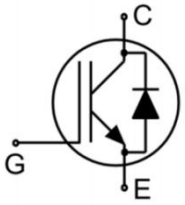
Main Product Characteristics:

V_{CES}	1250V
I_C	40A
$V_{CE(sat)}$	1.8V

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	1250	V
V_{GES}	Gate- Emitter Voltage	±30	V
I_C	Collector Current	80	A
	Collector Current @T_C = 100 °C	40	
I_{Cpuls}	Pulsed Collector Current，t_p limited by T_{jmax}	160	
-	Turn off safe operating area，V_{CE}=1200V，T_J=175°C	160	
I_F	Diode Continuous Forward Current @T_C = 100 °C	40	
I_{FM}	Diode Maximum Forward Current	160	
P_D	Power Dissipation @ T_C = 25°C	468	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	—	0.61	°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	1250	—	—	V	V_{GE}=0V,I_{CE}=1mA
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	—	1.8	2	V	I_C=40A ,V_{GE}=15V @T_J=25°C
		—	2.25	—		I_C=40A ,V_{GE}=15V @T_J=175°C
$V_{GE(th)}$	Gate Threshold Voltage	4.5	—	6	V	I_C=1.9mA,V_{CE}=V_{GE}
I_{CES}	Collector-Emitter Leakage Current	—	—	200	μA	V_{GE} =0V,V_{CE}=1200V
I_{GES}	Gate to Emitter Reverse Leakage	—	—	200	nA	V_{GE}=25V,V_{CE} =0V
		—	—	-200		V_{GE}=-25V,V_{CE} =0V
C_{ies}	Input capacitance	—	4700	—	pF	V_{GS} = 0V
C_{oes}	Output capacitance	—	106	—		V_{DS} = 50V
C_{res}	Reverse transfer capacitance	—	66	—		f = 1MHz
$t_{d(on)}$	Turn-on delay time	—	40	—	ns	V_{CC}=600V,
t_r	Rise time	—	23	—		V_{GE}=0.0/15.0V,
$t_{d(off)}$	Turn-Off delay time	—	350	—		R_G=10.0Ω,
t_f	Fall time	—	50	—		L_σ=70nH,
						C_σ=67pF
E_{on}	Turn-On Switching Loss	—	2.2	—	mJ	V_{CC}=600V,
E_{off}	Turn-Off Switching Loss	—	1.8	—		V_{GE}=0.0/15.0V,
E_{ts}	Total Switching Loss	—	4	—		R_G=10.0Ω,
						L_σ=70nH,
						C_σ=67pF
Q_g	Total Gate Charge	—	238	—	nC	V_{CC}=480V, I_C=40A,
Q_{ge}	Gate to Emitter Charge	—	40	—		V_{GE}=15V
Q_{gc}	Gate to Collector Charge	—	135	—		

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

Symbol	Parameter	Min.	Typ.	Max.	Units	Conditions
V_{FM}	Diode Forward Voltage	—	2.3	3	V	I_F=40A,V_{GE}=0V
t_{rr}	Reverse Recovery Time	—	320	—	ns	T_J = 25°C, I_F =40A, di/dt = 700A/μs
Q_{rr}	Reverse Recovery Charge	—	2.6	—	μC	
I_{RRM}	Diode Peak Reverse Recovery Current	—	19	—	A	

