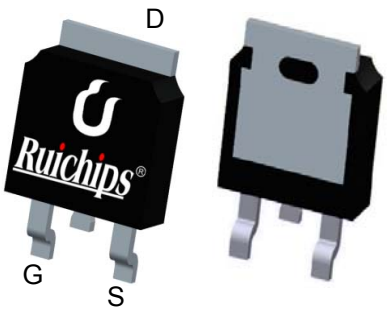
RUH60120L

N-Channel Advanced Power MOSFET

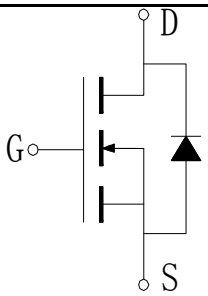
Features

- 60V/120A,
  $R_{DS\ (ON)}$ =3.2mΩ(Typ.)@V_{GS}=10V
  $R_{DS\ (ON)}$ =3.6mΩ(Typ.)@V_{GS}=4.5V
- Uses Ruichips Advanced RUISGT™ Technology
- Ultra Low On-Resistance
- Excellent Q_gx$R_{DS(on)}$ Product
- 100% Avalanche Tested
- 175°C Operating Temperature
- Lead Free and Green Devices (RoHS Compliant)

Pin Description



TO252



N-Channel MOSFET

Applications

- DC-DC Converters and Off-line UPS
- Motor Drives
- Uninterruptible Power Supplies
- DC/DC Converter
- General Purpose Application

Pb-Free RoHS Halogen-Free

Absolute Maximum Ratings

Symbol	Parameter		Rating	Unit
Common Ratings (T_C=25°C Unless Otherwise Noted)				
V_{DSS}	Drain-Source Voltage		60	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	120	A
Mounted on Large Heat Sink				
I_{DP} ①	300μs Pulse Drain Current Tested	T_C=25°C	480	A
I_D ②	Continuous Drain Current(V_{GS}=10V)	T_C=25°C	120	A
		T_C=100°C	84	
P_D	Maximum Power Dissipation	T_C=25°C	202	W
		T_C=100°C	101	
$R_{\theta JC}$	Thermal Resistance-Junction to Case		0.74	°C/W
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient		48	°C/W
Drain-Source Avalanche Ratings				
E_{AS} ③	Avalanche Energy, Single Pulsed		380	mJ

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

Symbol	Parameter	Test Condition	RUH60120L			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_{DS}=250μA	60			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, 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		3.2	4	mΩ
		V_{GS}=4.5V, I_{DS}=40A		3.6	5.5	mΩ
Diode Characteristics						
V_{SD}④	Diode Forward Voltage	I_{SD}=60A, V_{GS}=0V		0.9	1.2	V
t_{rr}	Reverse Recovery Time	I_{SD}=60A, dI_{SD}/dt=100A/μs		59	80	ns
Q_{rr}	Reverse Recovery Charge			37	50	nC
Dynamic Characteristics⑤						
R_G	Gate Resistance	V_{GS}=0V,V_{DS}=0V,F=1MHz		2.9	4	Ω
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, Frequency=1.0MHz		3030	3600	pF
C_{oss}	Output Capacitance			735	1000	
C_{rss}	Reverse Transfer Capacitance			15	20	
$t_{d(ON)}$	Turn-on Delay Time	V_{DD}=20V,I_{DS}=60A, V_{GEN}=10V,R_G=0.5Ω		9	15	ns
t_r	Turn-on Rise Time			49	70	
$t_{d(OFF)}$	Turn-off Delay Time			21	30	
t_f	Turn-off Fall Time			17	30	
Gate Charge Characteristics⑤						
Q_g	Total Gate Charge	V_{DS}=32V, V_{GS}=10V, I_{DS}=60A		54	70	nC
Q_{gs}	Gate-Source Charge			9	20	
Q_{gd}	Gate-Drain Charge			11	20	

Notes:

①Pulse width limited by safe operating area.

