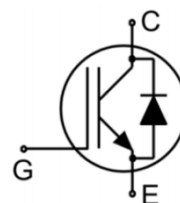


Main Product Characteristics:

V_{CES}	700V
I_C	40A
$V_{CE(sat)}$	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	80	A
	Collector Current @ $T_C = 100\text{ }^\circ\text{C}$	40	
	Pulsed Collector Current, t_p limited by T_{Jmax}	160	
-	Turn off safe operating area, $V_{CE}=650\text{V}$, $T_J=175\text{ }^\circ\text{C}$	160	
I_F	Diode Continuous Forward Current @ $T_C = 25\text{ }^\circ\text{C}$	80	A
	Diode Continuous Forward Current @ $T_C = 100\text{ }^\circ\text{C}$	40	
	Diode Maximum Forward Current	160	
P_D	Power Dissipation @ $T_C = 25\text{ }^\circ\text{C}$	394	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	—	0.38	°C/W
	Thermal Resistance, Junction-to-case for Diode	—	0.65	°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	—	—	V	V _{GE} =0V, I _{CE} =1mA
V _{CE(sat)}	Collector-Emitter Saturation Voltage	—	1.6	1.85	V	I _C =40A, V _{GE} =15V @ T _J =25°C
V _{GE(th)}	Gate Threshold Voltage	4	—	6	V	I _C =250μA, V _{CE} =V _{GE}
I _{CES}	Collector-Emitter Leakage Current	—	—	1	μA	V _{GE} =0V, V _{CE} =700V
I _{GES}	Gate to Emitter Reverse Leakage	—	—	100	nA	V _{GE} =25V, V _{CE} =0V
		—	—	-100		V _{GE} =-25V, V _{CE} =0V
C _{ies}	Input capacitance	—	2756	—	pF	V _{GS} = 0V
C _{oes}	Output capacitance	—	123	—		V _{DS} = 25V
C _{res}	Reverse transfer capacitance	—	70	—		f = 1MHz
t _{d(on)}	Turn-on delay time	—	28	—	ns	V _{CC} =400V, I _C =40A, V _{GE} =0/15V, R _g =10Ω,
t _r	Rise time	—	41	—		
t _{d(off)}	Turn-Off delay time	—	152	—		
t _f	Fall time	—	63	—		
E _{on}	Turn-On Switching Loss	—	0.9	—	mJ	V _{CC} =400V, I _C =40A, V _{GE} =0/15V, R _g =10Ω,
E _{off}	Turn-Off Switching Loss	—	0.6	—		
E _{ts}	Total Switching Loss	—	1.7	—		
Q _g	Total Gate Charge	—	155	—	nC	V _{CC} =480V, I _C =40A, V _{GE} =15V
Q _{ge}	Gate to Emitter Charge	—	34	—		
Q _{gc}	Gate to Collector Charge	—	63	—		
I _{C(SC)}	Short circuit collector current	—	340	—	A	V _{GE} =15V, V _{CC} ≤400V, t _{sc} ≤5μs
	Max.1000 short circuits Time between short circuits: ≥1.0s					

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V _{FM}	Diode Forward Voltage	—	1.7	2.4	V	I _F =40A
t _{rr}	Reverse Recovery Time	—	65	—	ns	T _J = 25°C, I _F =40A, di/dt = 200A/μs
Q _{rr}	Reverse Recovery Charge	—	0.73	—	μC	
I _{RRM}	Diode Peak Reverse Recovery Current	—	21.2	—	A	