Typical Electrical and Thermal Characteristics

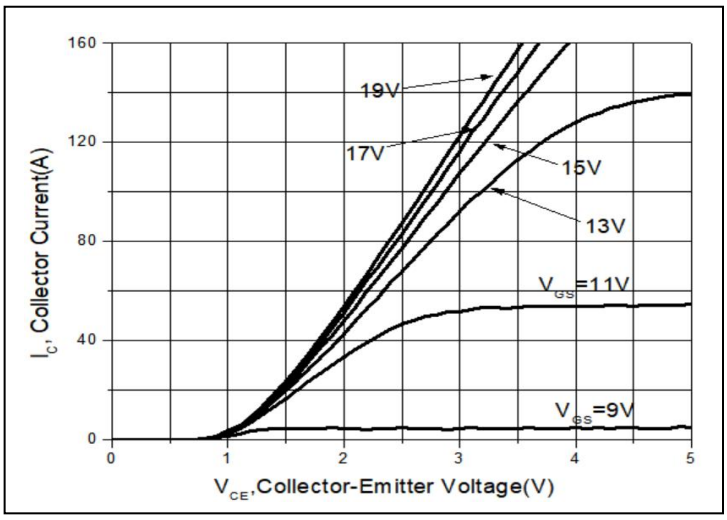


Figure1. Typical Output Characteristics

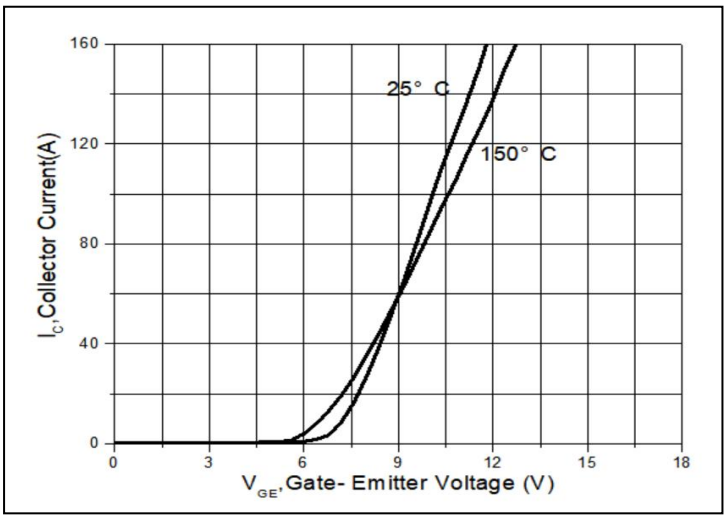


Figure2. Typical Transfer Characteristics

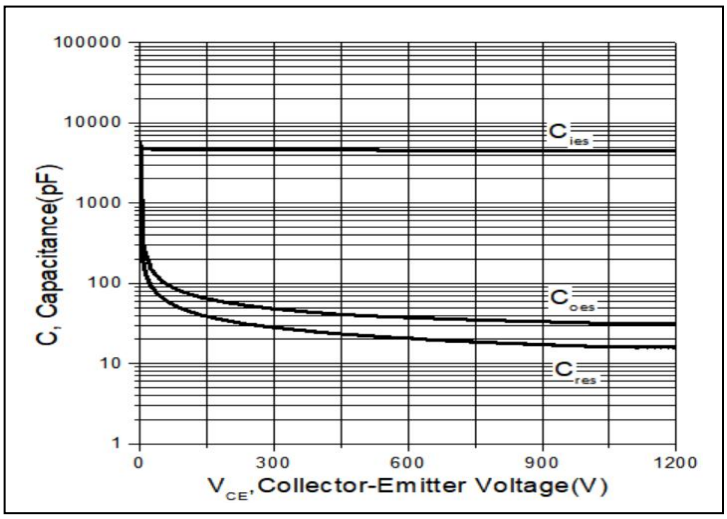


