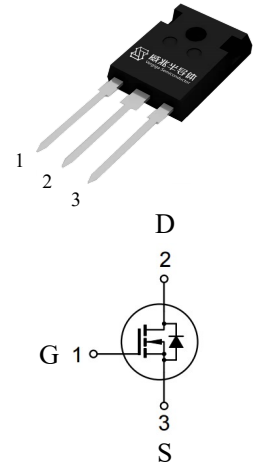


Features

- High speed switching with low on-resistance
- Very low switching losses
- Controllable dv/dt
- Avalanche Ruggedness and 100% Avalanche test
- Robust body diode

V_{DS}	1200	V
$R_{DS(on),TYP}@25^{\circ}C$	80	mΩ
I_D	36	A

TO-247



Part ID	Package Type	Marking	Packing
HCCW120R080H1	TO-247	120R080H1	30pcs/Pipe

Maximum ratings, at $T_A = 25^{\circ}C$, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		1200	V
$V_{GS_{MAX}}$	Gate-Source voltage		-10~+25	V
$V_{GS_{OP}}$	Gate-Source voltage		-5~+20	V
I_D	Continuous drain current @ $V_{GS}=20V$ (Silicon limited)	$T_C = 25^{\circ}C$	36	A
I_D	Continuous drain current @ $V_{GS}=20V$ (Silicon limited)	$T_C = 100^{\circ}C$	24	A
I_{DM}	Pulse drain current tested	$T_C = 25^{\circ}C$	80	A
EAS	Avalanche energy, single pulsed		1200	mJ
PD	Maximum power dissipation	$T_C = 25^{\circ}C$	220	W
		$T_C = 110^{\circ}C$	95	W
$T_{STG,TJ}$	Storage and Junction Temperature Range		-55 to 175	$^{\circ}C$
TL	Solder Temperature		260	$^{\circ}C$
MD	Mounting Torque M3 screw		0.6	N.m

Thermal Characteristics

Symbol	Parameter	Typical	Max	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	—	0.68	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	—	40	$^{\circ}C/W$

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
V(BR)DSS	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =100μA	1200	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current(T _j =25°C)	V _{DS} =1200V, V _{GS} =0V	-	-	100	μA
	Zero Gate Voltage Drain Current(T _j =150°C)	V _{DS} =1200V, V _{GS} =0V	-	-	100	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =-10/+25V, V _{DS} =0V	-	-	±100	nA
g _{fs}	Transconductance	V _{DS} =20V, I _D =20A	-	8	-	S
V _{GS(th)}	Gate Threshold Voltage(T _j =25°C)	V _{DS} =V _{GS} , I _D =5mA	2.00	3.00	4.00	V
	Gate Threshold Voltage(T _j =150°C)	V _{DS} =V _{GS} , I _D =5mA	-	2.40	-	V
R _{DS(on)}	Drain-Source On-State Resistance (T _j =25°C)	V _{GS} =20V, I _D =20A	-	80.0	105	mΩ
	...(T _j =150°C)	V _{GS} =20V, I _D =20A	-	140	-	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C _{iss}	Input Capacitance	V _{DS} =800V, V _{GS} =0V, f=1MHz	-	1410	-	pF
C _{oss}	Output Capacitance		-	97	-	pF
C _{rss}	Reverse Transfer Capacitance		-	6.7	-	pF
R _g	Gate Resistance	f=1MHz	-	3.00	-	Ω
Q _g	Total Gate Charge	V _{DS} =800V, I _D =20A, V _{GS} =0/20V, T _{vj} =25°C	-	55.5	-	nC
Q _{gs}	Gate-Source Charge		-	17.6	-	nC
Q _{gd}	Gate-Drain Charge		-	25.8	-	nC
Switching Characteristics@ T_j = 25°C						
E _{tot}	Total switching energy	V _{DD} =800V, I _D =20A, R _G =5.1Ω, V _{GS} =0/20V	-	649	-	μJ
E _{on}	Turn-on energy		-	570	-	
E _{off}	Turn-off energy		-	79.0	-	
T _{d(on)}	Turn-on Delay Time		-	30.9	-	ns
T _r	Turn-on Rise Time		-	24.1	-	ns
T _{d(off)}	Turn-Off Delay Time		-	26.0	-	ns
T _f	Turn-Off Fall Time		-	15.6	-	ns
Switching Characteristics@ T_j = 150°C						