Typical Electrical and Thermal Characteristics

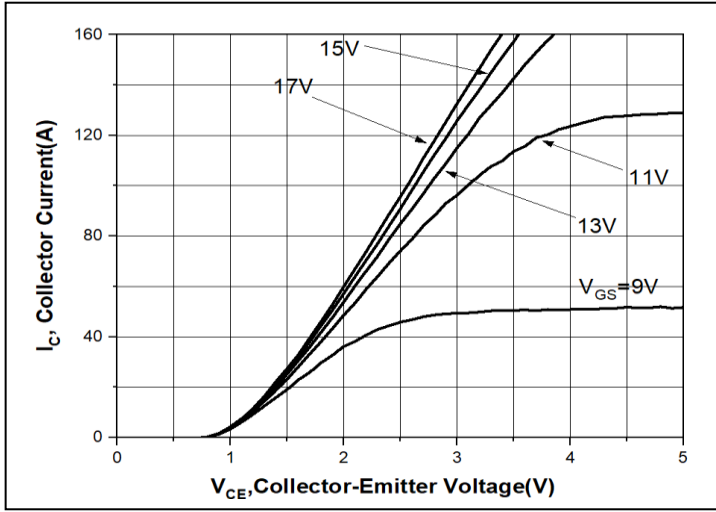


Figure1. Typical Output Characteristics

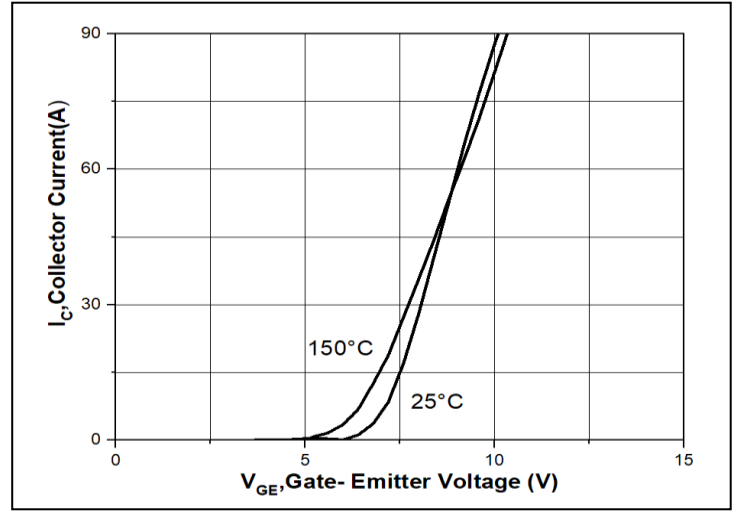


Figure2. Typical Transfer Characteristics

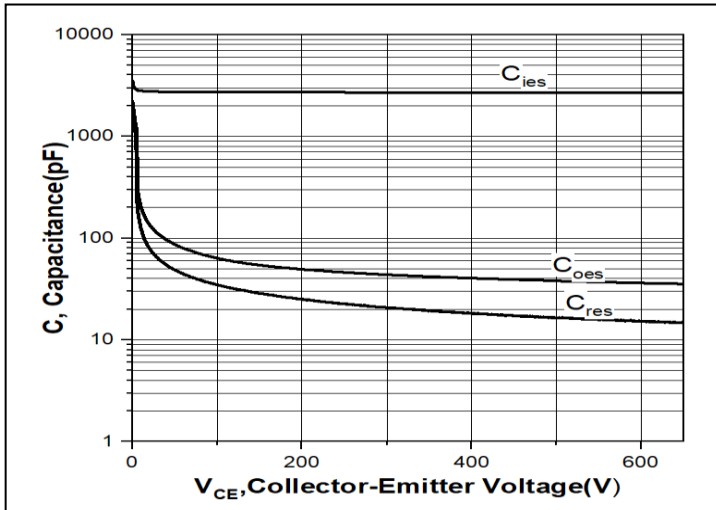


Figure3. Typical Capacitance

