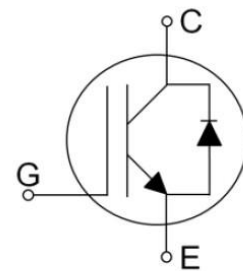


FEATURES

- High breakdown voltage up to 650V for improved reliability
- Trench-Stop Technology offering :
 - High speed switching
 - High ruggedness, temperature stable
 - Short circuit withstand time – 5μs
 - Low V_{CEsat}
 - Easy parallel switching capability due to positive temperature coefficient in V_{CEsat}

V_{CE}	650	V
I_C	100	A
$V_{CE(sat)}$ $I_C=100A$	1.75	V



APPLICATION

- Uninterruptible Power Supplies
- Inverter
- Welding Converters
- PFC applications
- Converter with high switching frequency

Product	Package	Packaging
GW100N65FP	TO-247-PLUS	Tube

Maximum Ratings (T_j= 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V _{CE}	650	V
DC collector current, limited by T _{jmax} T _C = 25°C T _C = 100°C	I _C	200 100	A
Diode Forward current, limited by T _{jmax} T _C = 25°C T _C = 100°C	I _F	150 75	A
Continuous Gate-emitter voltage	V _{GE}	± 20	V
Transient Gate-emitter voltage	V _{GE}	± 30	V
Turn off safe operating area V _{CE} ≤ 650V, T _j ≤ 175°C, t _p = 1μs	-	300	A
Pulse collector current, V _{GE} = 15V, t _p limited by T _{jmax}	I _{CM}	300	A
Short Circuit Withstand Time, V _{GE} = 15V, V _{CE} ≤ 400V	T _{SC}	5	μs
Power dissipation, T _j = 25°C	P _{tot}	500	W
Operating junction temperature	T _j	-40...+150	°C
Storage temperature	T _S	-55...+150	°C
Soldering temperature, wave soldering 1.6mm (0.063in.) from case for 10s	-	260	°C

Thermal Resistance

Parameter	Symbol	Typ. Value	Unit
IGBT thermal resistance, junction - case	R _{θ(j-c)}	0.25	K/W
Diode thermal resistance, junction - case	R _{θ(j-c)}	0.4	K/W
Thermal resistance, junction - ambient	R _{θ(j-a)}	40	K/W

Electrical Characteristics (T_j= 25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Collector-Emitter Breakdown Voltage	BV _{CES}	V _{GE} =0V, I _C =250uA	650	770	-	V
Gate Threshold Voltage	V _{GE(th)}	V _{GE} =V _{CE} , I _C =250uA	4.6	4.8	5.0	V
Collector-Emitter Saturation Voltage	V _{CE(sat)}	V _{GE} =15V, I _C =100A T _j = 25°C T _j = 175°C	- -	1.75 2.1	2.0 -	V
Zero gate voltage collector current	I _{CES}	V _{CE} = 650V, V _{GE} = 0V T _j = 25°C T _j = 175°C	- -	0.07 -	0.5 10	uA
Gate-emitter leakage current	I _{GES}	V _{CE} = 0V, V _{GE} = ±20V	-	-	100	nA
Transconductance	g _{fs}	V _{CE} = 20V, I _C = 100A	-	35	-	S

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Dynamic T_j=25°C						
Input capacitance	C _{ies}	V _{CE} = 25V, V _{GE} = 0V, f = 1MHz	-	5670	-	pF
Output capacitance	C _{oes}		-	370	-	
Reverse transfer capacitance	C _{res}		-	8	-	
Gate charge	Q _G	V _{CC} = 520V, I _C = 100A, V _{GE} = 15V	-	135	-	nC
Short circuit collector current	I _{C (SC)}	V _{GE} =15V, t _{SC} ≤ 5us V _{CC} =400V, T _{j, start} =25°C	-	640	-	A

Switching Characteristic, Inductive Load

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Dynamic $T_j=25^{\circ}\text{C}$						
Turn-on Delay Time	$t_{d(on)}$	$V_{CC} = 400\text{V}, I_C = 100.0\text{A},$ $V_{GE} = 0.0/15.0\text{V},$ $R_g = 10\Omega$	-	75	-	ns
Rise Time	t_r		-	130	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	250	-	ns
Fall Time	t_f		-	125	-	ns
Turn-on Energy	E_{on}		-	4.0	-	mJ
Turn-off Energy	E_{off}		-	3.5	-	mJ

