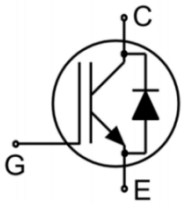
Main Product Characteristics:

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 °C	80	
I_{Cpuls}	Pulsed Collector Current，t_p limited by Tjmax	320	
-	Turn off safe operating area，V_{CE}=650V，T_J=175°C	320	
I_F	Diode Continuous Forward Current @T_C = 25 °C	160	A
	Diode Continuous Forward Current @T_C = 100 °C	80	
I_{FM}	Diode Maximum Forward Current	320	
P_D	Power Dissipation @ T_C = 25°C	469	W
	Power Dissipation @ T_C = 100°C	234	W
T_J T_{STG}	Operating Junction and Storage Temperature Range	-55 to +175	°C
T_L	Maximum Temperature for Soldering	260	°C

Thermal Resistance

Symbol	Characterizes	Typ.	Max.	Units
$R_{\theta JC}$	Thermal Resistance,Junction-to-case for IGBT	—	0.32	°C/W
	Thermal Resistance,Junction-to-case for Diode	—	0.44	°C/W
$R_{\theta JA}$	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 V_{DS} = 25V f = 1MHz
C_{oes}	Output capacitance	—	248	—		
C_{res}	Reverse transfer capacitance	—	151	—		
$t_{d(on)}$	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 VGE=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

