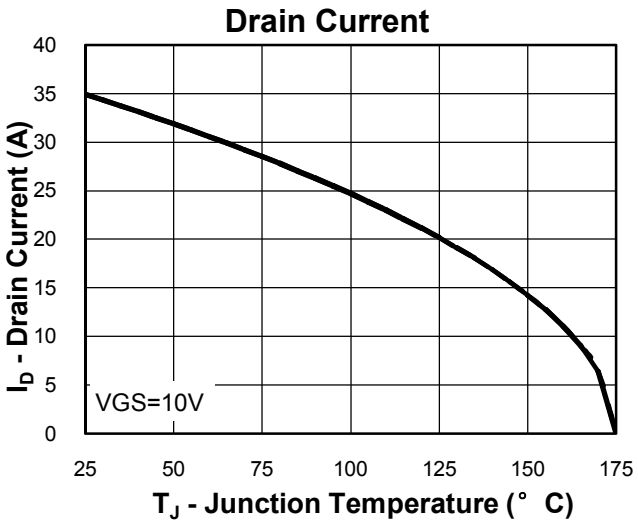
Symbol	Parameter	Test Condition	RUH120N35L			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	120			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=120V, V_{GS}=0V			1	μA
		T_J=125°C			30	
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_{DS}=250μA	2		4	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V			±100	nA
$R_{DS(ON)}$ ③	Drain-Source On-state Resistance	V_{GS}=10V, I_{DS}=20A		28	40	mΩ
Diode Characteristics						
V_{SD} ③	Diode Forward Voltage	I_{SD}=20A, V_{GS}=0V			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=35A, dI_{SD}/dt=100A/μs		19		ns
Q_{rr}	Reverse Recovery Charge			11		nC
Dynamic Characteristics ⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		1.7		Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=60V, Frequency=1.0MHz		890		pF
C_{oss}	Output Capacitance			103		
C_{rss}	Reverse Transfer Capacitance			6		
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=60V,I_{DS}=35A, V_{GEN}=10V,R_G=1.7Ω		5		ns
t_r	Turn-on Rise Time			31		
$t_{d(OFF)}$	Turn-off Delay Time			14		
t_f	Turn-off Fall Time			7		
Gate Charge Characteristics ⑤						
Q_g	Total Gate Charge	V_{DS}=96V, V_{GS}=10V, I_{DS}=35A		16		nC
Q_{gs}	Gate-Source Charge			5		
Q_{gd}	Gate-Drain Charge			3.5		

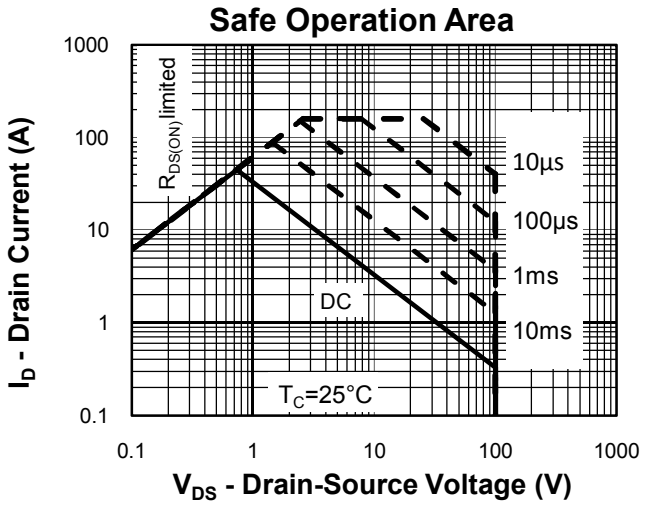
Notes:

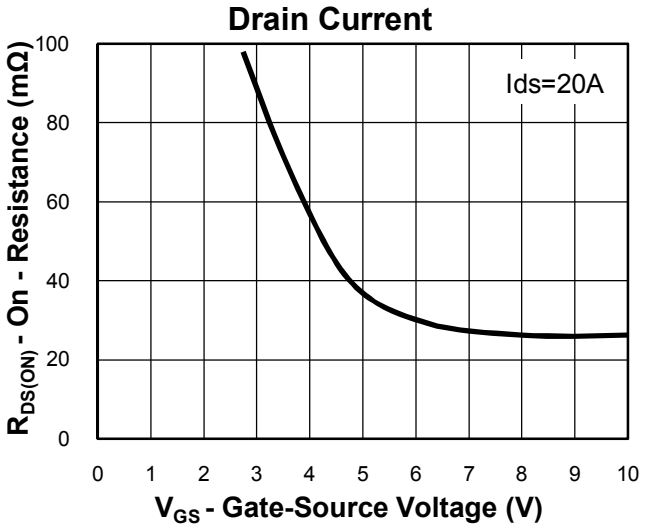
①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature.
③When mounted on 1 inch square copper board, t≤10sec.
④Limited by TJmax, IAS =15A, VDD = 48V, RG = 50Ω, Starting TJ = 25° C.
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑥Guaranteed by design, not subject to production testing.

