

**CGR75N120F2KAD**

V_{CE}	I_C ($T_C=100^{\circ}C$)	$V_{CE(sat)}$
1200V	75A	1.65V

TO-247PLUS**DESCRIPTION**

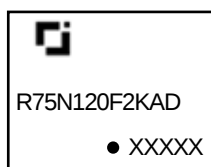
The CGR75N120F2KAD is used JSCJ's second generation IGBT technology, has advanced Trench and FS (Field Stop) Structure, it's with very low Collector-Emitter Saturation Voltage, can easy to use in parallel.

Features

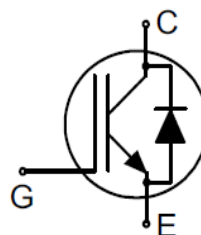
- 1200V breakdown Voltage
- Low $V_{ce(sat)}$ and positive temperature coefficient
- Low switching loss
- With fast and soft recovery freewheeling diode
- Good EMI behavior

Application

- Solar
- UPS & FPC applications
- Welder
- Energy storage

MARKING

R75N120F2KAD = Device code
Solid dot = Green molding compound device, if none, the normal device
XXXX = Code

EQUIVALENT CIRCUIT

Order Code	Package	Marking	Parking
CGR75N120F2KAD	TO-247PLUS	R75N120F2KAD	Tube

Absolute Maximum Ratings ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
V_{CES}	Collector-Emitter Voltage	1200	V
V_{GES}	Gate-Emitter Voltage	± 20	V
	Gate-Emitter transient voltage	± 30	V
I_C	Collector Current, Limited by T_{Jmax}	120	A
	Collector Current @ $T_C=100^{\circ}\text{C}$	75	
I_{Cpluse}	Plused Collector Current, tp limited by T_{Jmax}	225	A
$I_{LM}^{(1)}$	Turn-off latching current	225	A
I_F	Continuous Diode Forward Current, Limited by T_{Jmax}	120	A
	Continuous Diode Forward Current @ $T_C=100^{\circ}\text{C}$	75	A
I_{FM}	Diode Pulsed Current, Limited by T_{Jmax}	225	A
P_D	Power Dissipation @ $T_C=25^{\circ}\text{C}$	395	W
	Power Dissipation @ $T_C=100^{\circ}\text{C}$	197	
T_J	Operating Junction Temperature	-40 to 175	$^{\circ}\text{C}$
T_{STG}	Storage Temperature	-55 to 150	$^{\circ}\text{C}$
T_L	Maximum lead temperature for soldering	260	$^{\circ}\text{C}$

(1) $V_{oc}=600\text{V}$, $V_{GE}=15\text{V}$, $T_J \leq 150^{\circ}\text{C}$.**Thermal Characteristics**

Symbol	Parameter	Value	Units
$R\theta_{JC}$	Maximum IGBT Junction-to-Case	0.38	$^{\circ}\text{C}/\text{W}$
$R\theta_{JC}$	Maximum Diode Junction-to-Case	1.1	$^{\circ}\text{C}/\text{W}$
$R\theta_{JA}$	Maximum Junction-to-Ambient	40	$^{\circ}\text{C}/\text{W}$