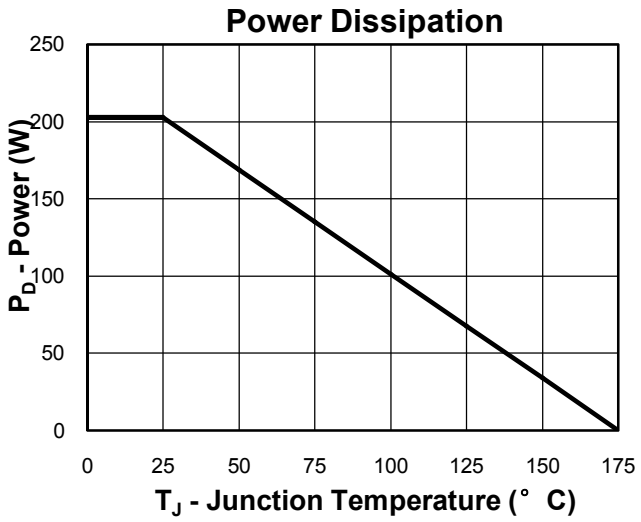
②Calculated continuous current based on maximum allowable junction temperature. The package limitation current is 60A.

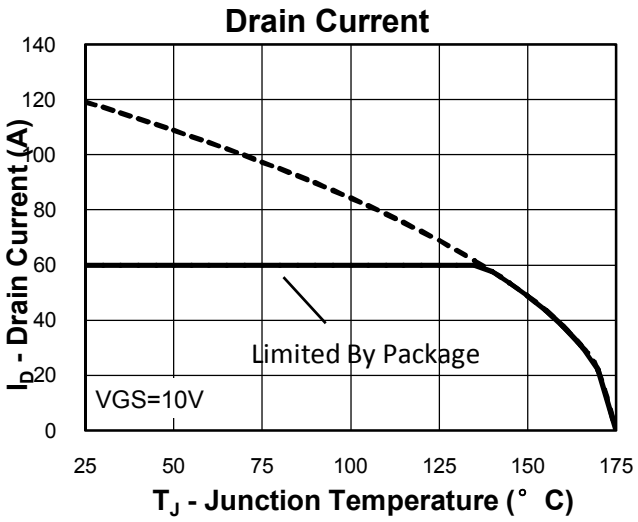
③This value is based on starting TJ = 25° C, L = 0.5mH, RG = 50Ω, IAS = 40A, VDD =48V; 100% FT tested at L = 0.5mH, IAS = 26A.

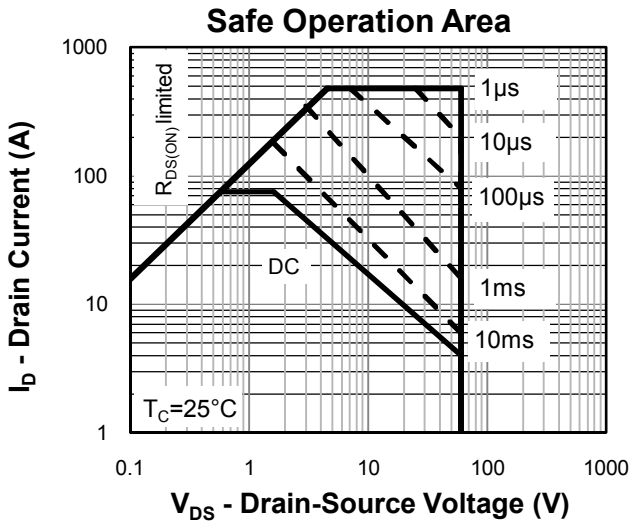
④Pulse test;Pulse width≤300μs, duty cycle≤2%.

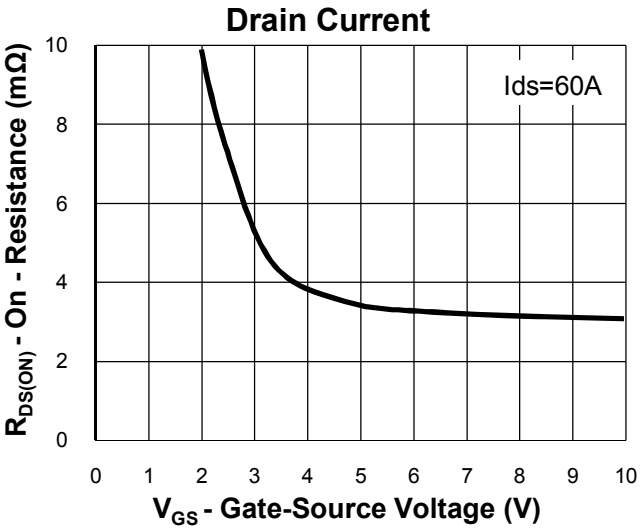
⑤Guaranteed by design, not subject to production testing.