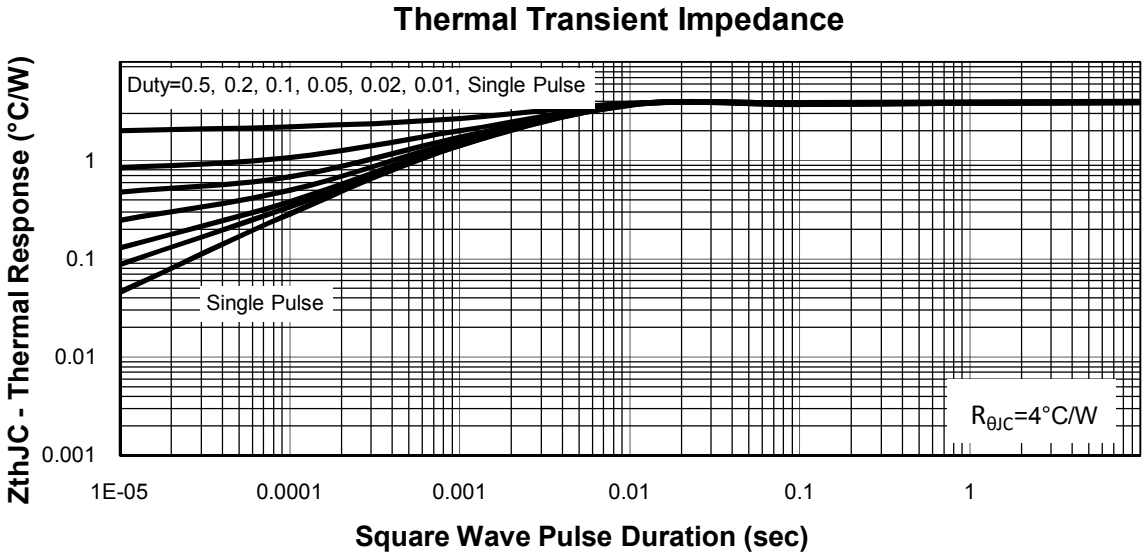
Typical Characteristics











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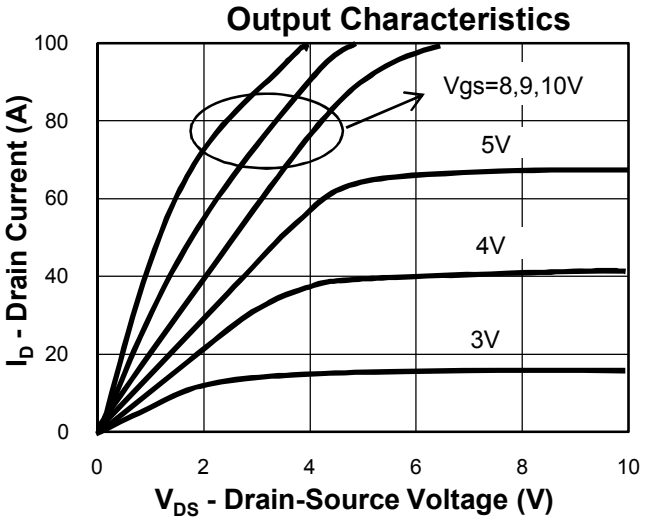