Electrical Characteristics of the DIODE ($T_j = 25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Dynamic $T_j=25^{\circ}\text{C}$						
Diode Forward Voltage	V_{FM}	$I_F = 100\text{A}$	-	2.1	-	V
Reverse Recovery Time	T_{rr}	$I_F = 100\text{A}, V_R = 400\text{V}$ $di/dt = 850\text{A}/\mu\text{s}$	-	50	-	ns
Reverse Recovery Current	I_{rr}		-	22	-	A
Reverse Recovery Charge	Q_{rr}		-	700	-	nC

Fig.1 Output characteristics

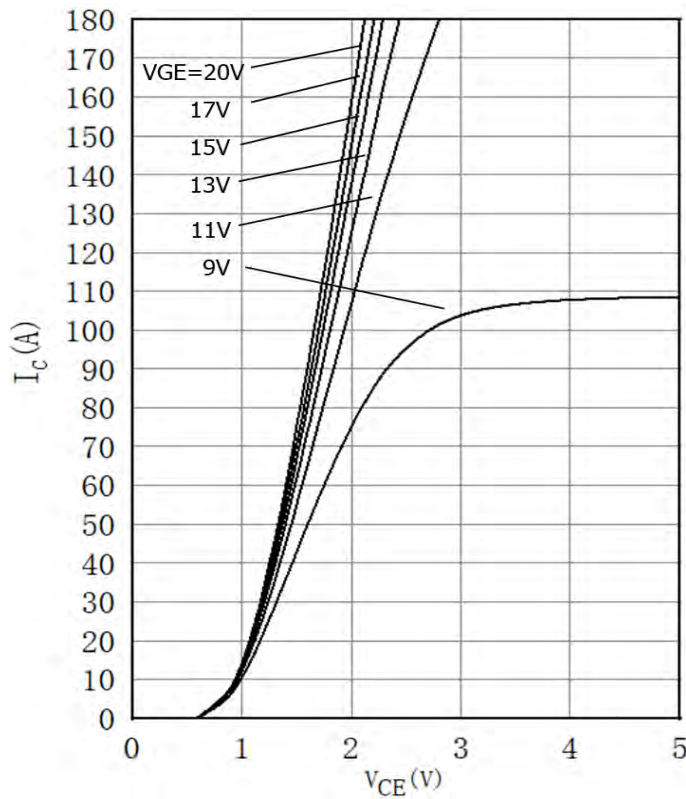


Fig.2 Transfer characteristic