Figure3.Typical Capacitance

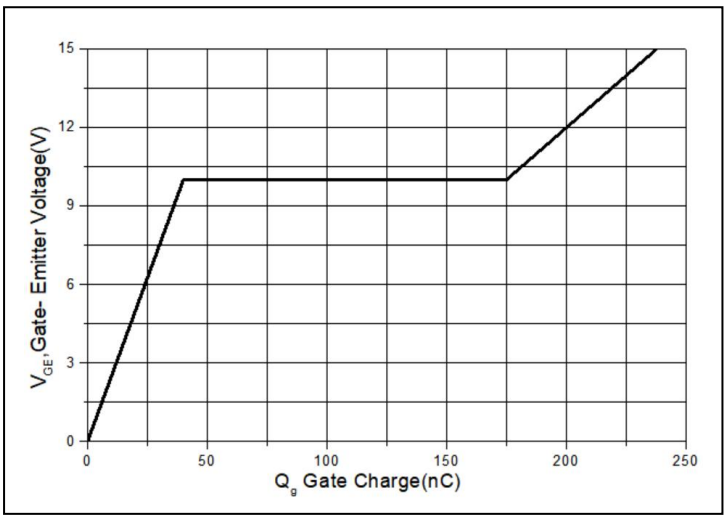


Figure4. Typical Gate Charge

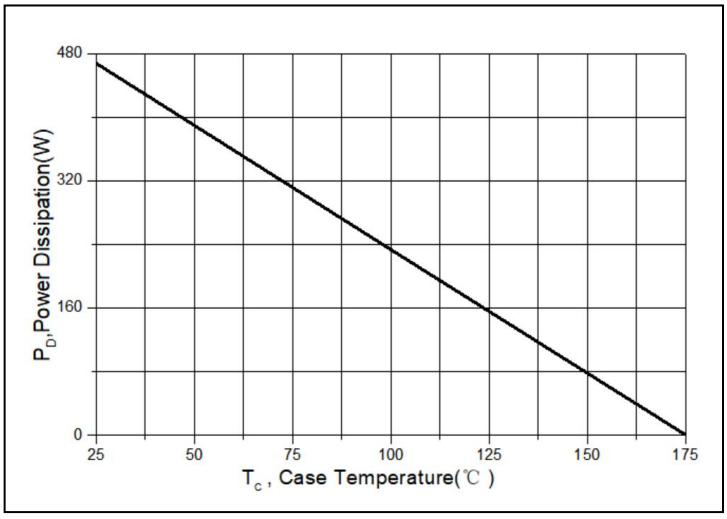


Figure5. Power Dissipation vs. Case Temperature

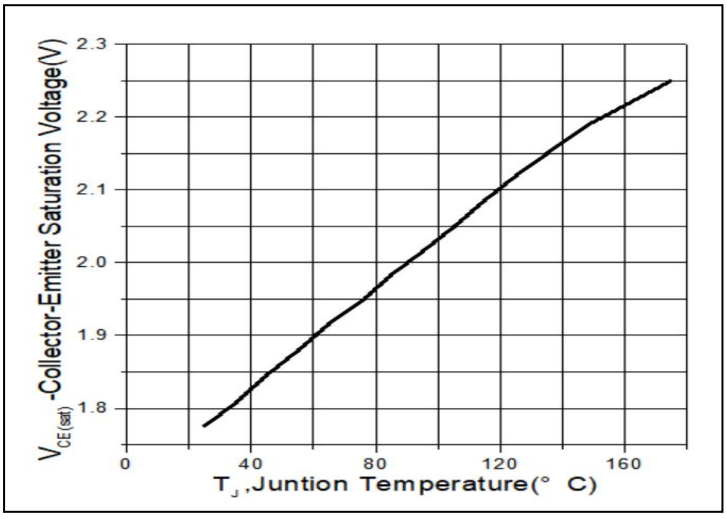