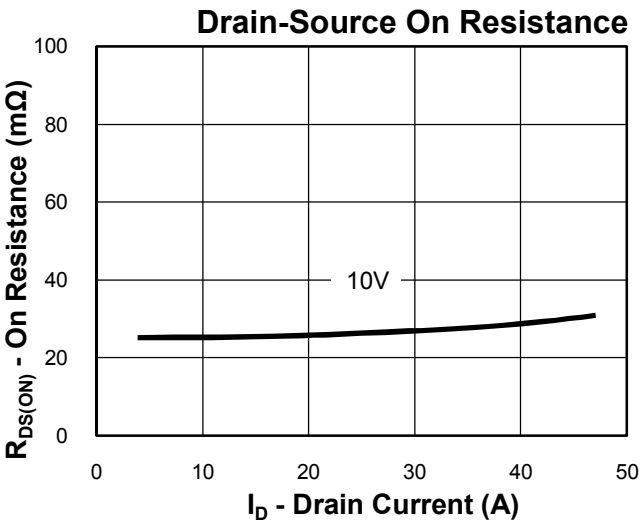
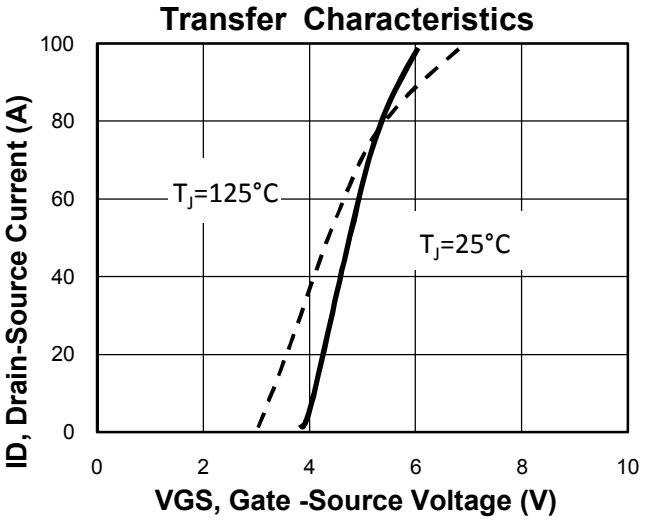
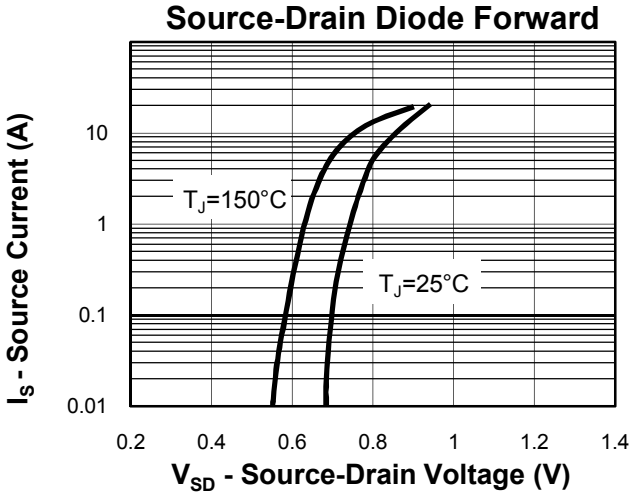
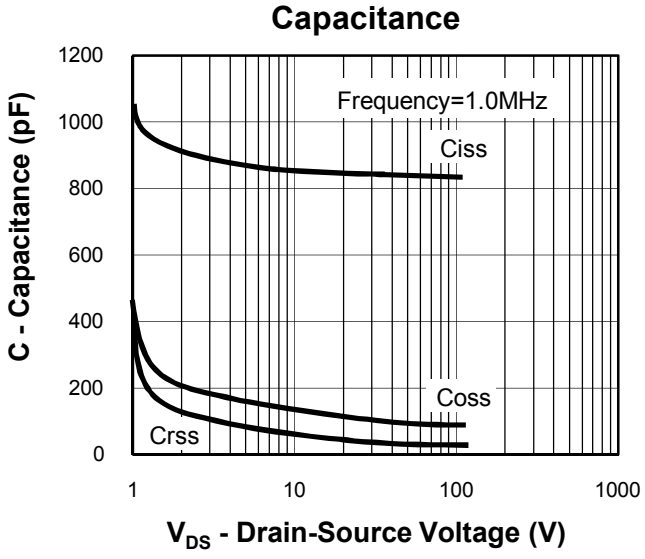
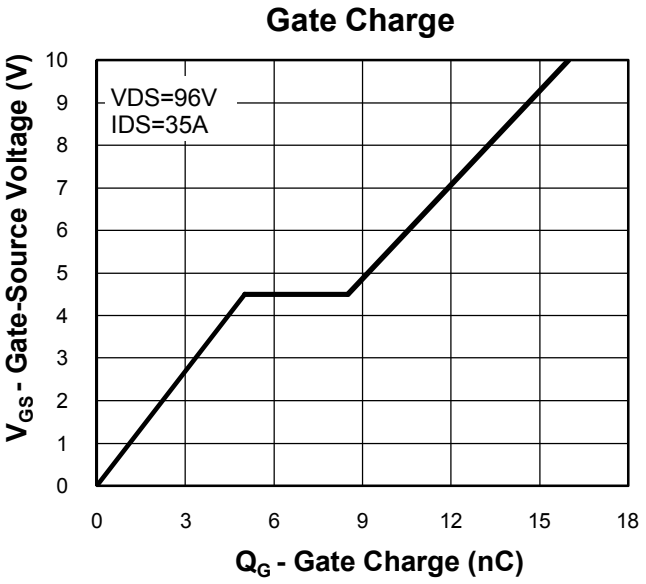




