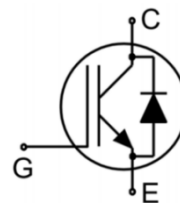


Main Product Characteristics:

V_{CES}	700V
I_C	80A
$V_{CE(sat)}$	1.6V


TO - 247

Schematic Diagram
Features and Benefits:

- Trench FS technology offering
- High speed switching
- Low gate charge and $V_{CE(sat)}$
- High ruggedness, temperature stable behavior
- Maximum junction temperature 175°C


Applications:

- Solar inverters
- Uninterruptible power supplies
- Motor drives
- Air condition

Absolute Max Rating:

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	700	V
V_{GES}	Gate- Emitter Voltage	± 30	V
I_C	Collector Current	160	A
	Collector Current @ $T_C = 100\text{ }^\circ\text{C}$	80	
	Pulsed Collector Current, t_p limited by T_{jmax}	320	
-	Turn off safe operating area, $V_{CE}=650\text{V}$, $T_J=175\text{ }^\circ\text{C}$	320	
I_F	Diode Continuous Forward Current @ $T_C = 25\text{ }^\circ\text{C}$	160	A
	Diode Continuous Forward Current @ $T_C = 100\text{ }^\circ\text{C}$	80	
	Diode Maximum Forward Current	320	
P_D	Power Dissipation @ $T_C = 25\text{ }^\circ\text{C}$	469	W
	Power Dissipation @ $T_C = 100\text{ }^\circ\text{C}$	234	W
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	$^\circ\text{C}$
T_L	Maximum Temperature for Soldering	260	$^\circ\text{C}$