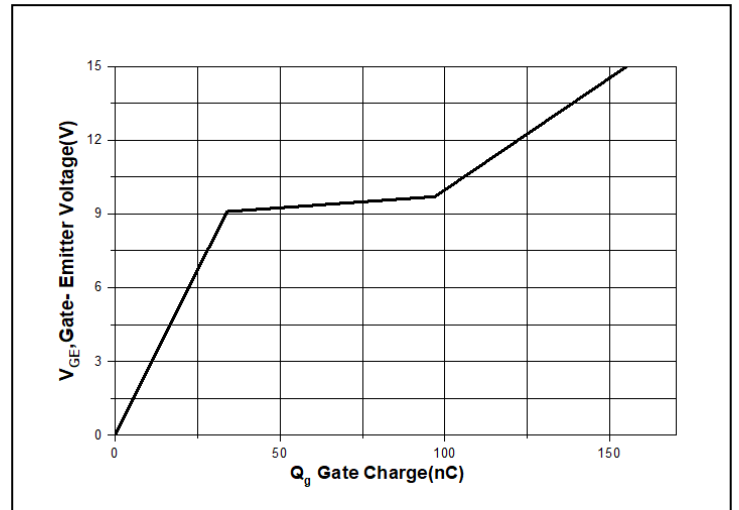


Figure4. Typical Gate Charge

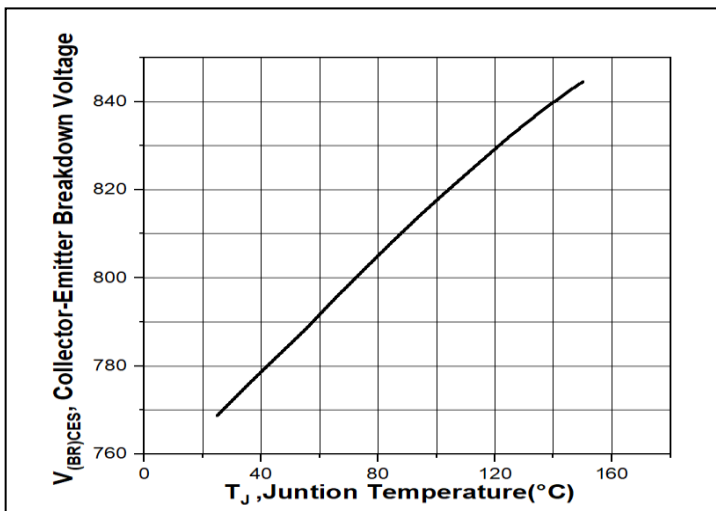


Figure5. Collector-Emmitter Breakdown Voltage vs. Temperature

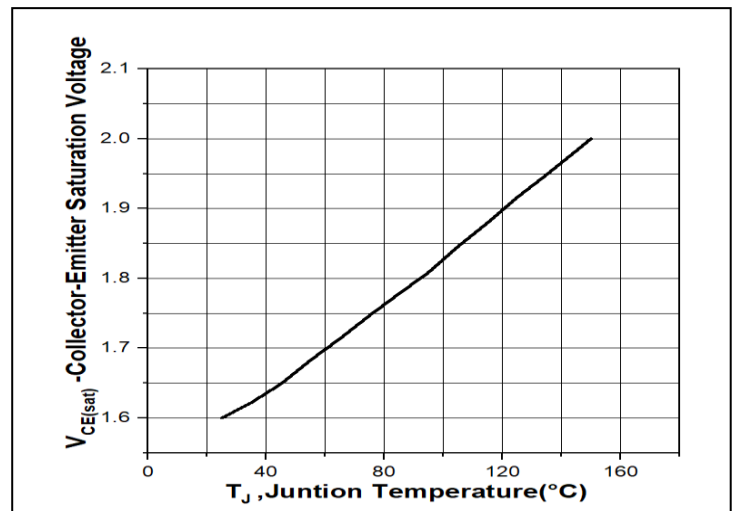


Figure6. Collector-Emmitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