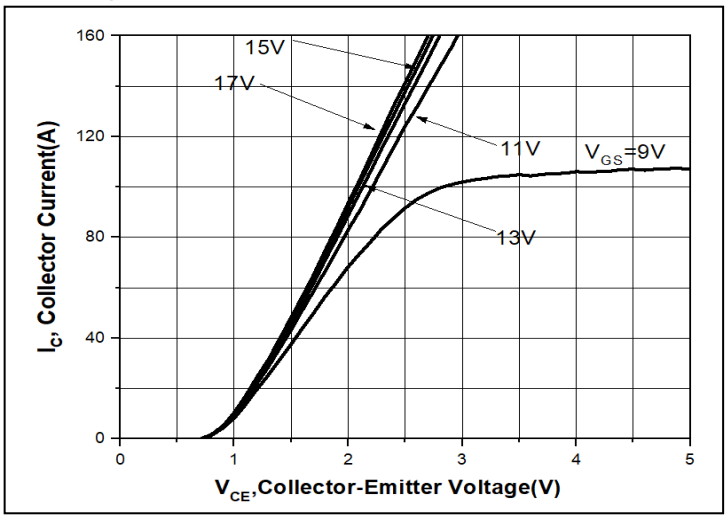


Figure1. Typical Output Characteristics

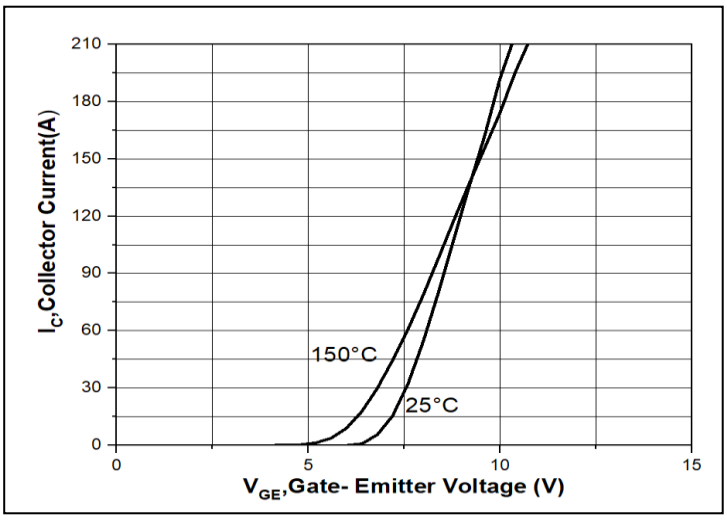


Figure2. Typical Transfer Characteristics

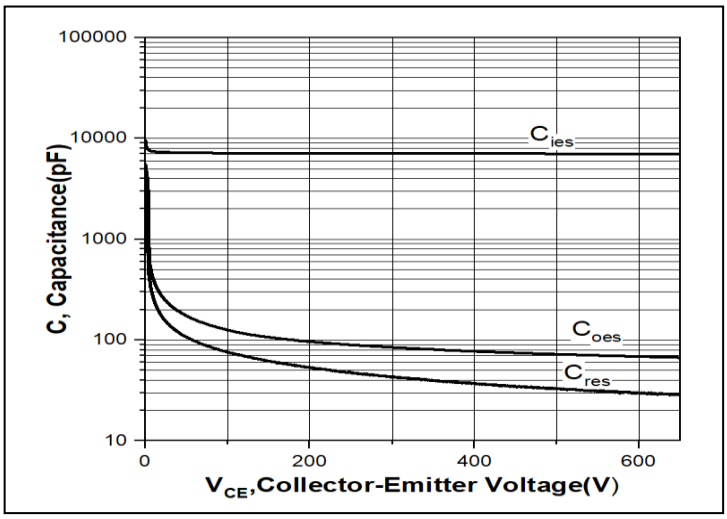


Figure3.Typical Capacitance

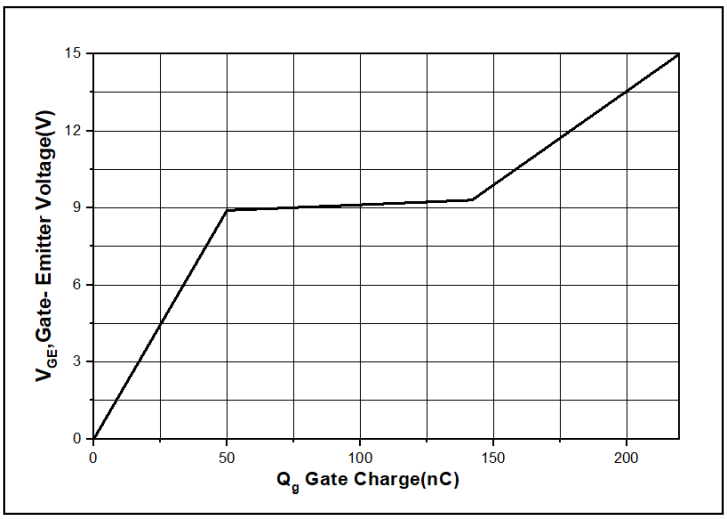