Thermal Resistance

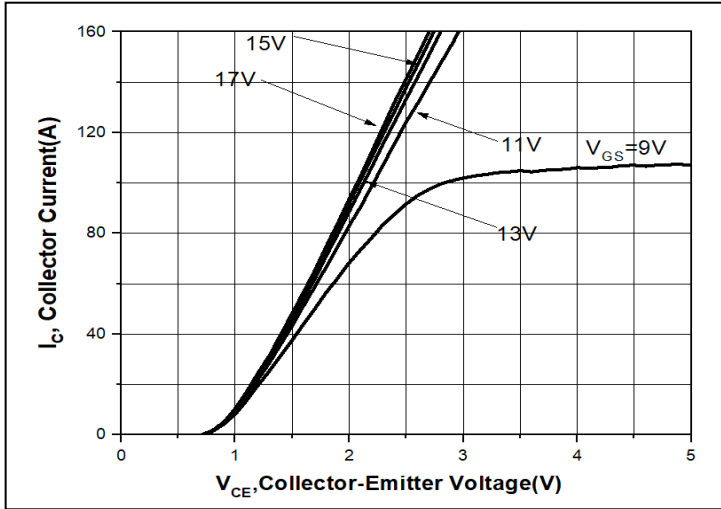
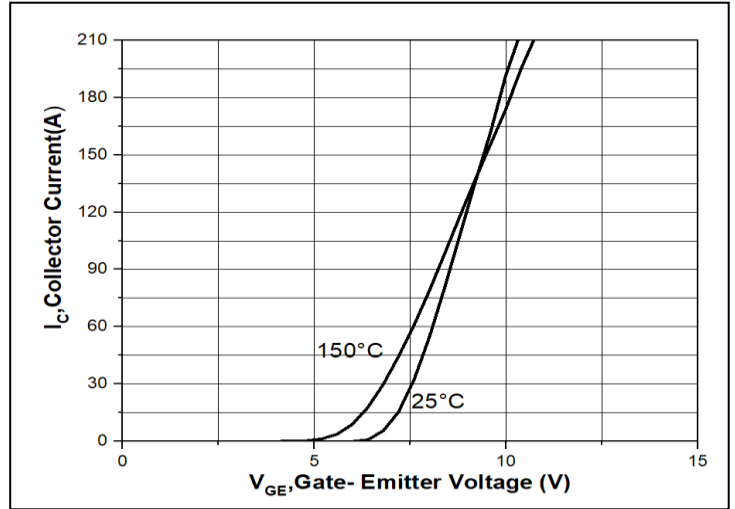
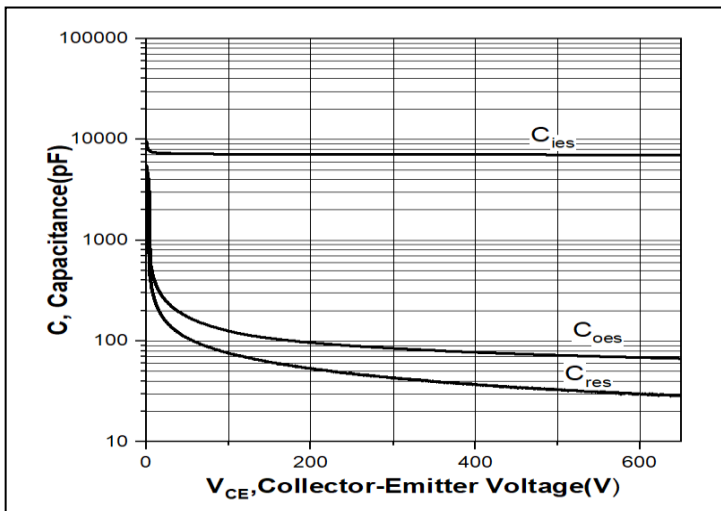
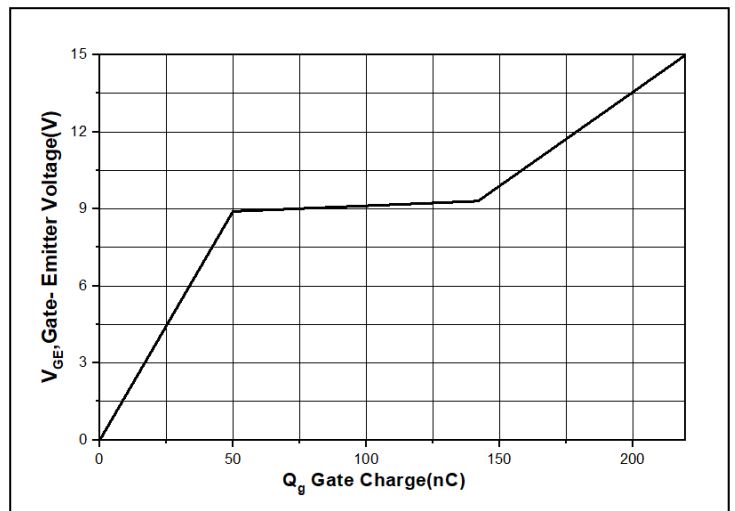
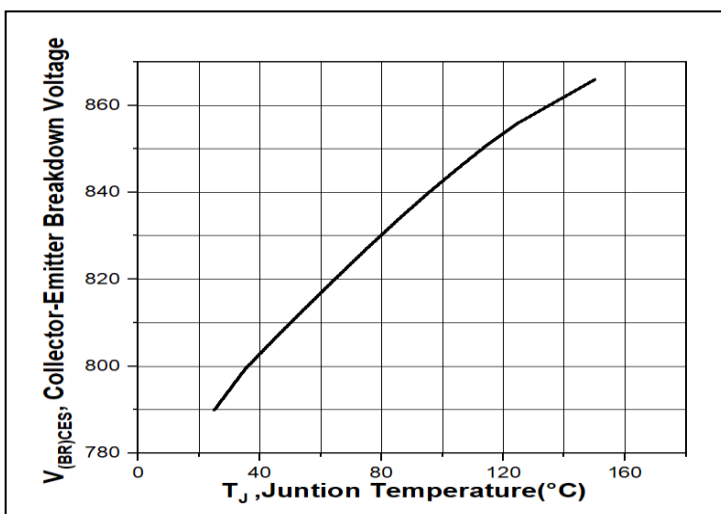
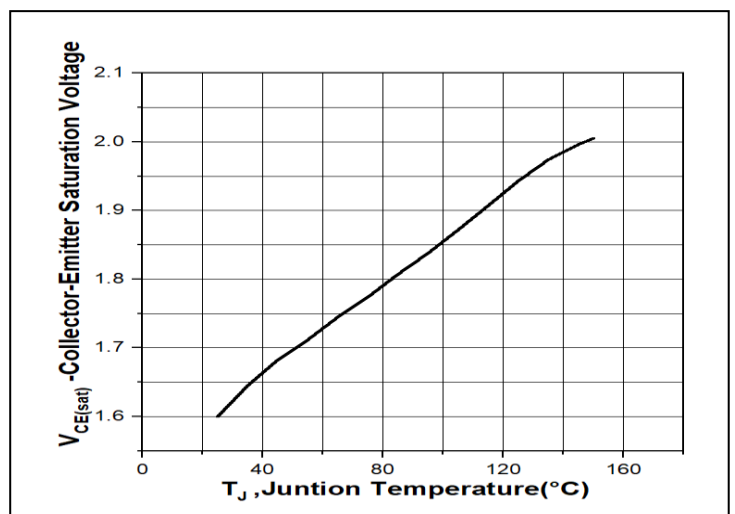
Symbol	Characterizes	Typ.	Max.	Units
R _{θJC}	Thermal Resistance, Junction-to-case for IGBT	—	0.32	°C/W
	Thermal Resistance, Junction-to-case for Diode	—	0.44	°C/W
R _{θJA}	Thermal Resistance, Junction-to-ambient	—	40	°C/W