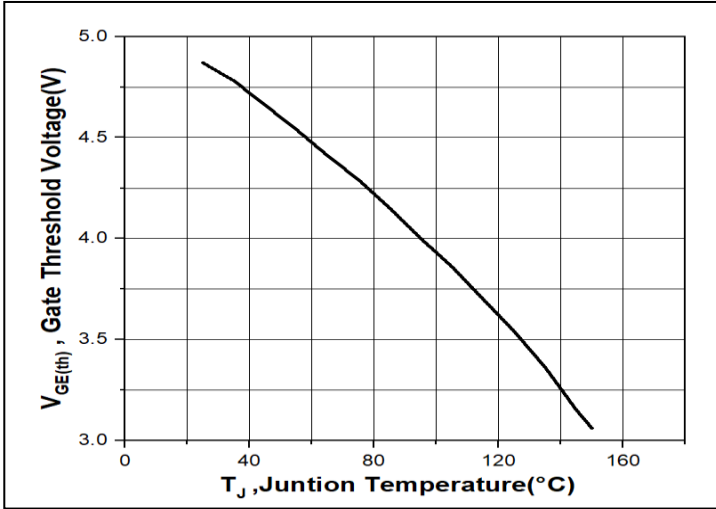


Figure7. Gate Threshold Voltage vs. Temperature

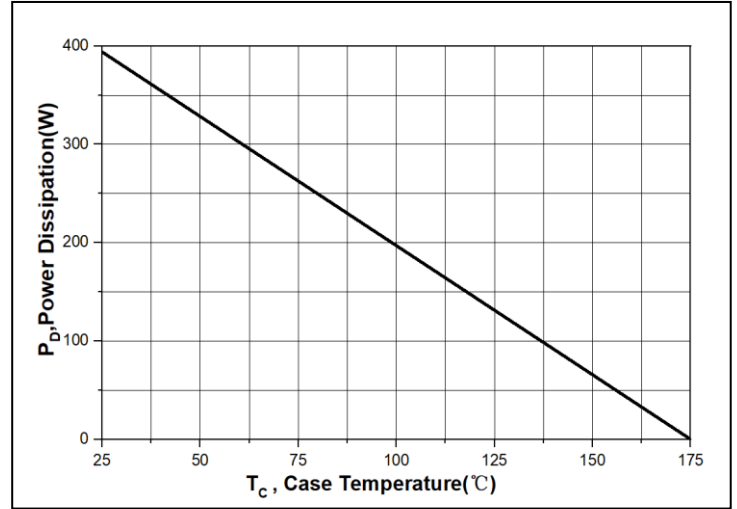


Figure8. Power Dissipation vs. Case Temperature

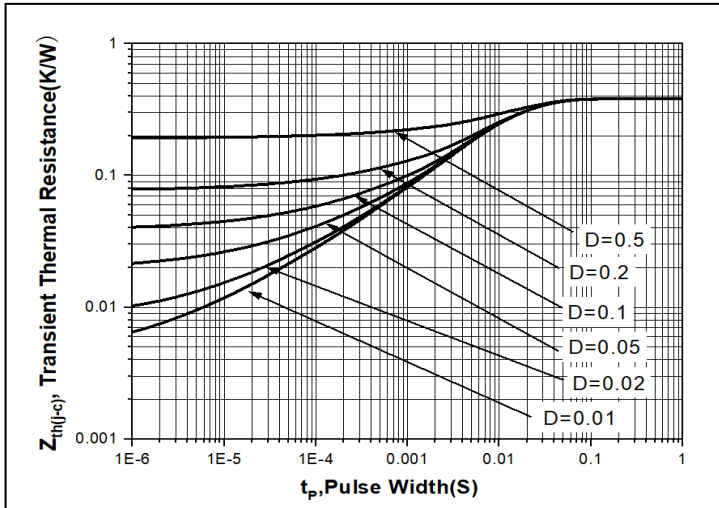


Figure9. IGBT transient thermal resistance ($D = t_p/T$)