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Ration			Unit s
			Min.	Typ.	Max.	
STATIC PARAMETERS						
V _{(BR)CES}	Collector-Emitter Breakdown Voltage	V _{GE} =0V,I _{CE} =250uA	1200	--	--	V
I _{CES}	Zero Gate Voltage Collector Current	V _{GE} =0V,V _{CE} =1200V	--	--	1.0	mA
I _{GES}	Gate-Emitter leakage current	V _{GE} =±20V	--	--	±250	nA
		V _{GE} =±30V	--	--	±500	nA
V _{GE(th)}	Gate-Emitter Threshold Voltage	I _C =250uA ,V _{CE} =V _{GE}	4.5	--	7.5	V
V _F	Diode Forward Voltage	I _F =75A,T _J =25℃	--	2.1	--	V
		I _F =75A,T _J =125℃	--	1.8	--	V
		I _F =75A,T _J =150℃	--	1.7	--	V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C =75A,V _{GE} =15V, T _J =25℃	--	1.65	--	V
		I _C =75A,V _{GE} =15V, T _J =125℃	--	2.1	--	V
		I _C =75A,V _{GE} =15V, T _J =150℃	--	2.2	--	V
DYNAMIC PARAMETERS						
C _{ies}	Input Capacitance	V _{CE} =30V,V _{GE} =0V f=1MHz	--	7239	--	pF
C _{oes}	Output Capacitance		--	269	--	
C _{res}	Reverse Transfer Capacitance		--	60.0	--	
R _g	Gate Resistance	V _{GE} =0V, V _{CC} =0V, f=1MHz	--	0.88	--	Ω
Q _G	Total Gate Charge	V _{CE} =960V, I _C =75 A, V _{GE} =15V	--	348	--	nC
Q _{GE}	Gate to Emitter Charge		--	85.1	--	nC
Q _{GC}	Gate to Collector Charge		--	194	--	nC
SWITCHING PARAMETERS						
t _{d(on)}	Turn-On Delay Time	V _{CE} =600V, I _C =75A, R _g =10Ω, V _{GE} =15V, Inductive Load T _J =25℃	--	64	--	ns
t _r	Current Rise Time		--	80	--	
t _{d(off)}	Turn-Off Delay Time		--	245	--	
t _f	Current Fall Time		--	63	--	
E _{on} ⁽³⁾	Turn-On Switching Energy		--	6.0	--	mJ
E _{off}	Turn-Off Switching Energy		--	2.6	--	
E _{ts}	Total Switching Energy		--	8.6	--	

(3) Including the reverse recovery of the diode.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

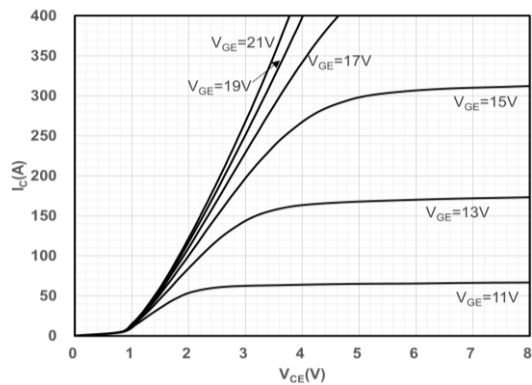


Figure 1: Output Characteristic
($T_j=25^{\circ}\text{C}$)

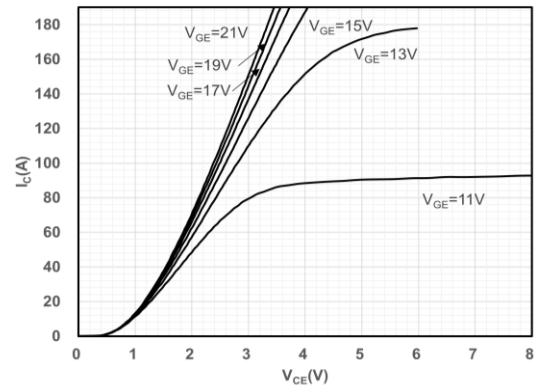


Figure 2: Output Characteristic
($T_j=150^{\circ}\text{C}$)