Figure4. Typical Gate Charge

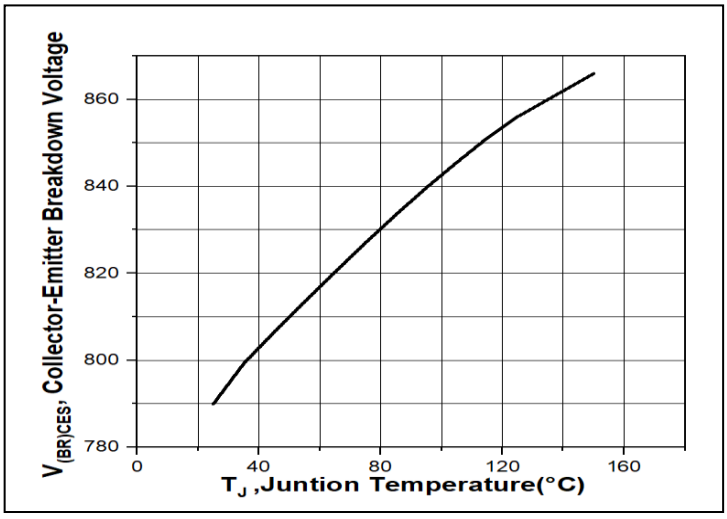


Figure5.Collector-Emitter Breakdown Voltage vs. Temperature

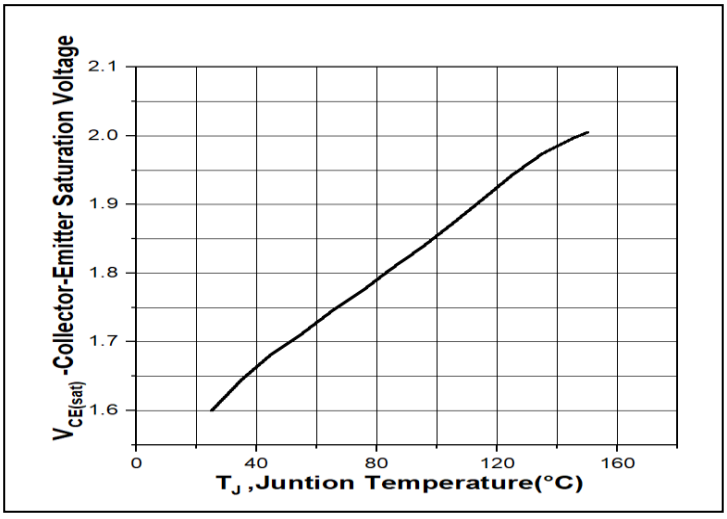


Figure6. Collector-Emitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

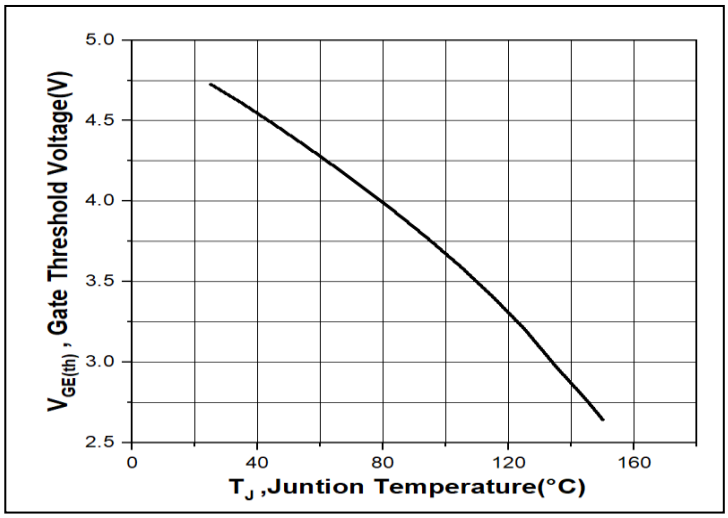