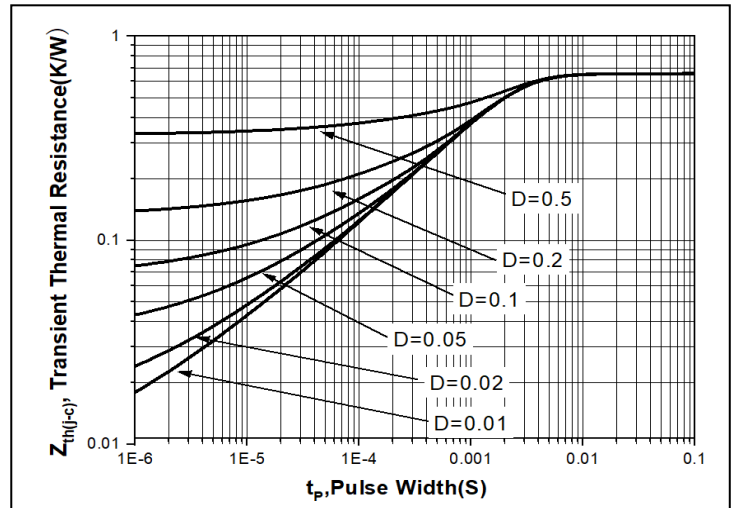
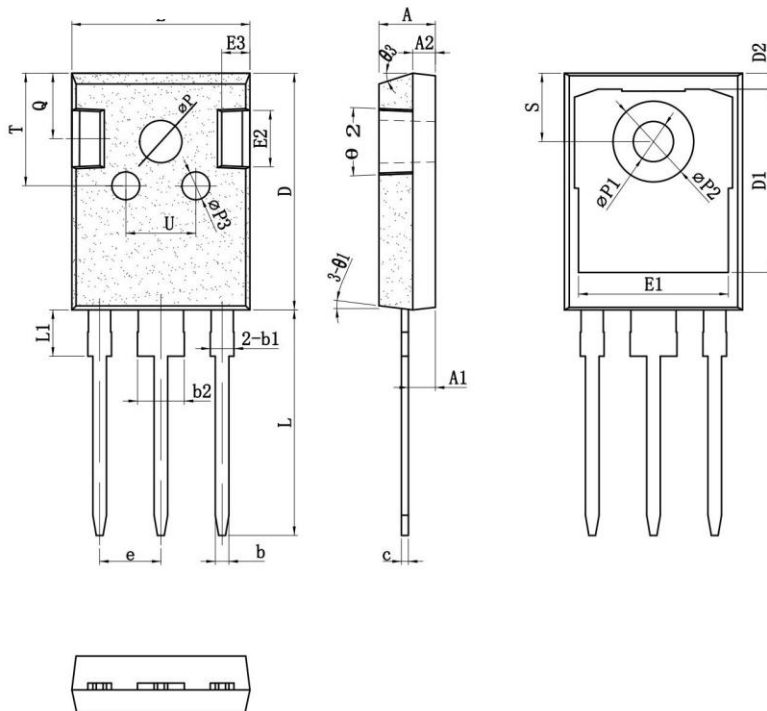
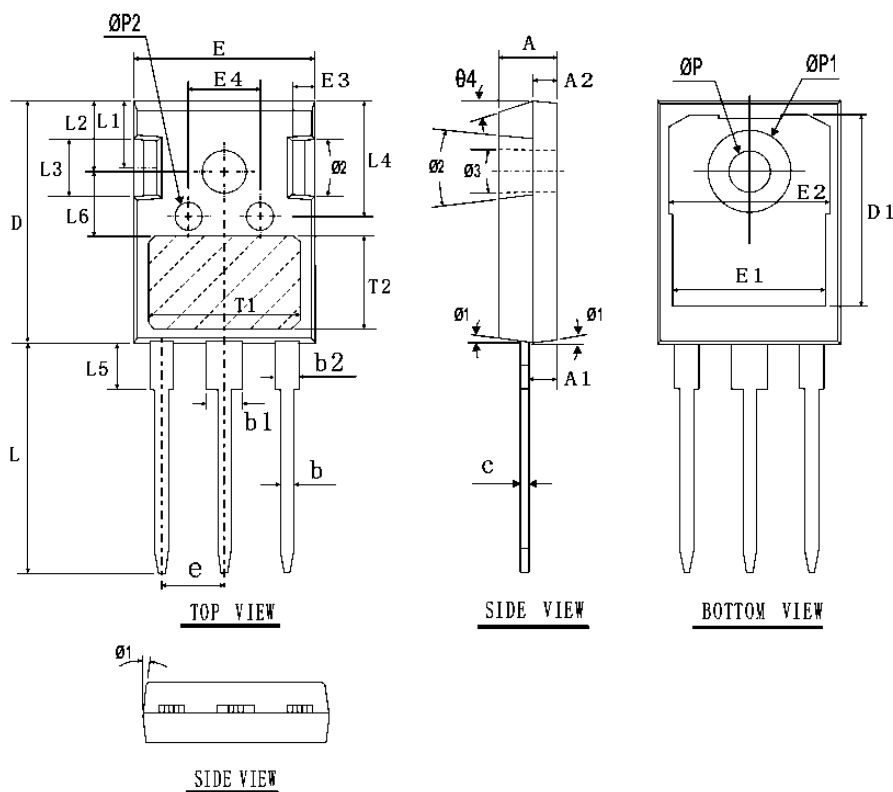