Figure6. Collector-Emitter Saturation Voltage vs. Temperature

Typical Electrical and Thermal Characteristics

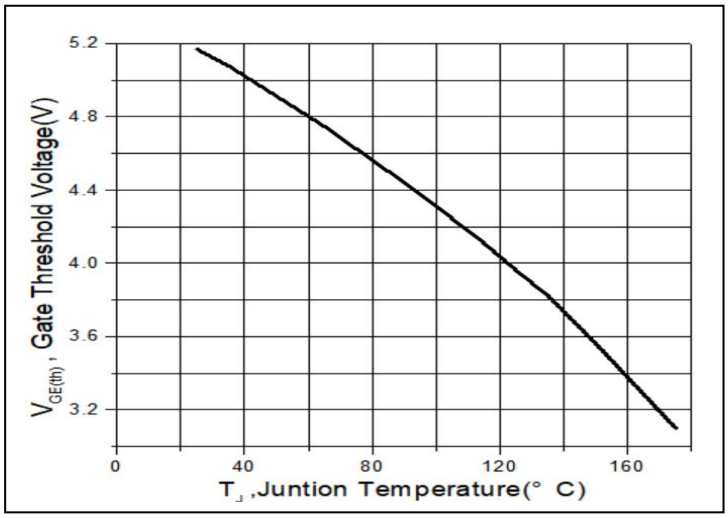


Figure7. Gate Threshold Voltage vs. Temperature

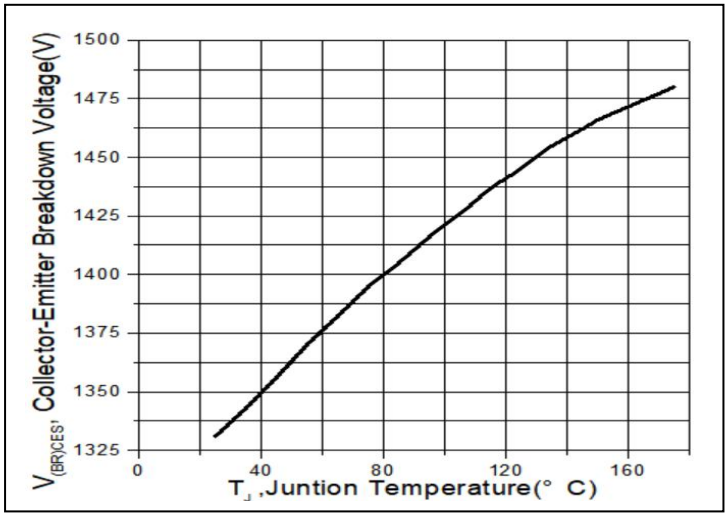
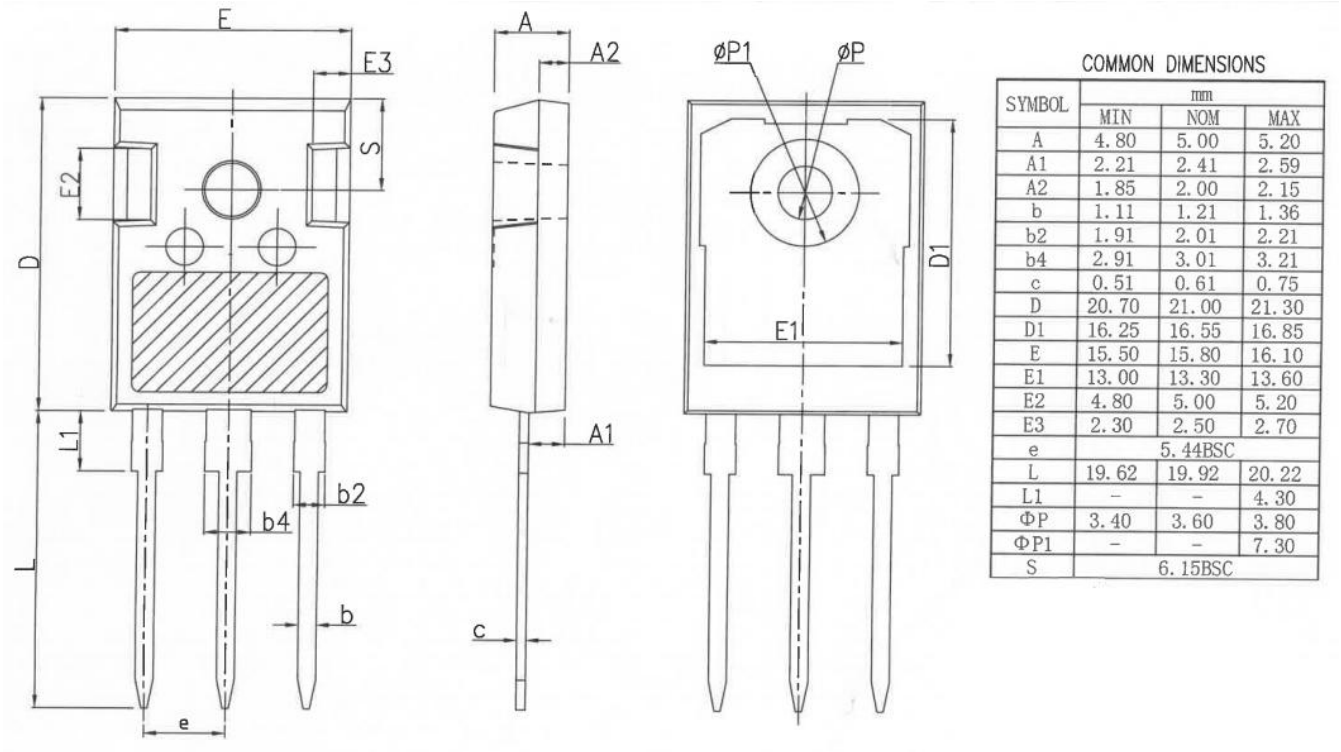