Figure7.Gate Threshold Voltage vs. Temperature

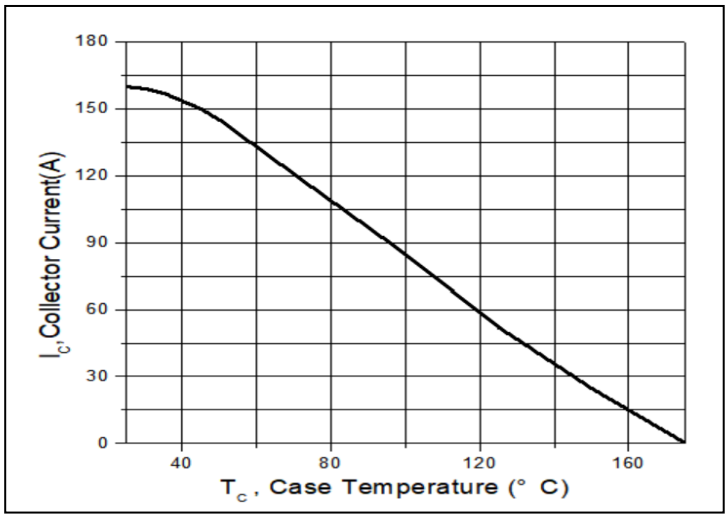


Figure8.Collector Current vs. Temperature

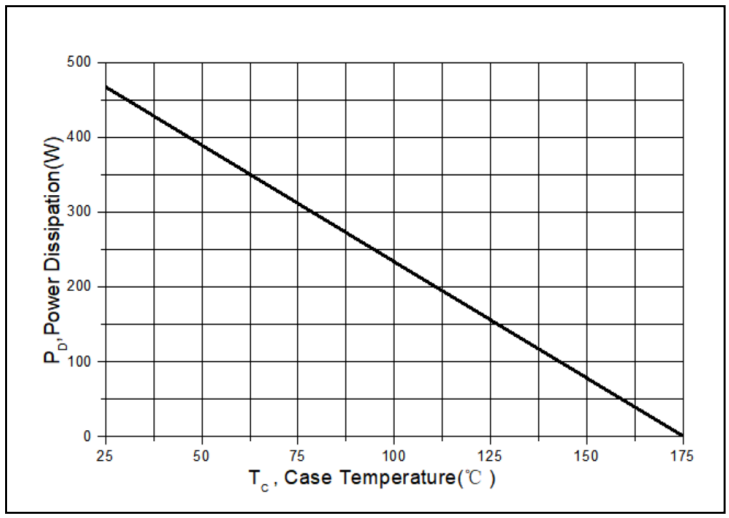


Figure9. Power Dissipation vs. Case Temperature

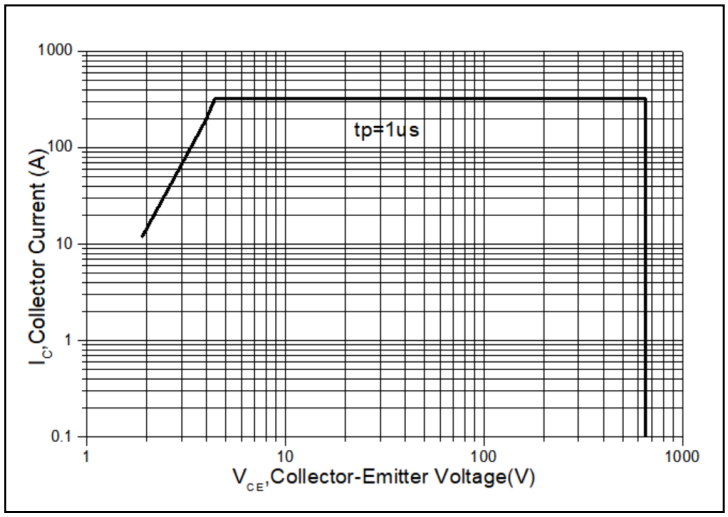
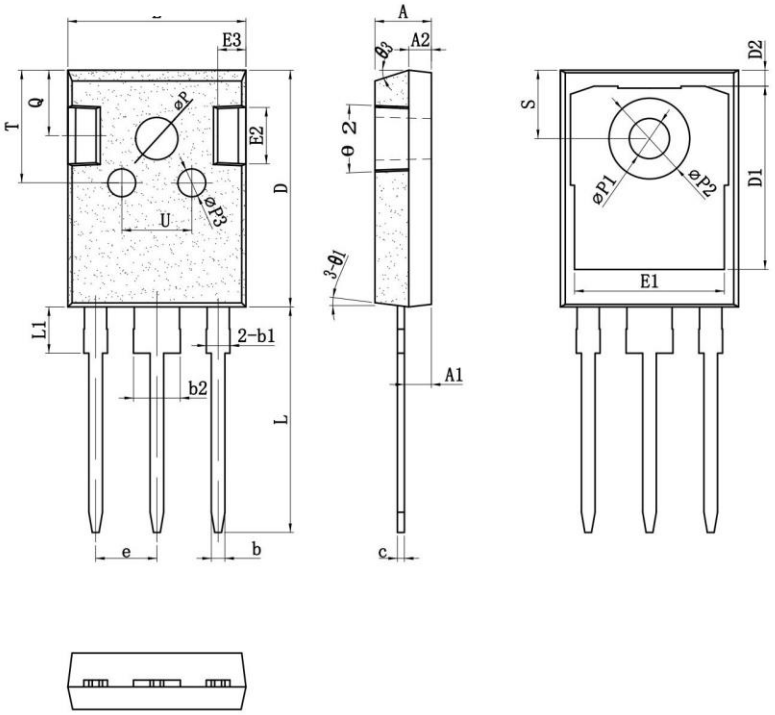