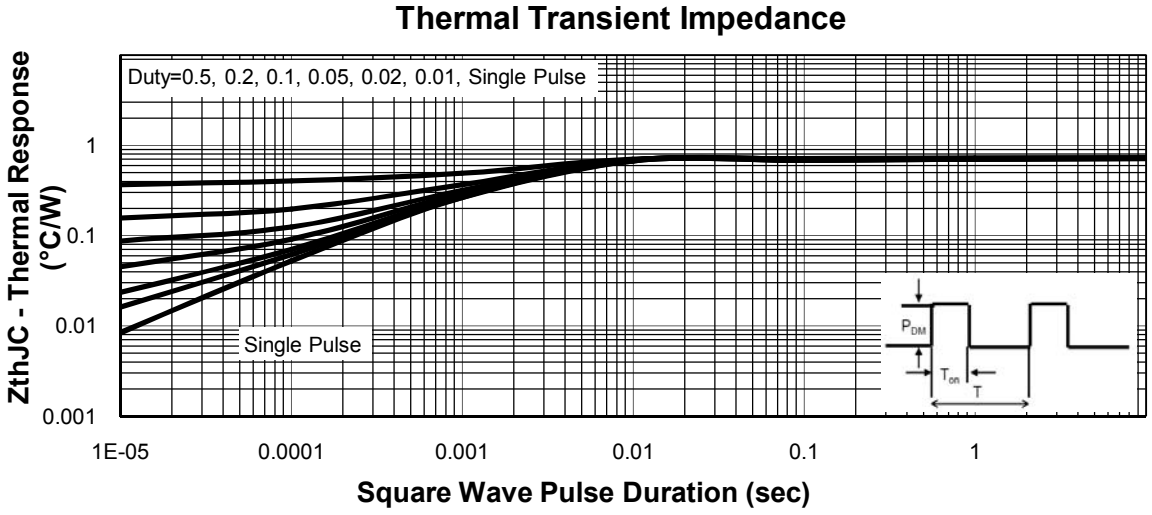
Typical Characteristics





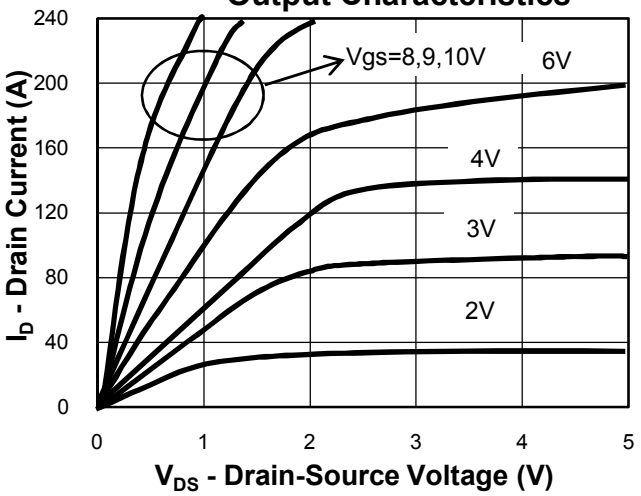




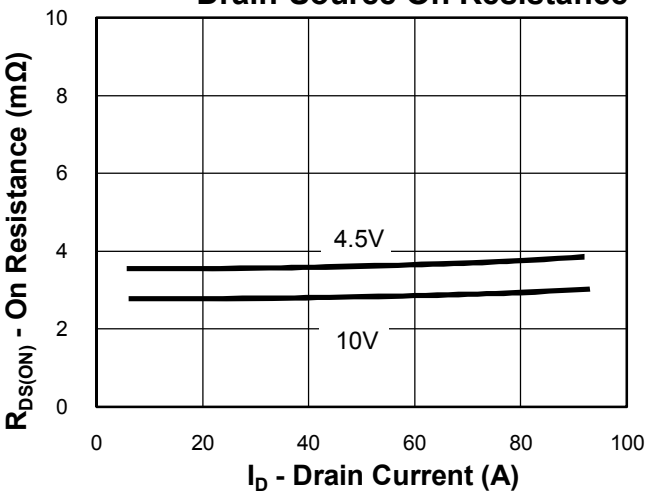


Typical Characteristics

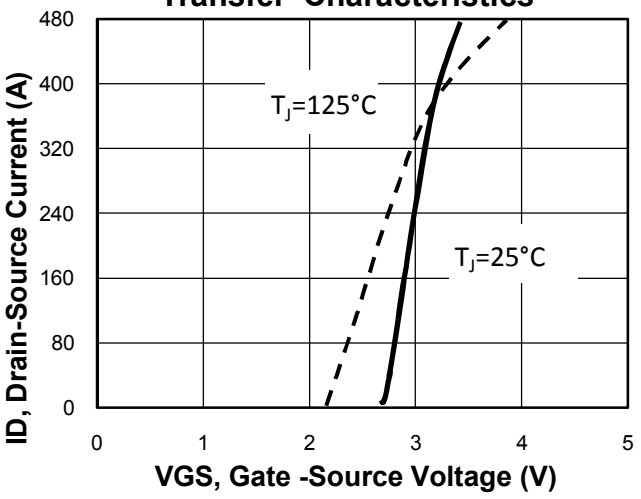
Output Characteristics



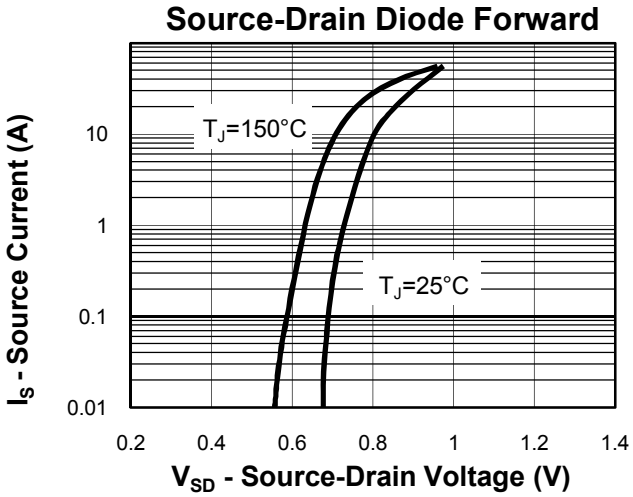