Electrical Characteristics @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{(BR)CES}	Collector-Emitter Breakdown Voltage	700	760	—	V	V _{GE} =0V, I _{CE} =1mA
V _{CE(sat)}	Collector-Emitter Saturation Voltage	—	1.6	1.85	V	I _C =80A, V _{GE} =15V @ T _J =25°C
V _{GE(th)}	Gate Threshold Voltage	4.5	—	6.5	V	I _C =250μA, V _{CE} =V _{GE}
I _{CES}	Collector-Emitter Leakage Current	—	—	1	μA	V _{GE} =0V, V _{CE} =650V
I _{GES}	Gate to Emitter Reverse Leakage	—	—	100	nA	V _{GE} =20V, V _{CE} =0V
		—	—	-100		V _{GE} =-20V, V _{CE} =0V
C _{ies}	Input capacitance	—	7278	—	pF	V _{GS} = 0V
C _{oes}	Output capacitance	—	248	—		V _{DS} = 25V
C _{res}	Reverse transfer capacitance	—	151	—		f = 1MHz
t _{d(on)}	Turn-on delay time	—	56	—	ns	V _{CC} =400V, I _C =80A, V _{GE} =0/15V, R _g =10Ω,
t _r	Rise time	—	82	—		
t _{d(off)}	Turn-Off delay time	—	318	—		
t _f	Fall time	—	52	—		
E _{on}	Turn-On Switching Loss	—	3.73	—	mJ	V _{CC} =400V, I _C =80A, V _{GE} =0/15V, R _g =10Ω,
E _{off}	Turn-Off Switching Loss	—	1.72	—		
E _{ts}	Total Switching Loss	—	5.45	—		
Q _g	Total Gate Charge	—	220	—	nC	V _{CC} =480V, I _C =80A, V _{GE} =15V
Q _{ge}	Gate to Emitter Charge	—	50	—		
Q _{gc}	Gate to Collector Charge	—	92	—		
I _{C(SC)}	Short circuit collector current Max.1000 short circuits Time between short circuits: ≥1.0s	—	660	—	A	V _{GE} =15V, V _{CC} ≤400V, t _{sc} ≤7μs

Electrical Characteristics of the Diode @T_A=25°C unless otherwise specified

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{FM}	Diode Forward Voltage	—	1.72	3	V	I _F =80A
t _{rr}	Reverse Recovery Time	—	162	—	ns	T _J = 25°C, I _F =80A, V _R =400V V _{GE} =0/15V
Q _{rr}	Reverse Recovery Charge	—	1.53	—	μC	
I _{RRM}	Diode Peak Reverse Recovery Current	—	16.3	—	A	