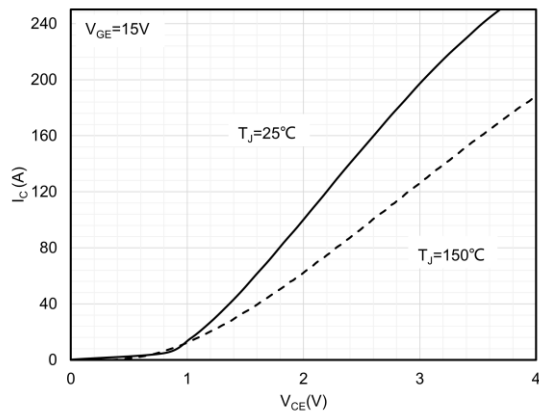


Figure 3: Collector-Emitter Saturation Voltage

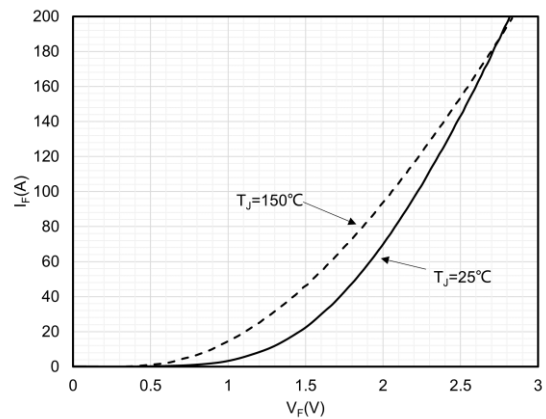


Figure 4: Diode Characteristic

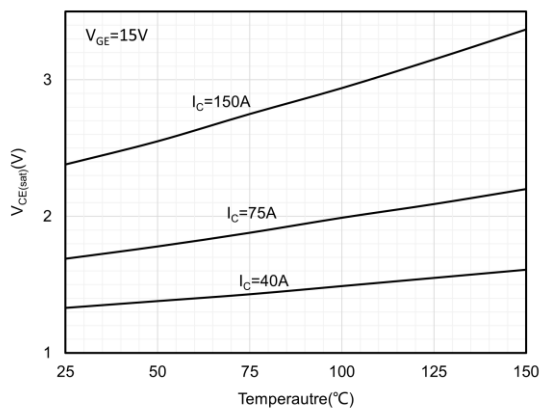


Figure 5: Collector-Emitter Saturation Voltage vs.
Junction Temperature

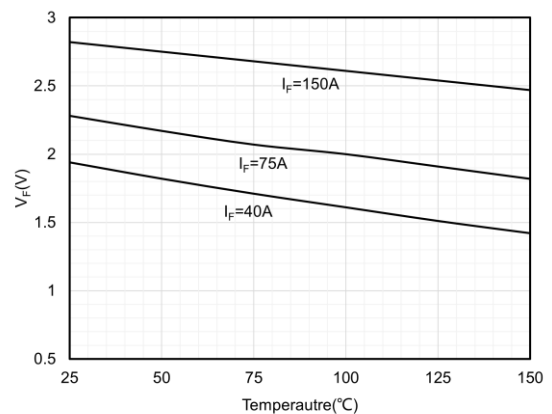


Figure 6: Diode Forward voltage vs. Junction
Temperature

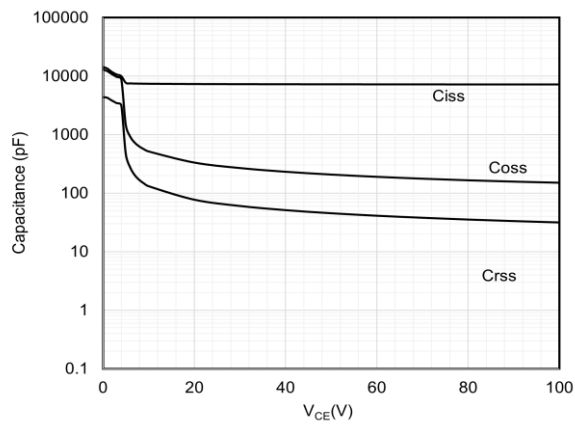