E_{tot}	Total switching energy	$V_{DD}=800V,$ $I_D=20A,$ $R_G=5.1\Omega,$ $V_{GS}=0/20V$	-	610	-	uJ
E_{on}	Turn-on energy		-	523	-	
E_{off}	Turn-off energy		-	87.0	-	
$T_{d(on)}$	Turn-on Delay Time		-	36.6	-	ns
T_r	Turn-on Rise Time		-	20.8	-	ns
$T_{d(off)}$	Turn-Off Delay Time		-	29.4	-	ns
T_f	Turn-Off Fall Time		-	17.7	-	ns

Source- Drain Diode Characteristics@ $T_j = 25^\circ C$ (unless otherwise stated)

V_{SD}	Forward on voltage	$I_{SD}=10A, V_{GS}=0V$	-	3.55	4.15	V
I_{rrm}	Diode peak reverse recovery current	$V_{dd}=800V, I_{sd}=20A,$ $V_{GS}=0/20V, T_{vj}=25^\circ C$	-	7.97	-	A
T_{rr}	Reverse Recovery Time		-	35.8	-	ns
Q_{rr}	Reverse Recovery Charge		-	160	-	nC

Source- Drain Diode Characteristics@ $T_j = 150^\circ C$ (unless otherwise stated)

V_{SD}	Forward on voltage	$I_{SD}=10A, V_{GS}=0V$	-	3.15	-	V
I_{rrm}	Diode peak reverse recovery current	$V_{dd}=800V, I_{sd}=20A,$ $V_{GS}=0/20V, T_{vj}=150^\circ C$	-	13.5	-	A
T_{rr}	Reverse Recovery Time		-	51.1	-	ns
Q_{rr}	Reverse Recovery Charge		-	367	-	nC