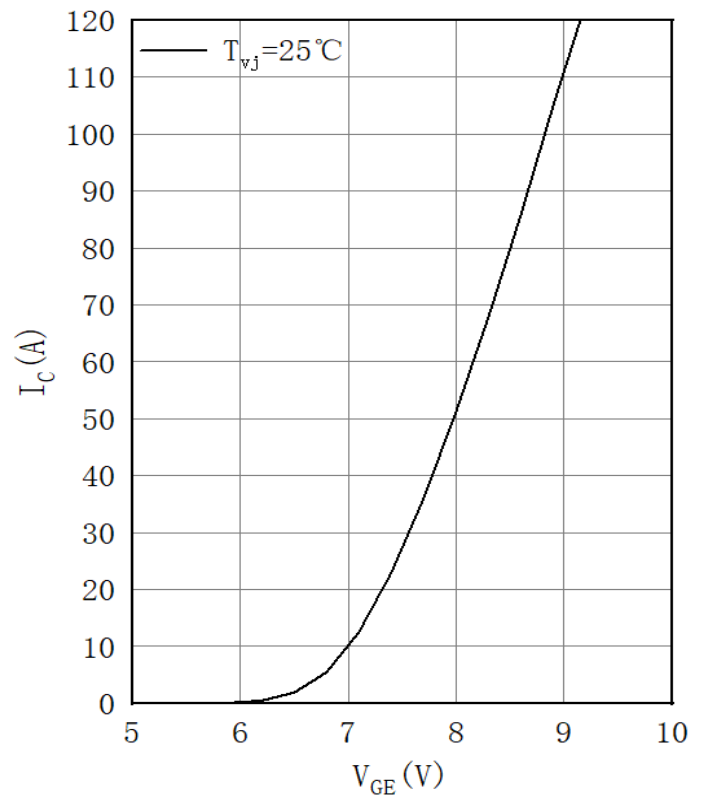


Fig.3 Switching times vs. gate resistor

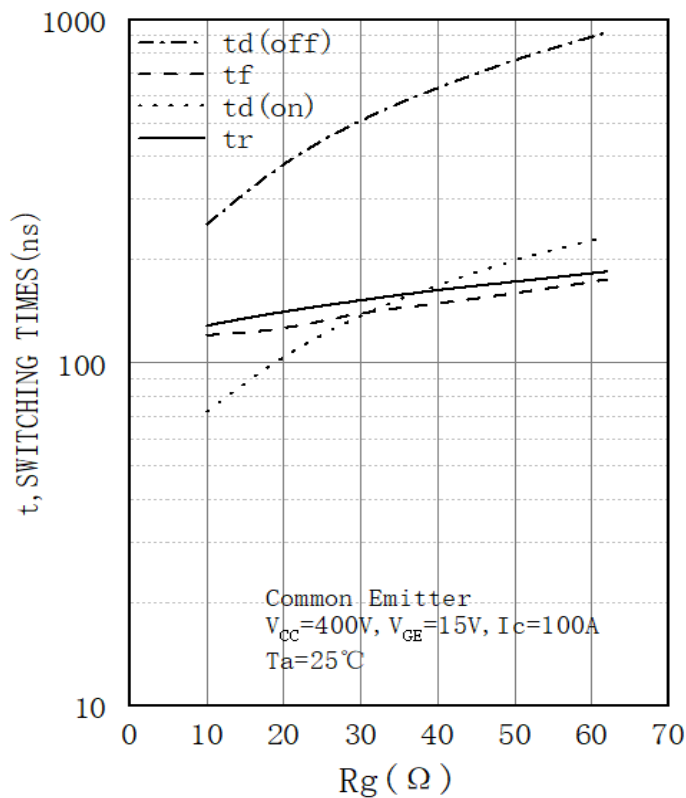


Fig.4 Switching times vs. collector current

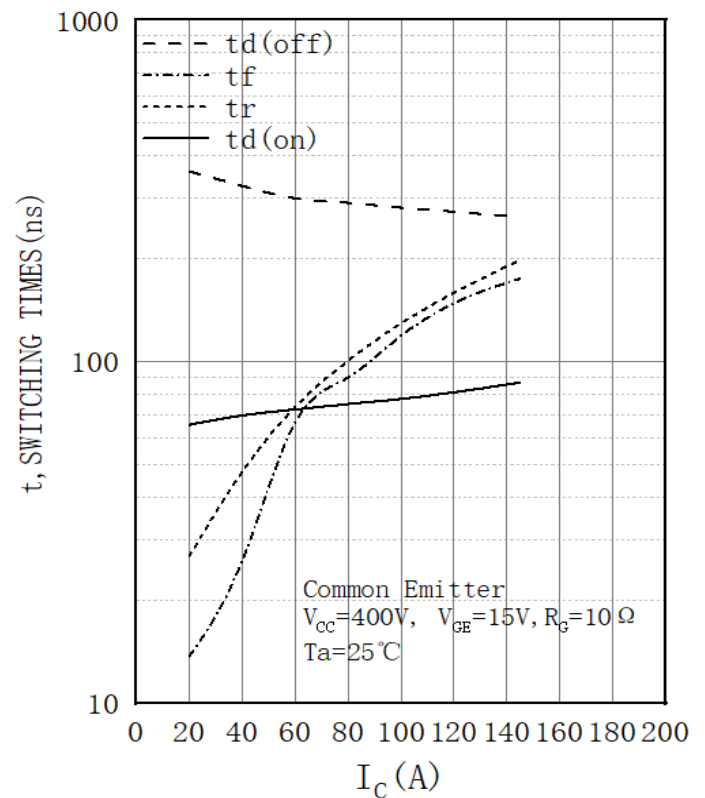


Fig.5 Switching loss vs. gate resistor

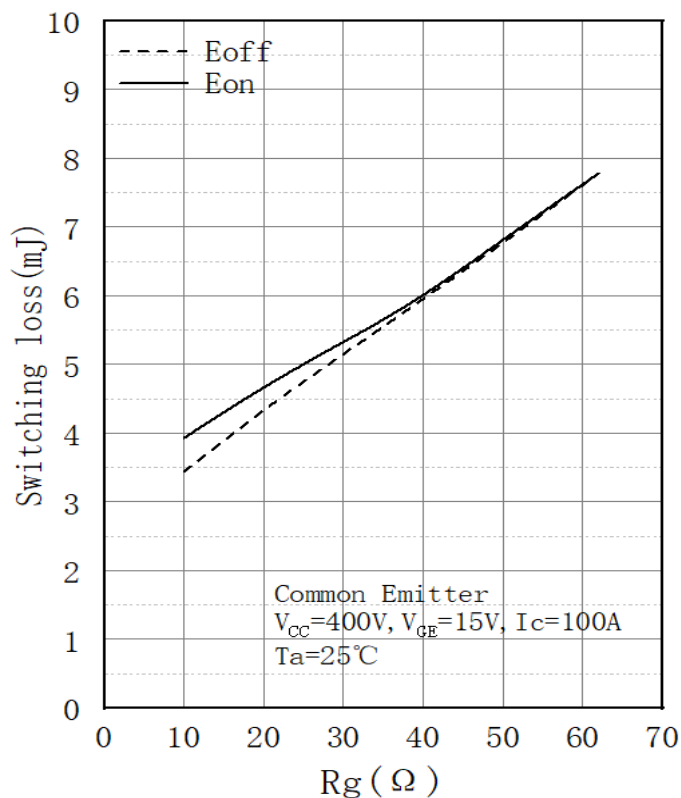