Figure 7: Capacitance Characteristic

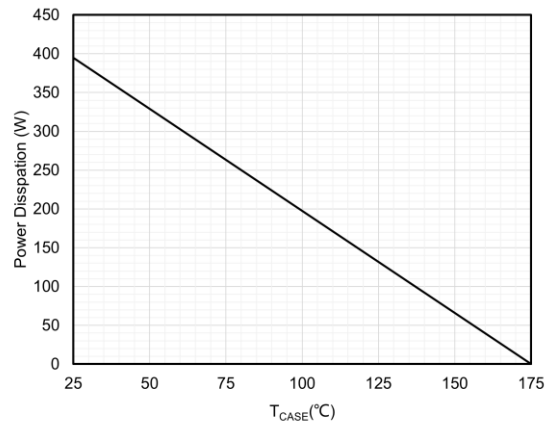


Figure 8: Power Dissipation as a Function of T_{CASE}

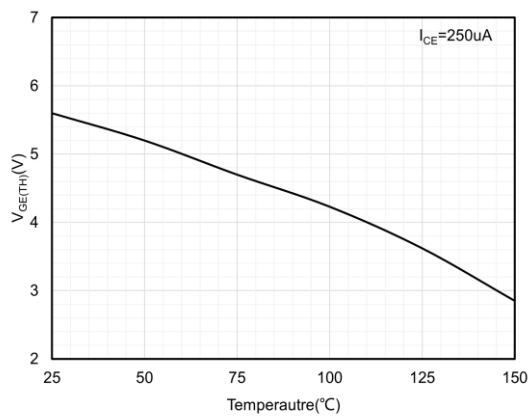


Figure 9: $V_{GE(TH)}$ vs. T_J

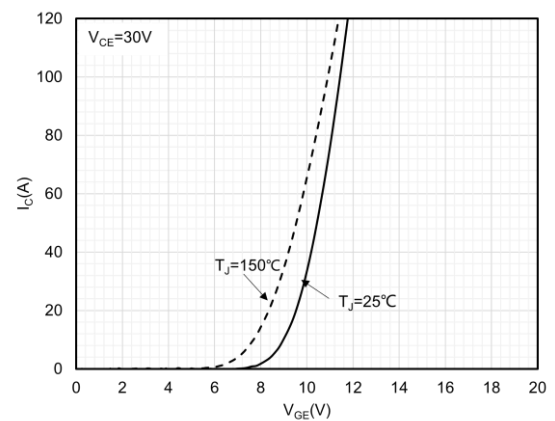


Figure 10: Transfer Characteristic

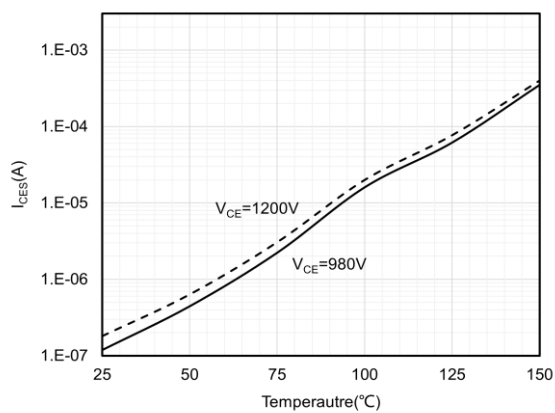


Figure 11: Reverse Leakage Current vs. T_J

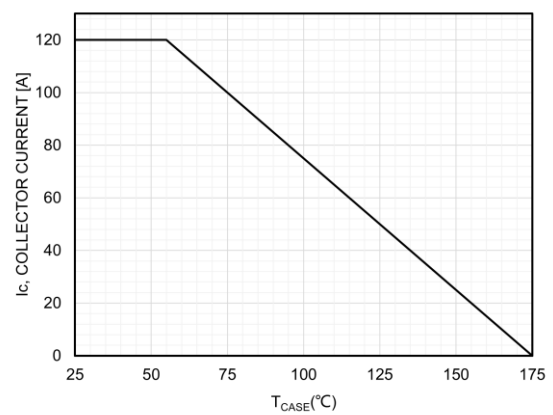


Figure 12: Collector Current vs. T_{CASE}