Typical Electrical and Thermal Characteristics

Figure1. Typical Output Characteristics

Figure2. Typical Transfer Characteristics

Figure3. Typical Capacitance

Figure4. Typical Gate Charge

Figure5. Collector-Emitter Breakdown Voltage vs. Temperature

Figure6. Collector-Emitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

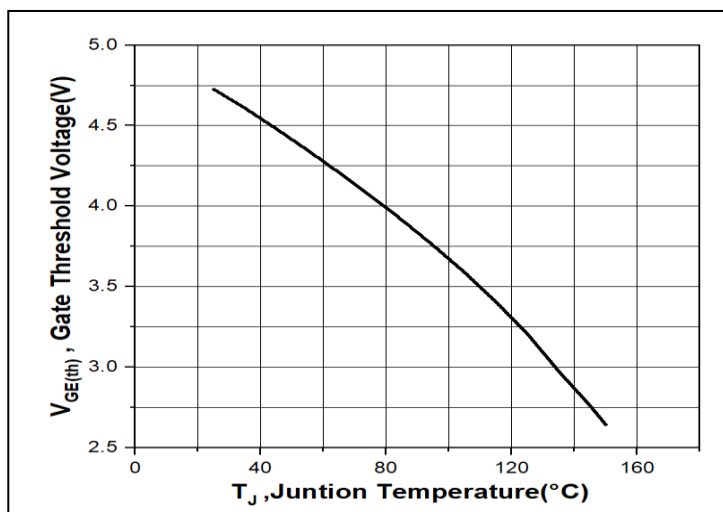