Fig.6 Switching loss vs. collector current

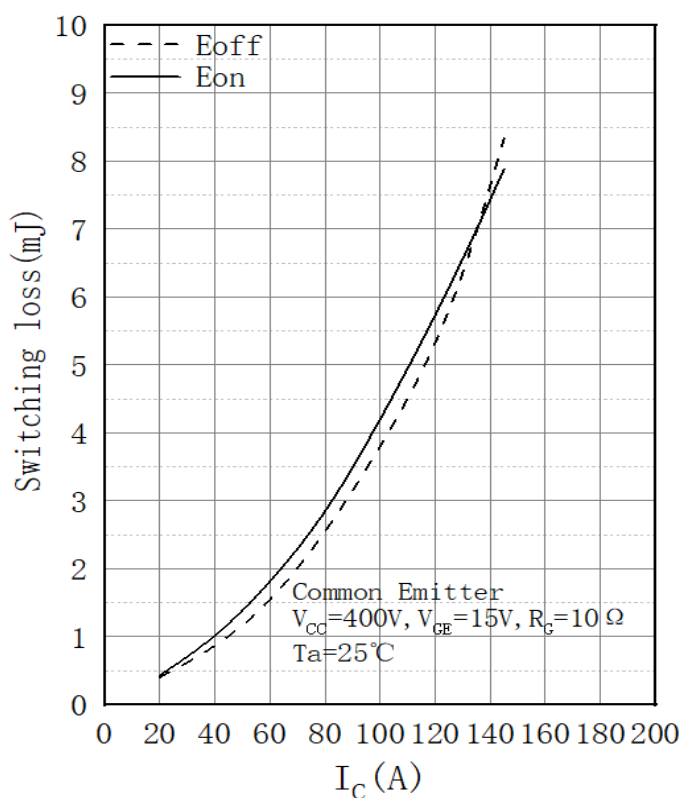


Fig.7 Gate charge characteristics

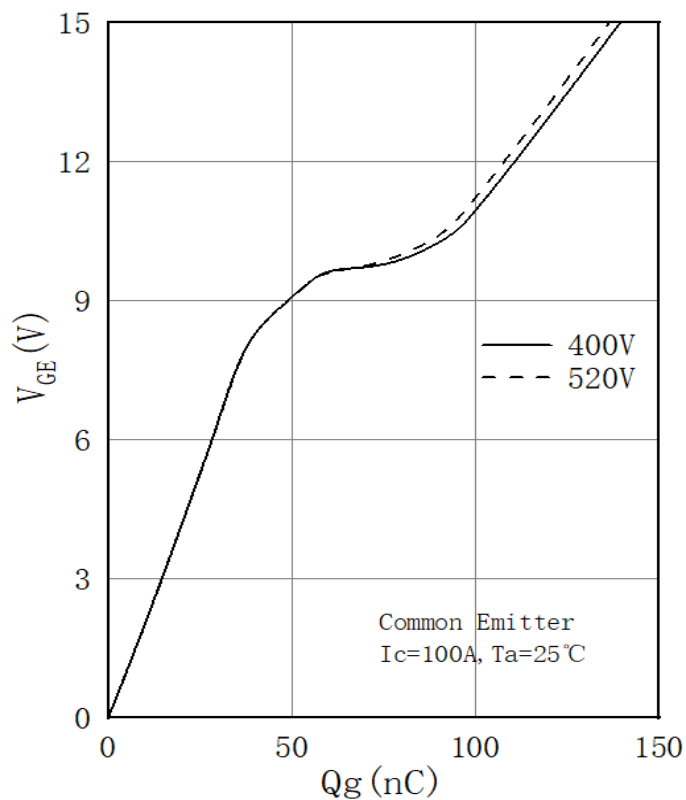
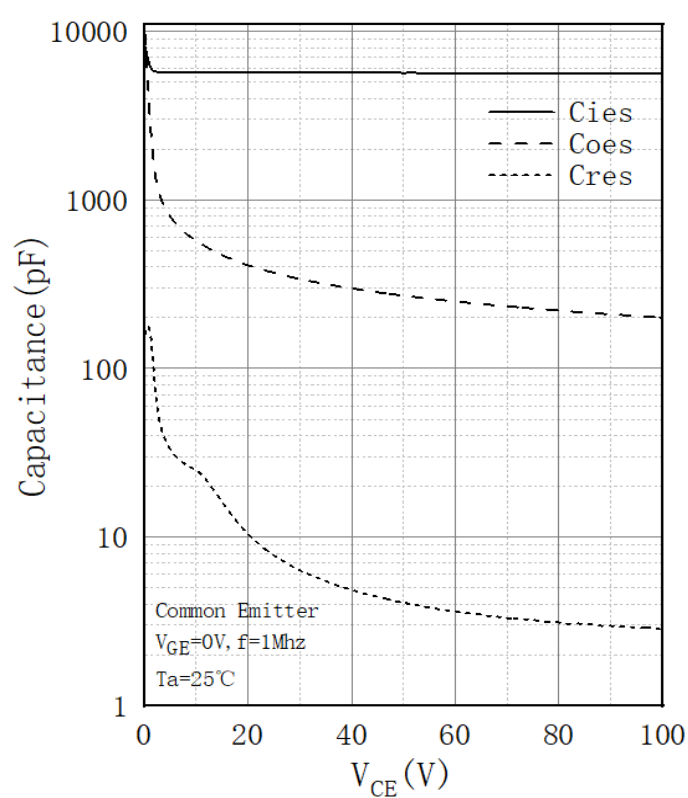
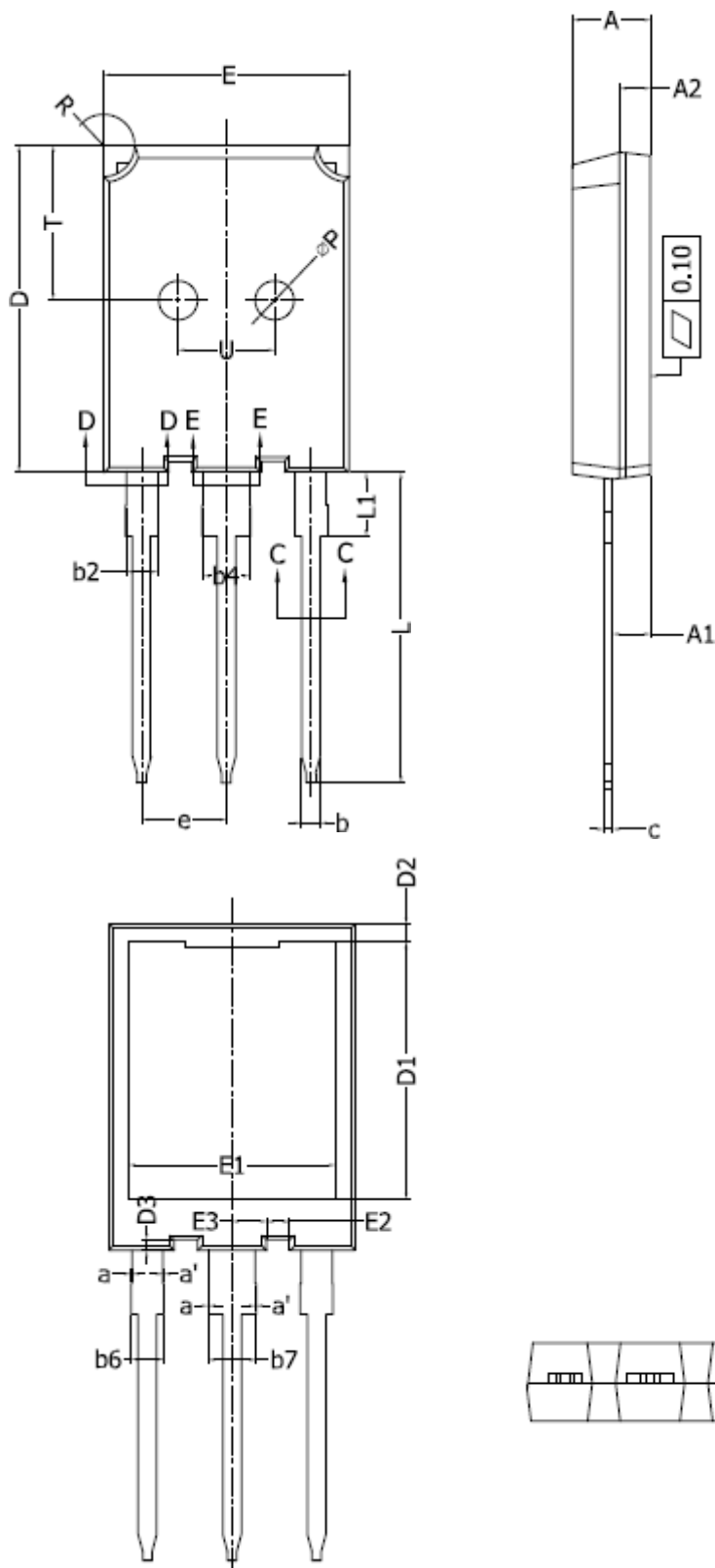