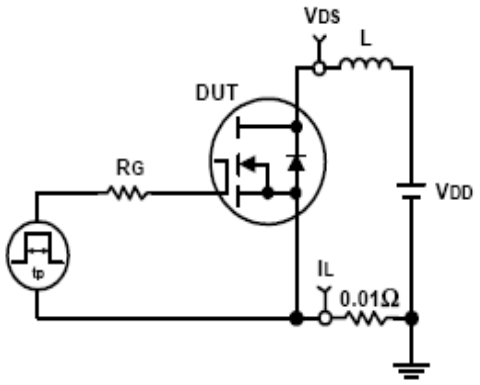


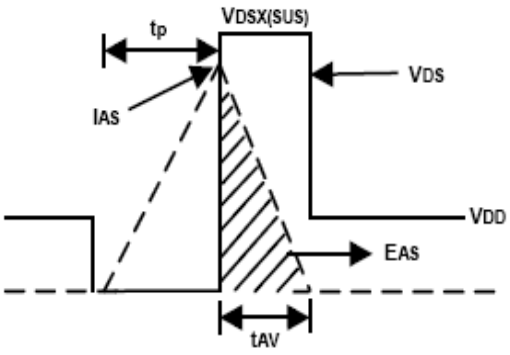




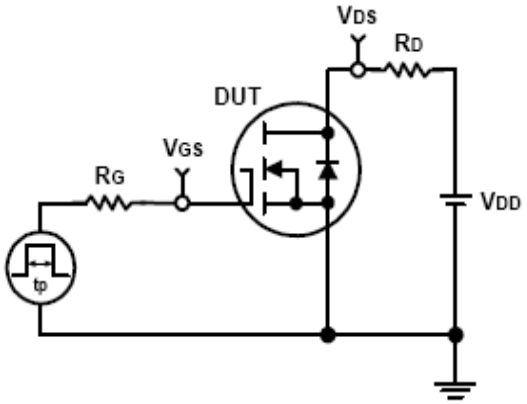


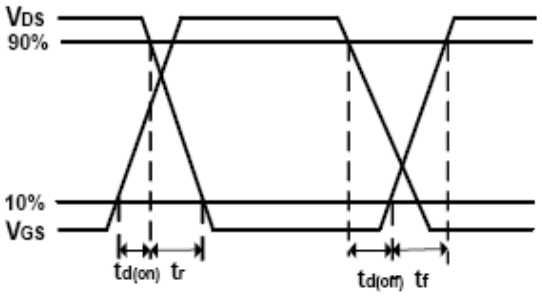
Avalanche Test Circuit and Waveforms





Switching Time Test Circuit and Waveforms



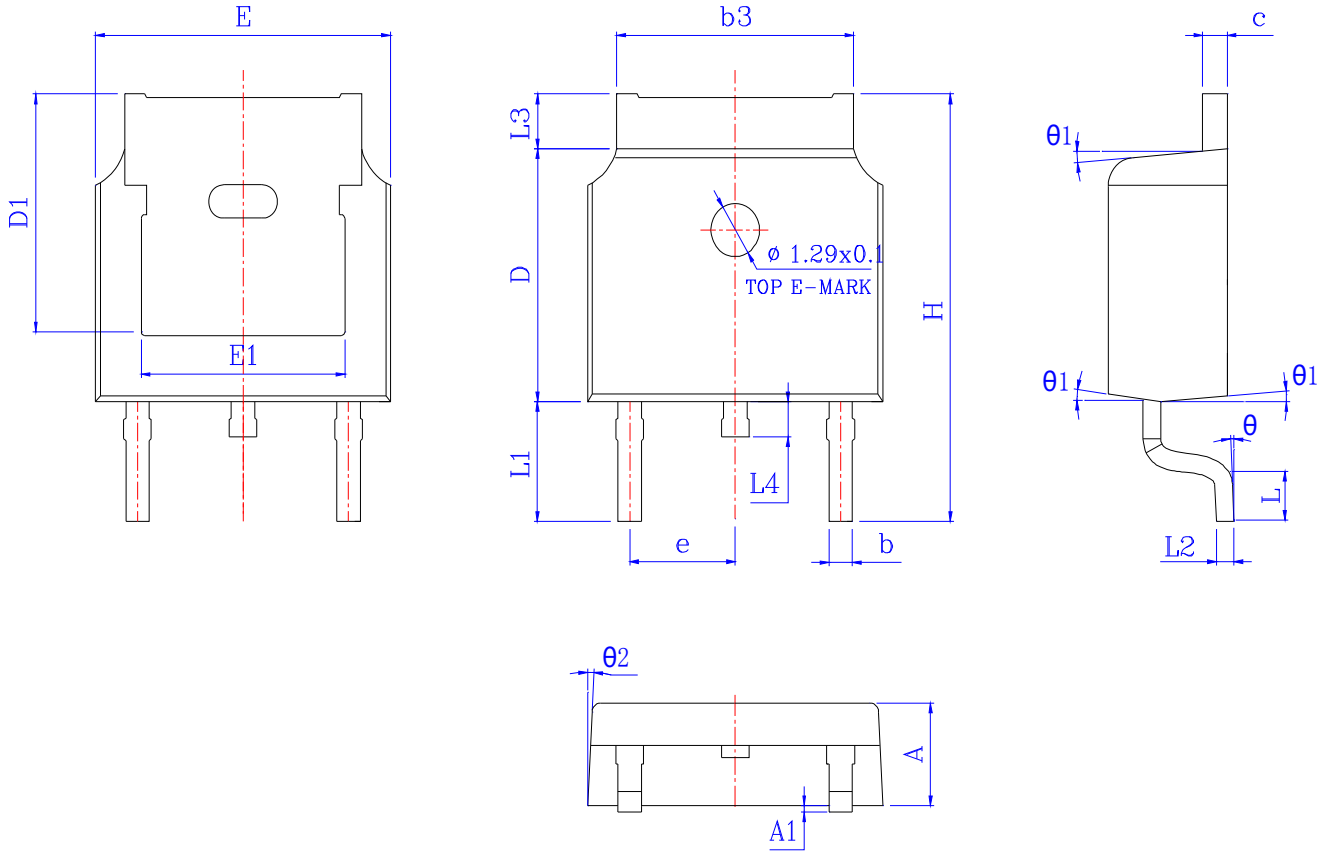


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape width
RUH120N35L	RUH120N35L	TO252	Tape&Reel	2500	13"	16mm

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	5.315	5.500	0.202	0.209	0.217
c	0.450	0.525	0.600	0.018	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	6.650	6.800	0.256	0.262	0.268
E1	4.700	4.810	4.920	0.185	0.189	0.194
e	2.28 REF			0.09 REF		
H	9.400	9.900	10.400	0.370	0.390	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°
θ1	5°	7°	9°	5°	7°	9°
θ2	5°	7°	9°	5°	7°	9°