Typical Characteristics

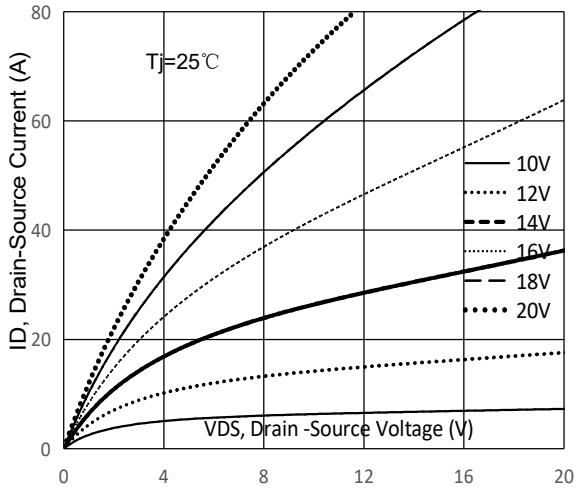


Fig1. Typical Output Characteristics

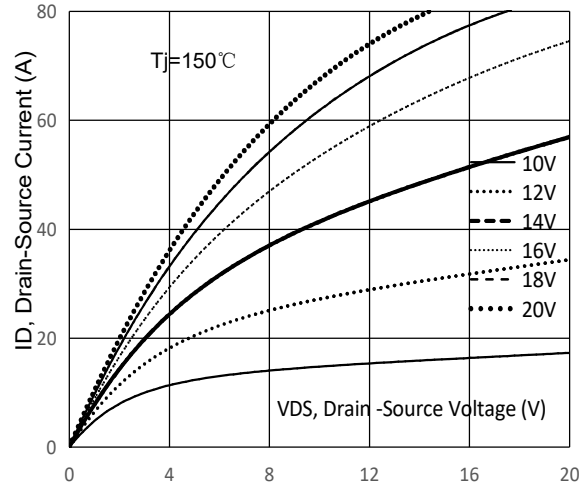


Fig2. Typical Output Characteristics

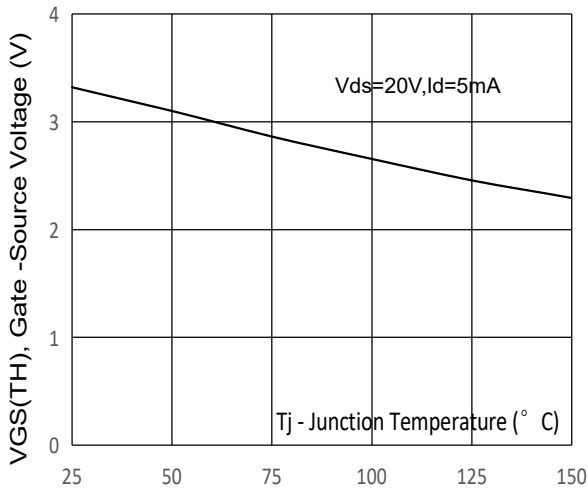


Fig3. Typical VGS(TH) Gate-Source Voltage Vs. Tj

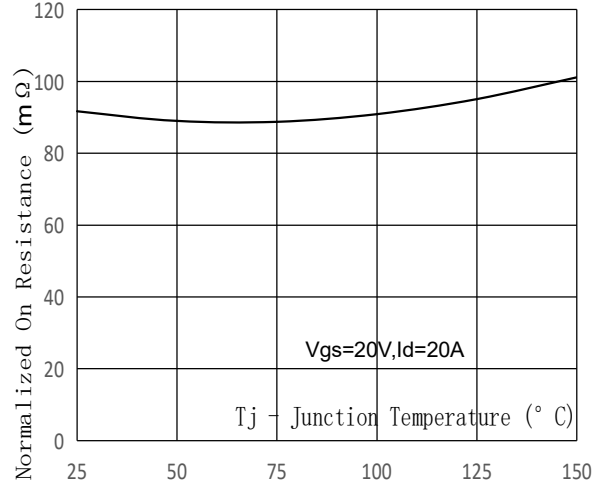


Fig4. Typical On-Resistance Vs. Tj

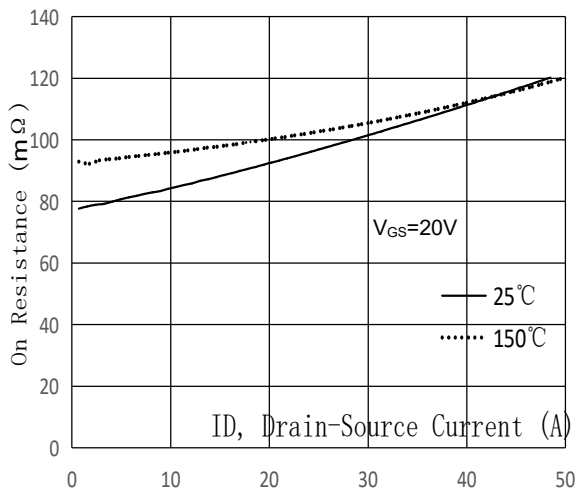


Fig5. Typical On Resistance Vs Drain Current

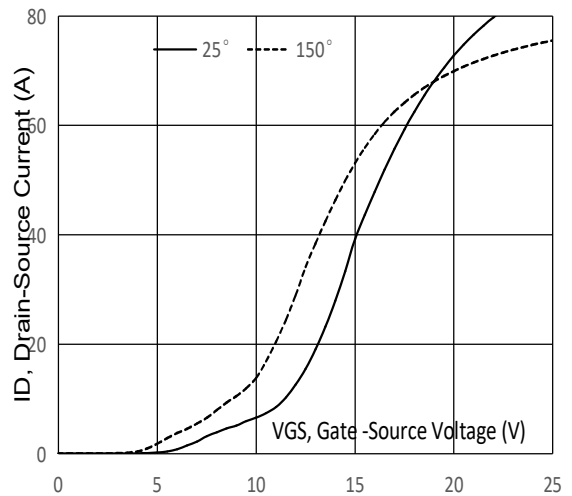


Fig6. Typical Transfer Characteristics