Drain-Source On Resistance



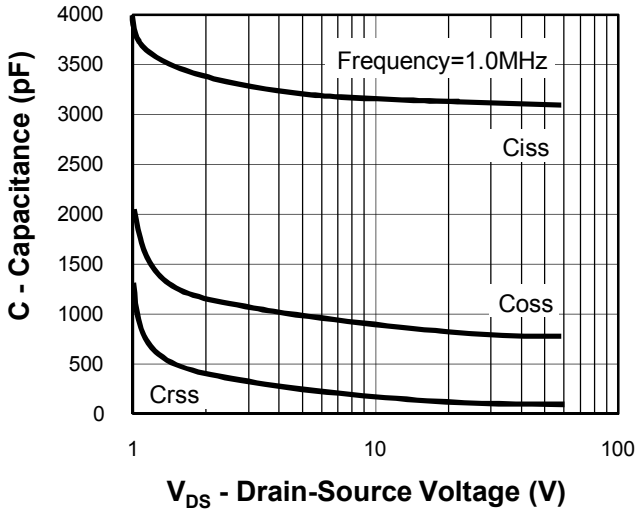
Transfer Characteristics



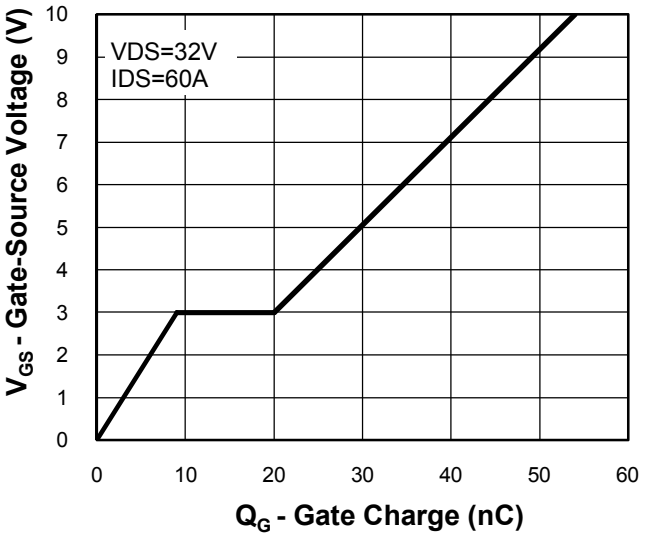
Source-Drain Diode Forward



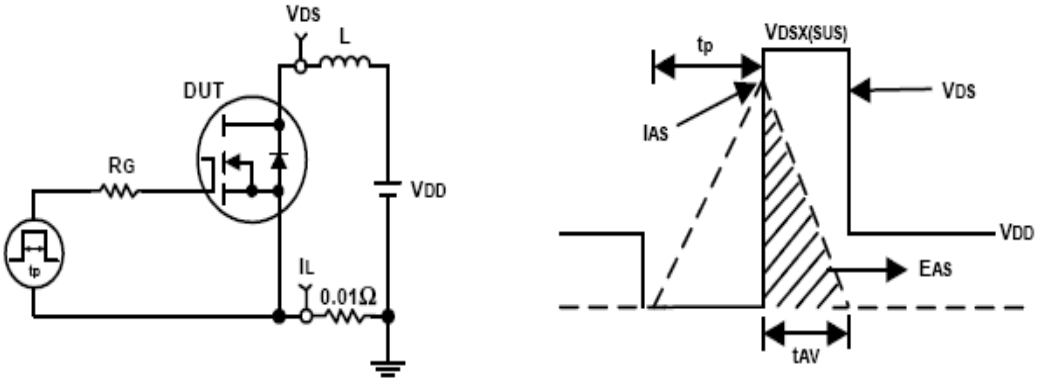
Capacitance



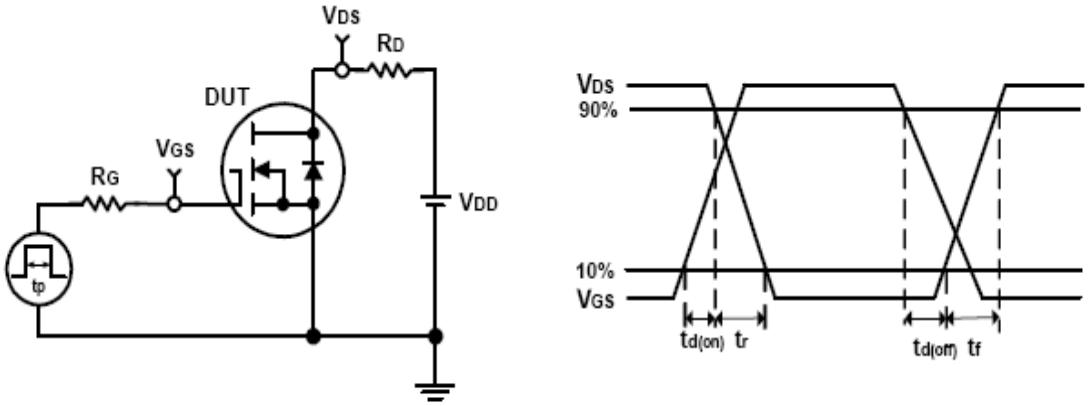
Gate Charge



Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms

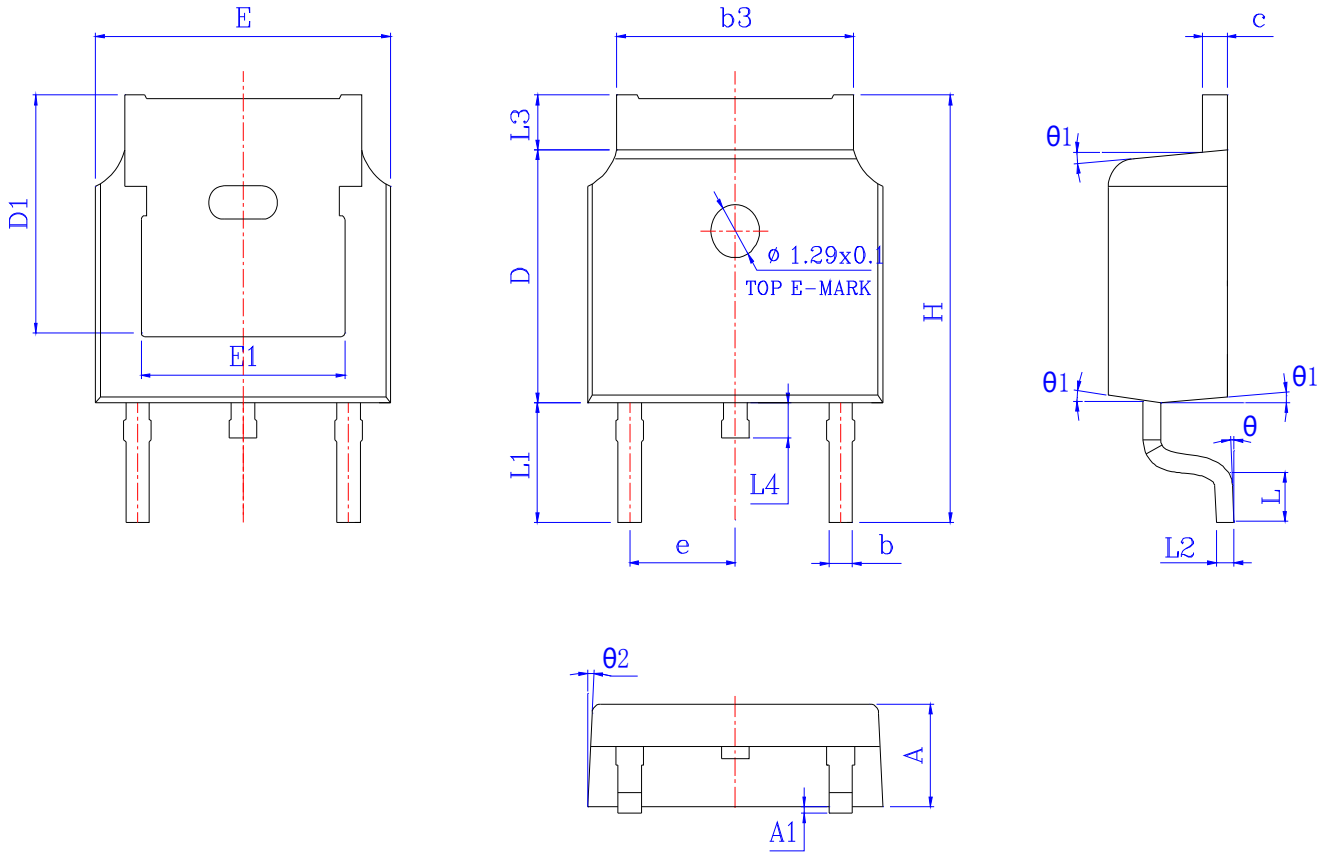


Ordering and Marking Information

Device	Marking	Package	Packaging	Quantity	Reel Size	Tape
RUH60120L	RUH60120L	TO252	Tape&Reel	2500	13"	16mm

Package Information

TO252



SYMBOL	MM			INCH		
	MIN	NOM	MAX	MIN	NOM	MAX
A	2.200	2.290	2.400	0.087	0.090	0.094
A1	0.000		0.100	0.000		0.004
b	0.660	0.785	0.860	0.026	0.031	0.034
b3	5.130	5.365	5.500	0.202	0.211	0.217
c	0.450	0.515	0.600	0.018	0.020	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	9.850	10.400	0.370	0.388	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°