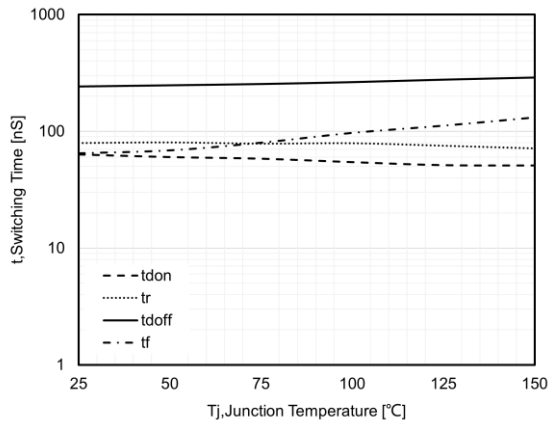


Figure 13: Typical Switching times as a function of Junction Temperature

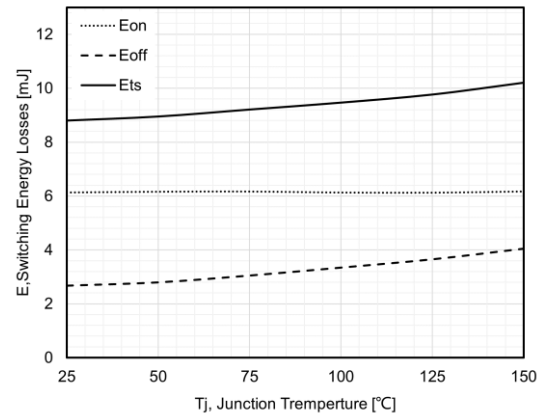


Figure 14: Typical Switching losses as a function of Junction Temperature

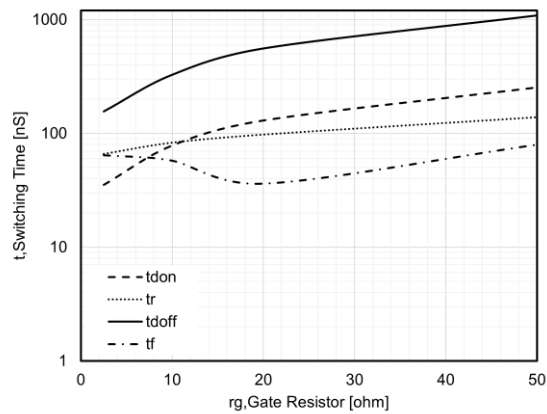


Figure 15: Typical Switching Times as a function of gate resistor

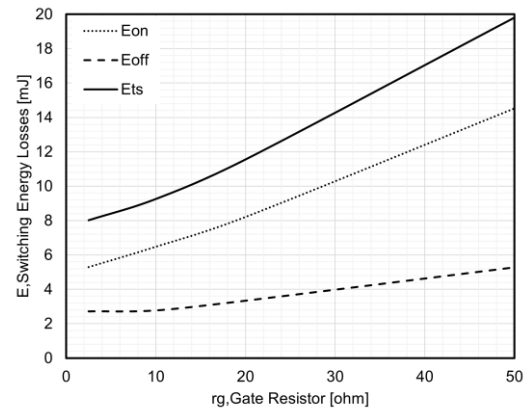