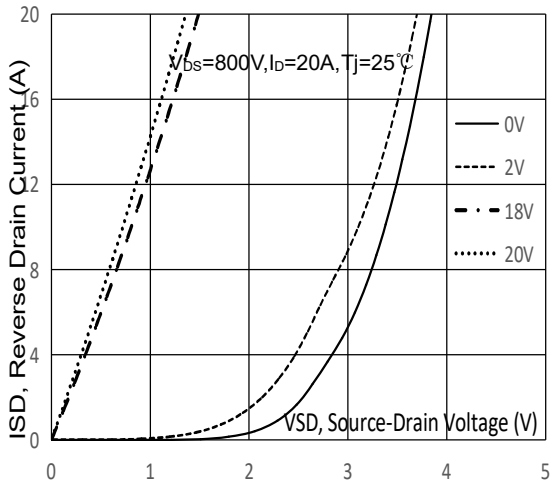


Fig7. Typical Source-Drain Diode Forward Voltage

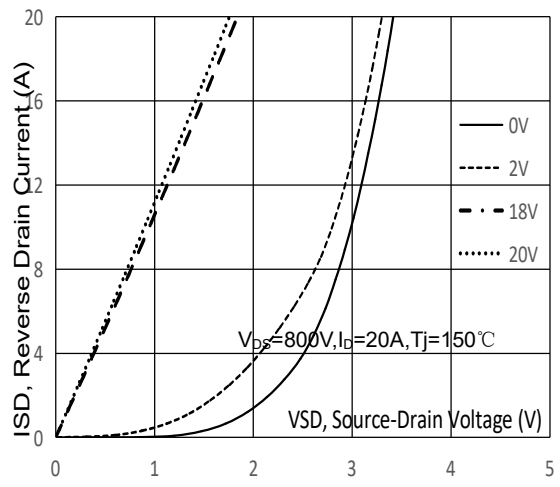


Fig8. Typical Source-Drain Diode Forward Voltage

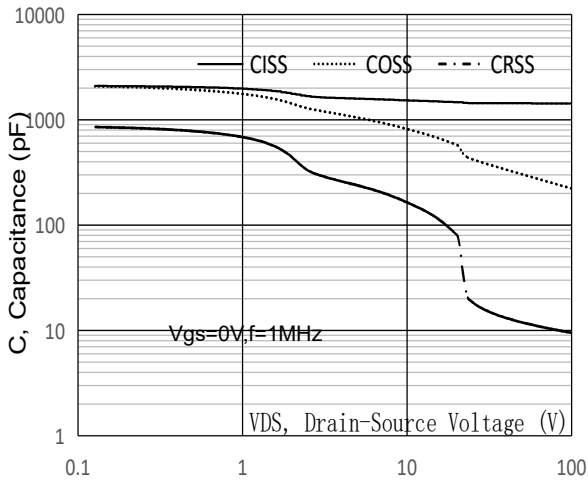


Fig9. Typical Capacitance Vs. Drain-Source Voltage

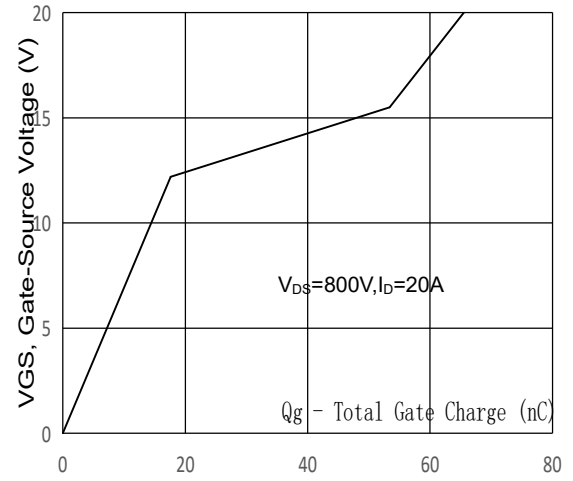


Fig10. Typical Gate Charge Vs. Gate-Source Voltage

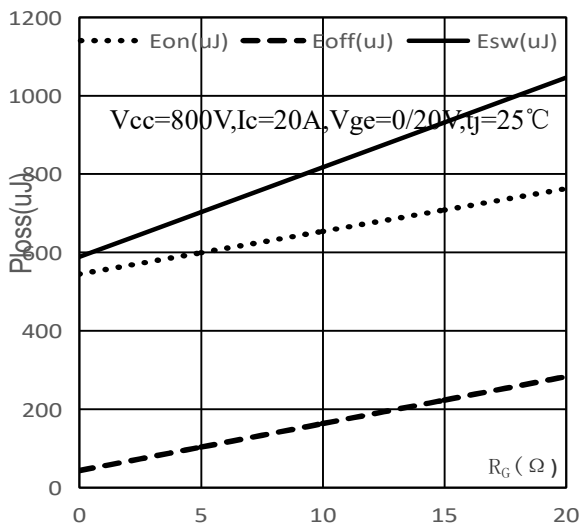


Fig11. Typical switching losses of R_G

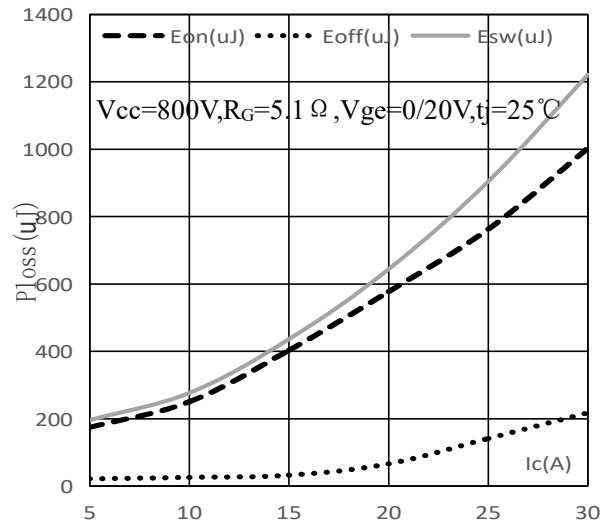