Figure10.Forward Bias Safe Operating Area

Mechanical Data：

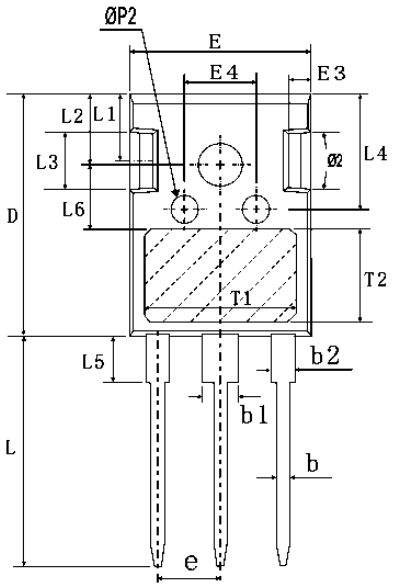
Option1:

Unit:mm

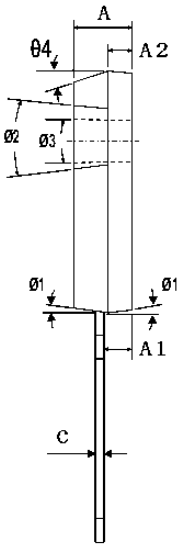


SYMBOL	mm		
	MIN	NOM	MAX
✱A	4.90	5.00	5.10
✱A1	2.31	2.41	2.51
A2	1.90	2.00	2.10
✱b	1.15	1.20	1.25
✱b1	1.95	2.10	2.25
✱b2	2.95	3.10	3.25
✱c	0.55	0.60	0.65
✱D	20.90	21.00	21.10
D1	16.35	16.55	16.75
D2	1.05	1.20	1.35
✱E	15.70	15.80	15.90
E1	13.10	13.25	13.40
E2	4.90	5.00	5.10
E3	2.40	2.50	2.60
✱e	5.40	5.44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

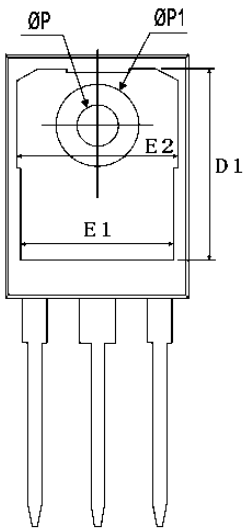
Option2:



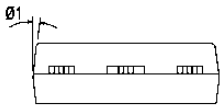
TOP VIEW



SIDE VIEW



BOTTOM VIEW

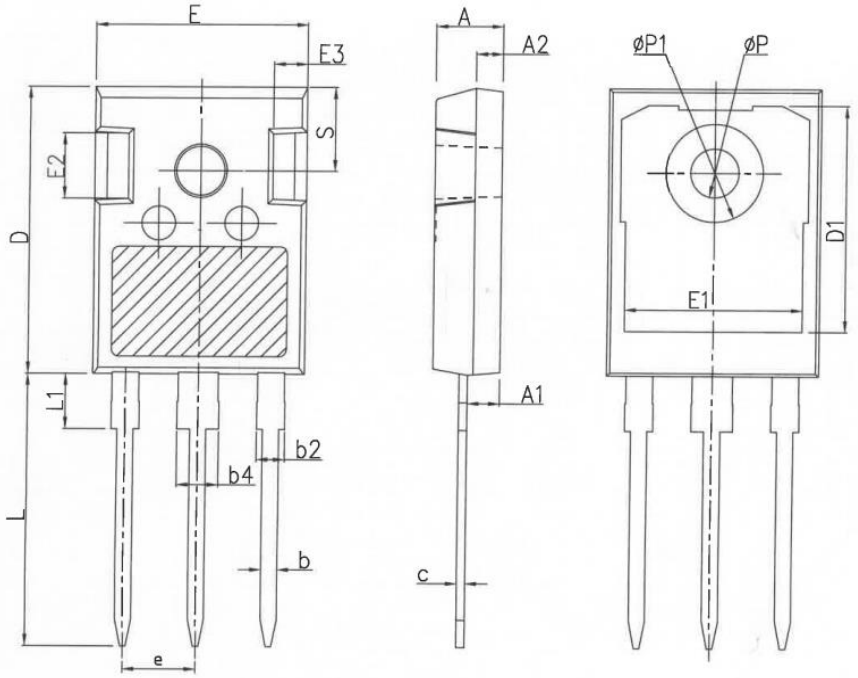


SIDE VIEW

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:



COMMON DIMENSIONS

SYMBOL	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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