Fig.8 Capacitance characteristics

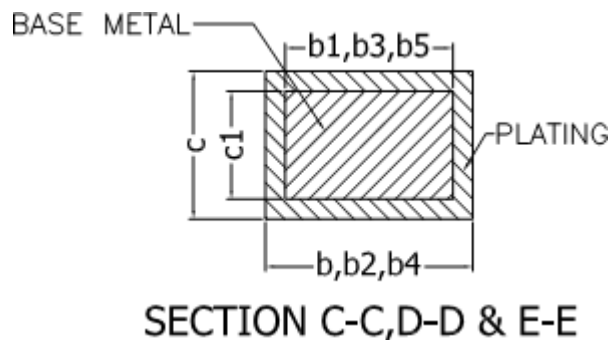


TO247-PLUS package information



COMMON DIMENSIONS
(UNITS OF MEASURE =MILLIMETER)

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	2.96	3.00	3.02
b6	—	—	2.25
b7	—	—	3.25
c	0.59	—	0.66
c1	0.59	0.60	0.66
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.17	1.35
D3	0.58	—	0.78
E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	1.40	1.50	1.60
E3	2.12	2.22	2.32
e	5.436 BSC		
L	19.80	19.95	20.10
L1	—	—	4.30
P	2.40	2.50	2.60
R	1.90	—	2.10
T	9.80	—	10.20
U	6.00	—	6.40



SECTION C-C,D-D & E-E