Fig12. Typical switching losses of I_C

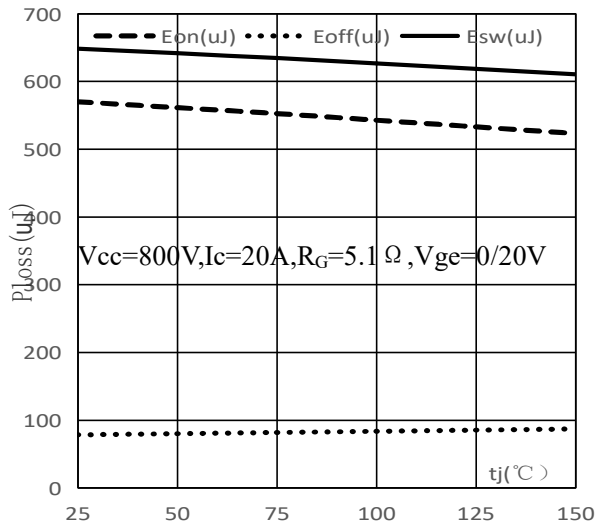


Fig13. Typical switching losses of t_j

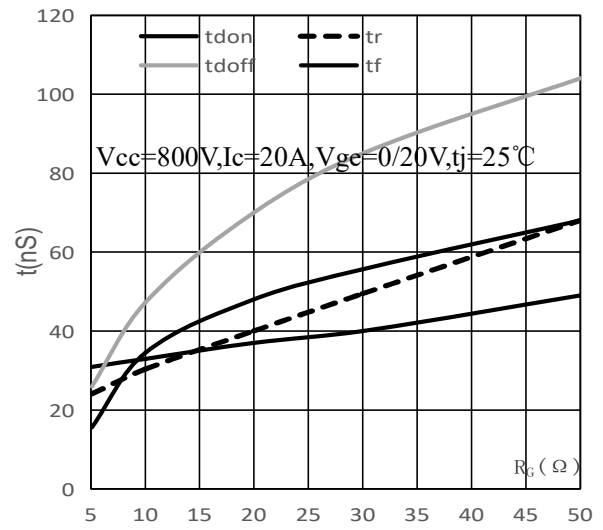


Fig14. Typical switching times as a function of R_G

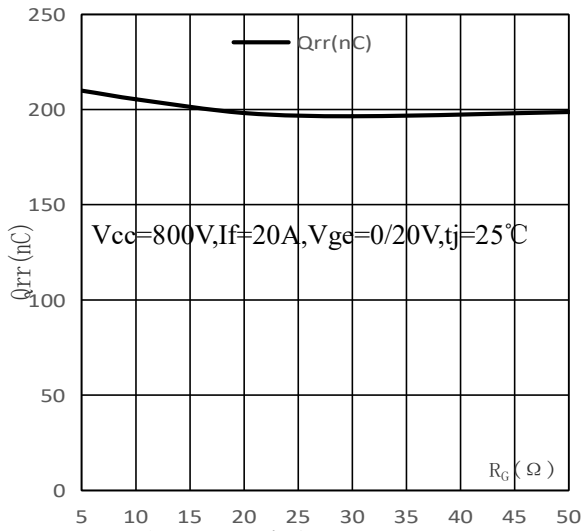


Fig15. Typical Q_{rr} as a function of R_G

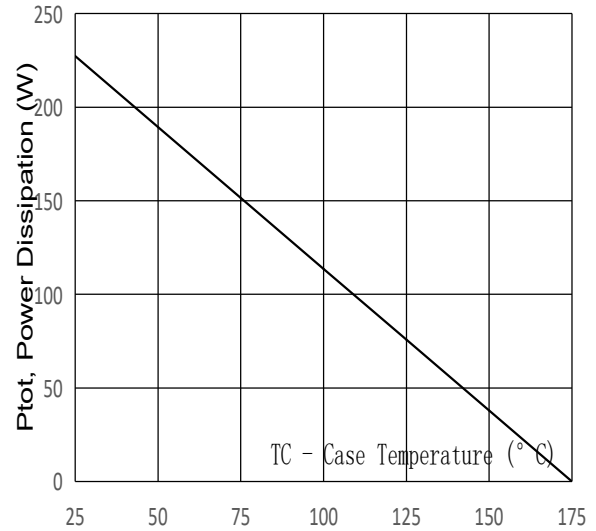
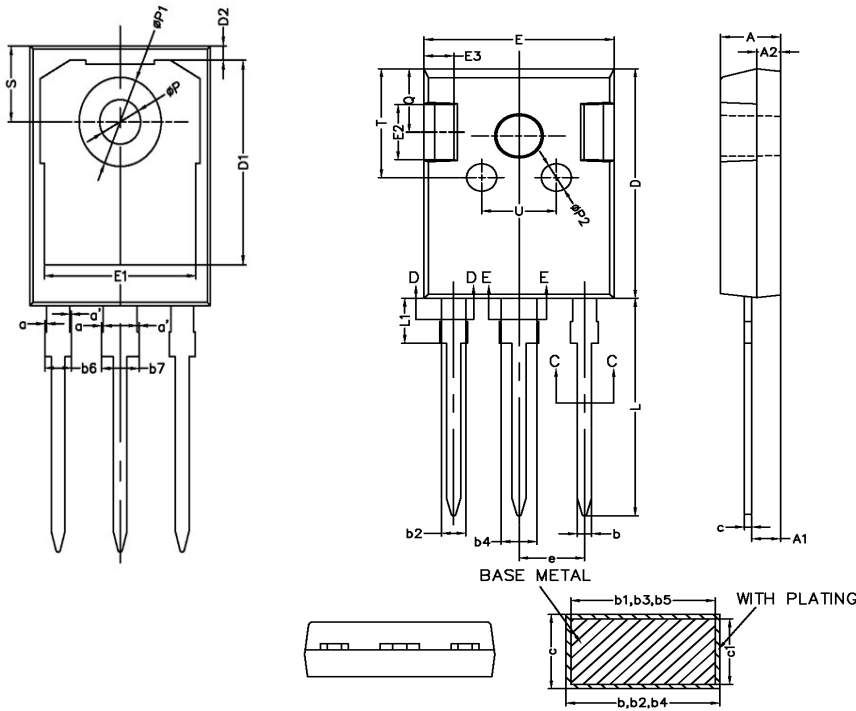


Fig16. Power Dissipation Vs. Case Temperature

TO-247 Package Outline Data



Unit:mm

SYMBOL	MIN	NOM	MAX
A	4.90	5.00	5.10
A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
a	0	-	0.15
a'	0	-	0.15
b	1.16	-	1.26
b1	1.15	1.2	1.22
b2	1.96	-	2.06
b3	1.95	2.00	2.02
b4	2.96	-	3.06
b5	2.95	3.00	3.02
b6	-	-	2.25
b7	-	-	3.25
c	0.59	-	0.66
c1	0.58	0.60	0.62
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.20	1.35
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
e	5.34	5.44	5.54
L	19.80	19.92	20.10
L1	-	-	4.30
P	3.50	3.60	3.70
P1	-	-	7.40
P2	2.40	2.50	2.60
Q	5.60	-	6.00
S	6.05	6.15	6.25
T	9.80	-	10.20
U	6.00	-	6.40