Figure8. Collector-Emitter Breakdown Voltage vs. Temperature

Mechanical Data：

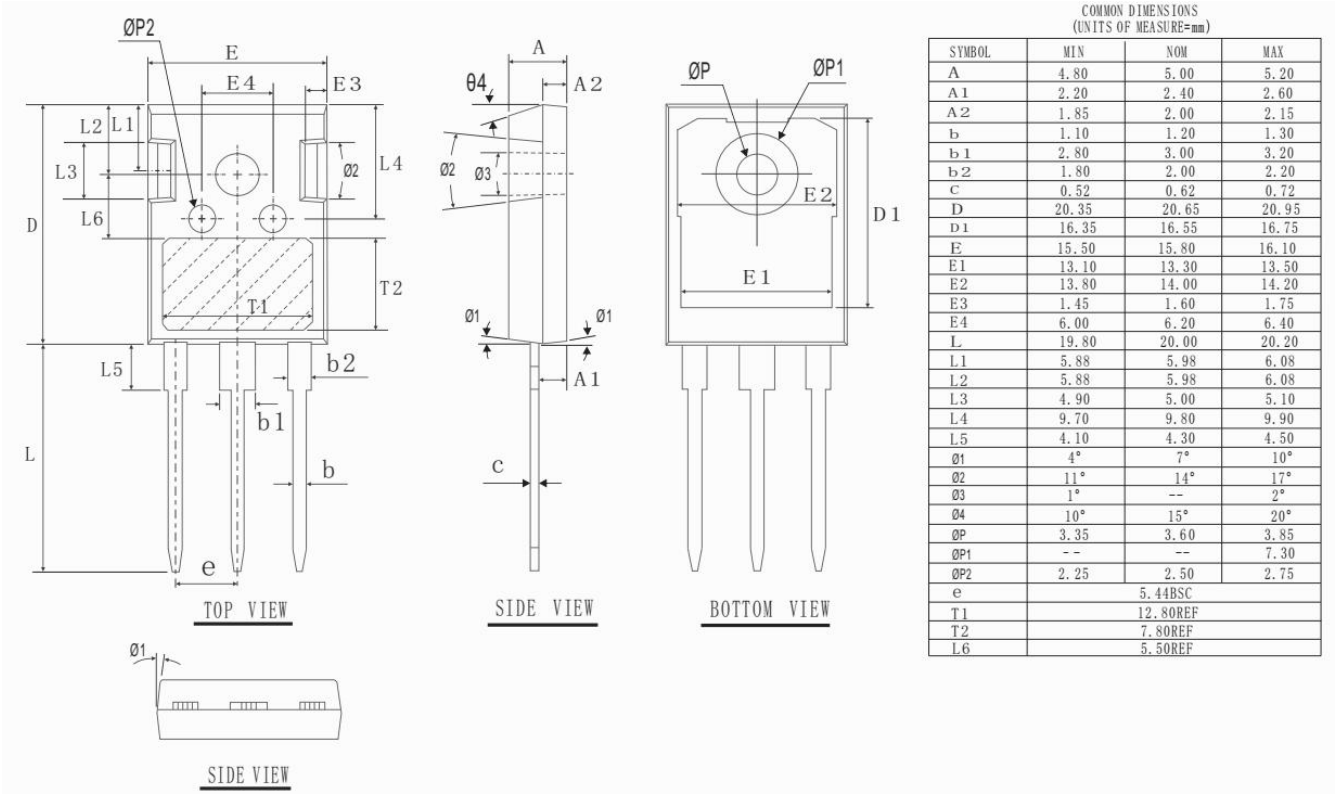
Option1:



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		

Option2:

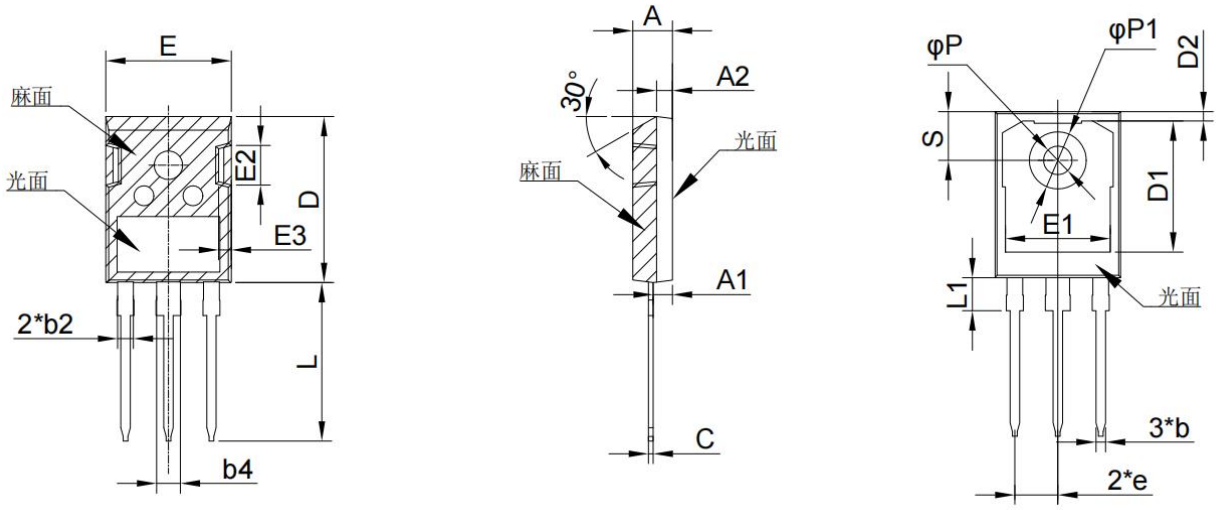


COMMON DIMENSIONS
(UNITS OF MEASURE=mm)

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:

Unit:mm



TO247-3L							
	Min	Typ	Max		Min	Typ	Max
A	4.7	5.00	5.20	E1	13.2	13.5	13.8
A1	2.30	2.40	2.50	E2	4.90	5.00	5.10
A2	1.90	2.00	2.10	E3	1.50	1.60	1.70
b	1.10	1.20	1.30	e	5.34	5.44	5.54
b2	1.80	2.00	2.20	L	19.80	20.00	20.32
b4	2.80	3.00	3.20	L1		4.17	4.50
C	0.5	0.6	0.7	P	3.50	3.60	3.70
D	20.8	20.95	21.1	P1	7.00	7.19	7.40
D1	16.25	16.55	16.85	S	6.04	6.15	6.3
D2	0.95	1.17	1.35				
E	15.48	15.88	16.28				

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