Figure7. Gate Threshold Voltage vs. Temperature

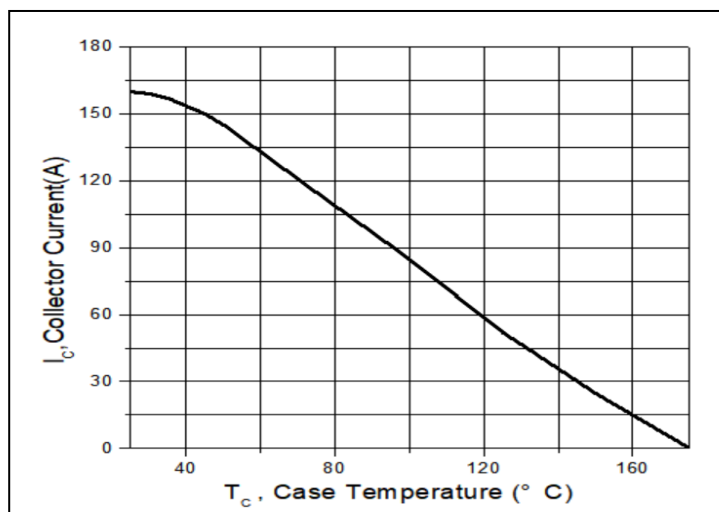


Figure8. Collector Current vs. Temperature

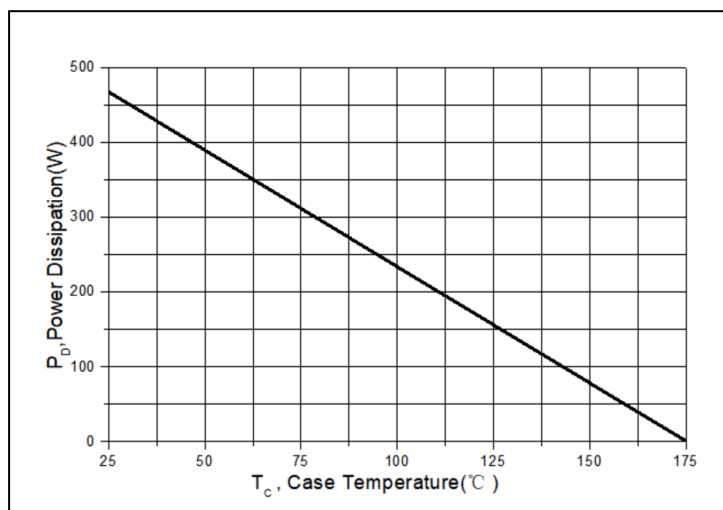


Figure9. Power Dissipation vs. Case Temperature

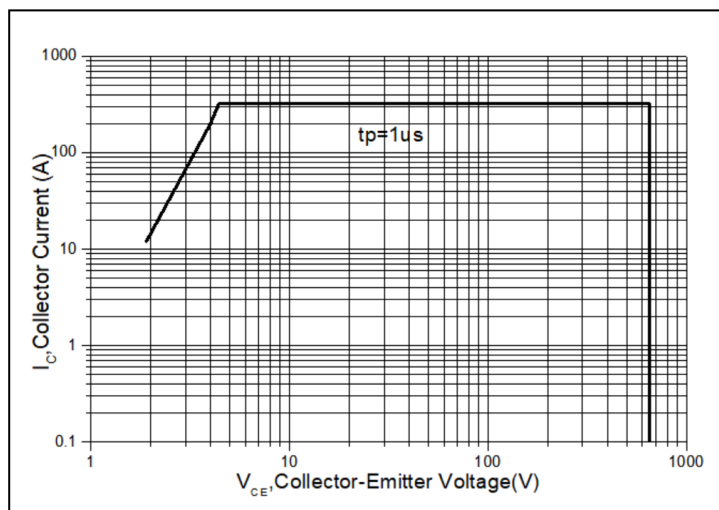
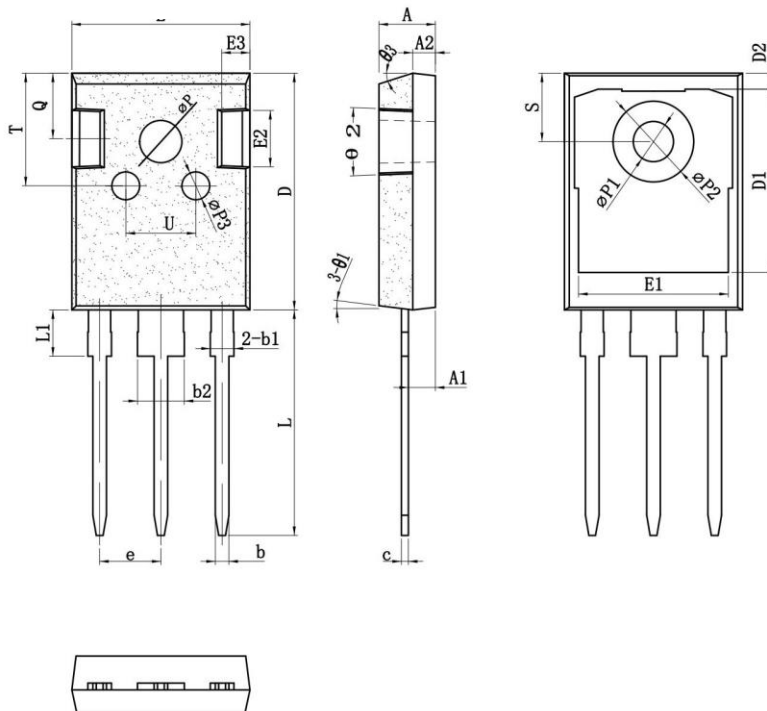
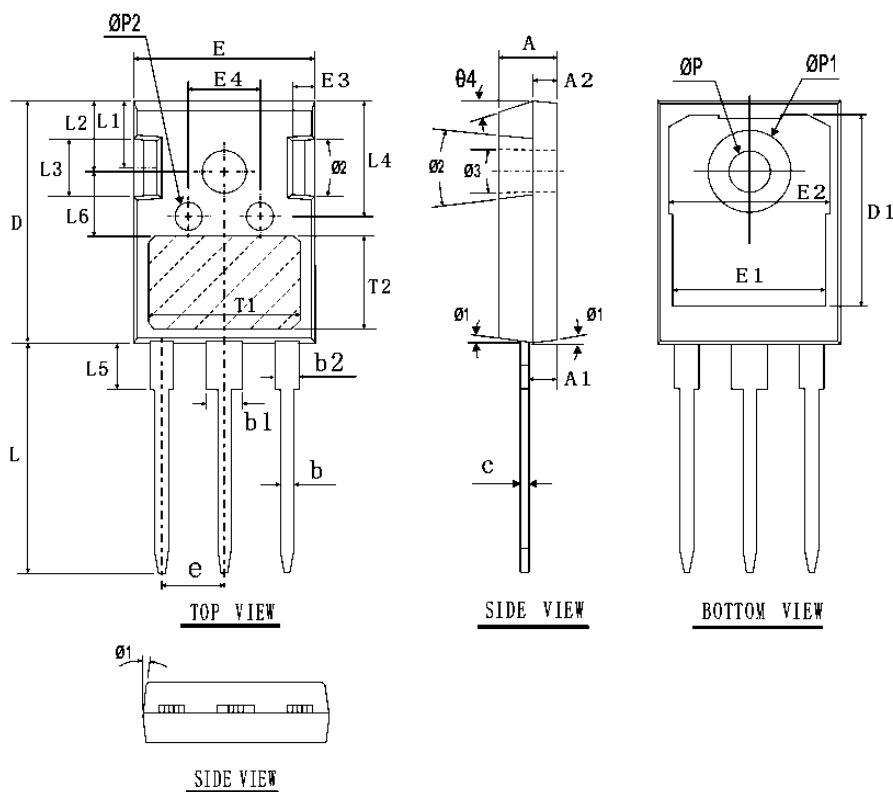