Figure10. Diode transient thermal impedance as a function of pulse width ($D = t_p/T$)

Mechanical Data:
Option1:
Unit:mm


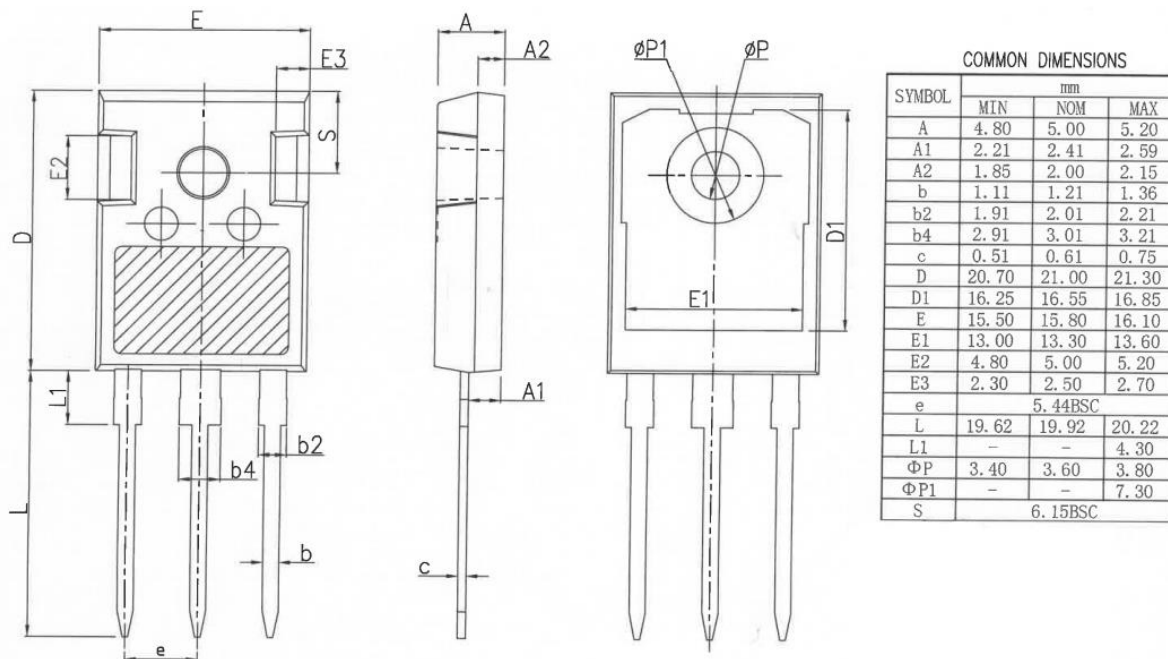
SYMBOL	mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
*b	1.15	1.20	1.25
*b1	1.95	2.10	2.25
*b2	2.95	3.10	3.25
*c	0.55	0.60	0.65
*D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
*E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
*e	5.40	5.44	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
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:


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