Figure10. Forward Bias Safe Operating Area

Mechanical Data:
Option1:
Unit:mm


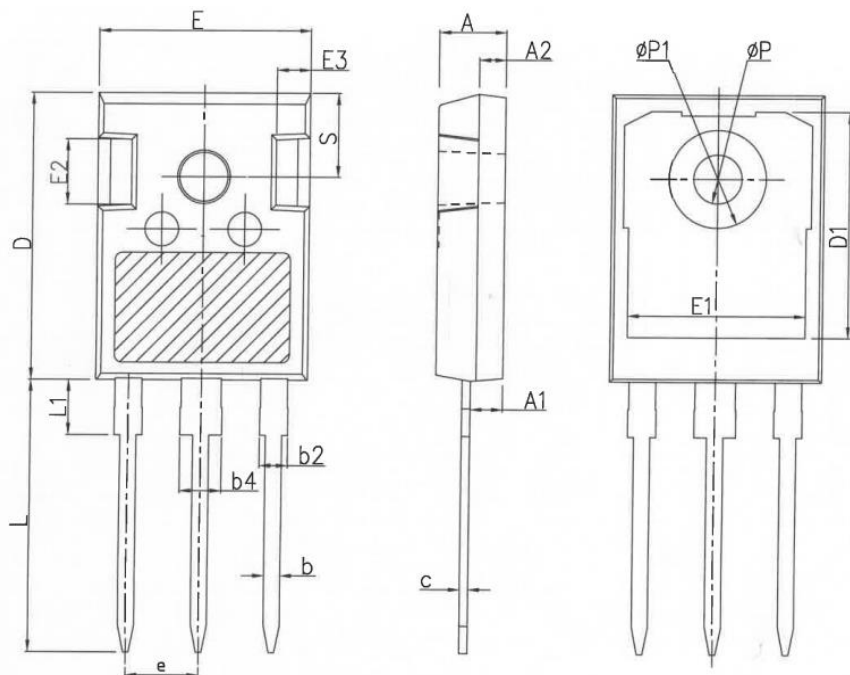
SYMBOL	mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
*c	0.55	0.60	0.65
*D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	5.48
*L	19.80	19.98	20.15
*L1	-	-	4.30
*ΦP	3.60	3.70	3.80
*ΦP1	3.45	3.55	3.65
ΦP2	7.03	7.18	7.33
ΦP3	2.40	2.50	2.60
Q	5.60	5.80	6.00
*S	6.05	6.15	6.25
T	9.80	10.00	10.20
U	6.00	6.20	6.40
θ1	5°	7°	9°
θ2	1°	3°	5°
θ3	13°	15°	17°

Option2:



COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

SYMBOL	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.20	2.40	2.60
A2	1.85	2.00	2.15
b	1.10	1.20	1.30
b1	2.80	3.00	3.20
b2	1.80	2.00	2.20
C	0.52	0.62	0.72
D	20.35	20.65	20.95
D1	16.35	16.55	16.75
E	15.50	15.80	16.10
E1	13.10	13.30	13.50
E2	13.80	14.00	14.20
E3	1.45	1.60	1.75
E4	6.00	6.20	6.40
L	19.80	20.00	20.20
L1	5.88	5.98	6.08
L2	5.88	5.98	6.08
L3	4.90	5.00	5.10
L4	9.70	9.80	9.90
L5	4.10	4.30	4.50
L6	—	—	—
Ø1	4°	7°	10°
Ø2	11°	14°	17°
Ø3	1°	—	2°
Ø4	10°	15°	20°
ØP	3.35	3.60	3.85
ØP1	—	—	7.30
ØP2	2.25	2.50	2.75
e	5.44BSC		
T1	12.80REF		
T2	7.80REF		
L6	5.50REF		

Option3:


SYMBOL	COMMON DIMENSIONS		
	mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.59
A2	1.85	2.00	2.15
b	1.11	1.21	1.36
b2	1.91	2.01	2.21
b4	2.91	3.01	3.21
c	0.51	0.61	0.75
D	20.70	21.00	21.30
D1	16.25	16.55	16.85
E	15.50	15.80	16.10
E1	13.00	13.30	13.60
E2	4.80	5.00	5.20
E3	2.30	2.50	2.70
e	5.44BSC		
L	19.62	19.92	20.22
L1	-	-	4.30
ΦP	3.40	3.60	3.80
ΦP1	-	-	7.30
S	6.15BSC		

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