Figure 16: Typical Switching Energy losses as a function of gate resistor

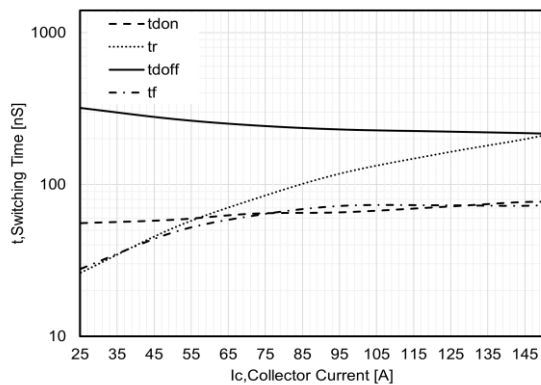


Figure 17: Typical Switching Times as a function of Collector Current

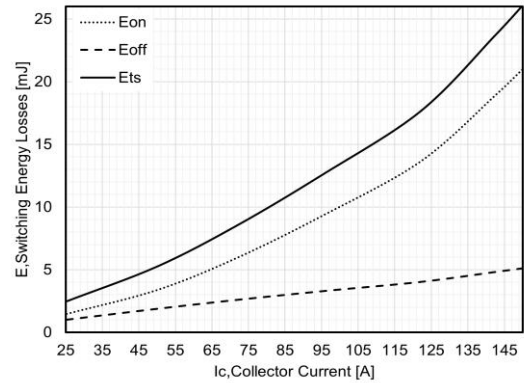
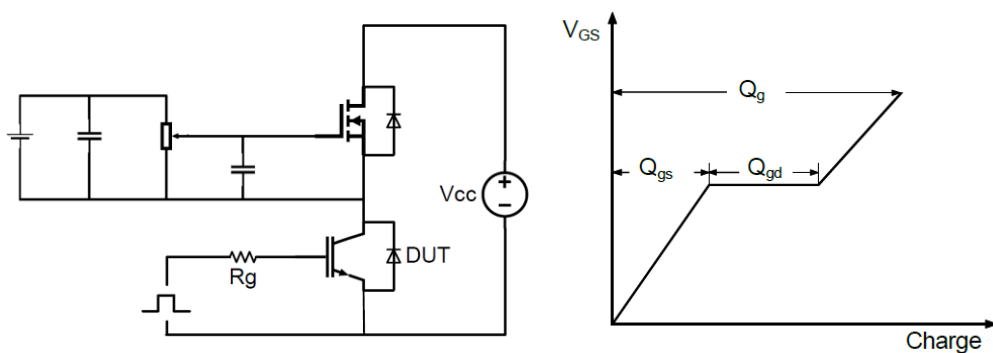


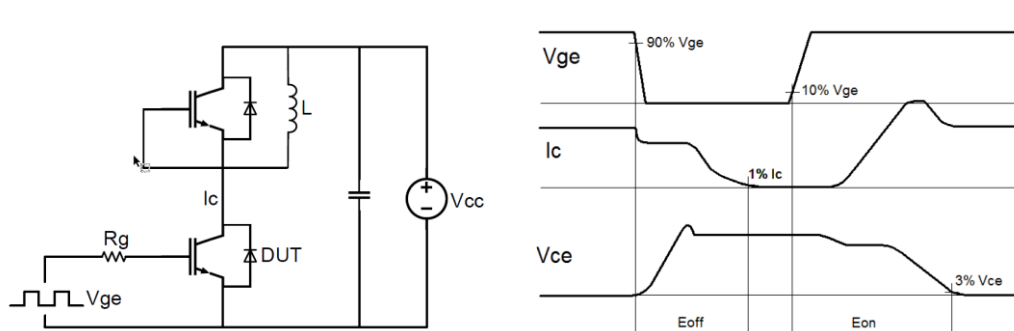
Figure 18: Typical Switching losses as a function of Collector Current

TEST CIRCUIT AND WAVEFOMRS

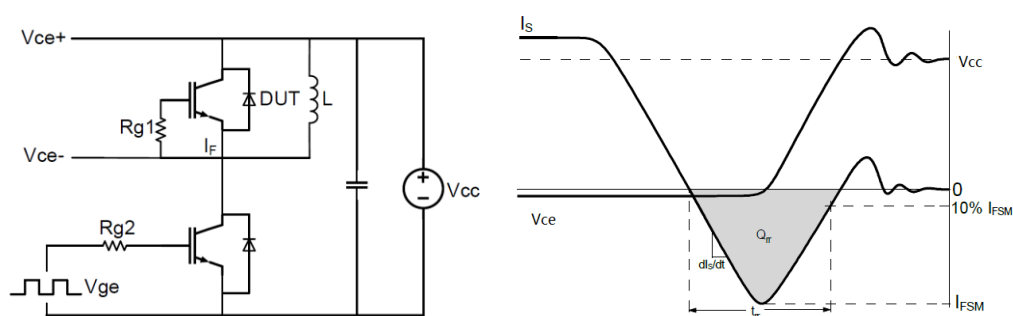
Gate Charge



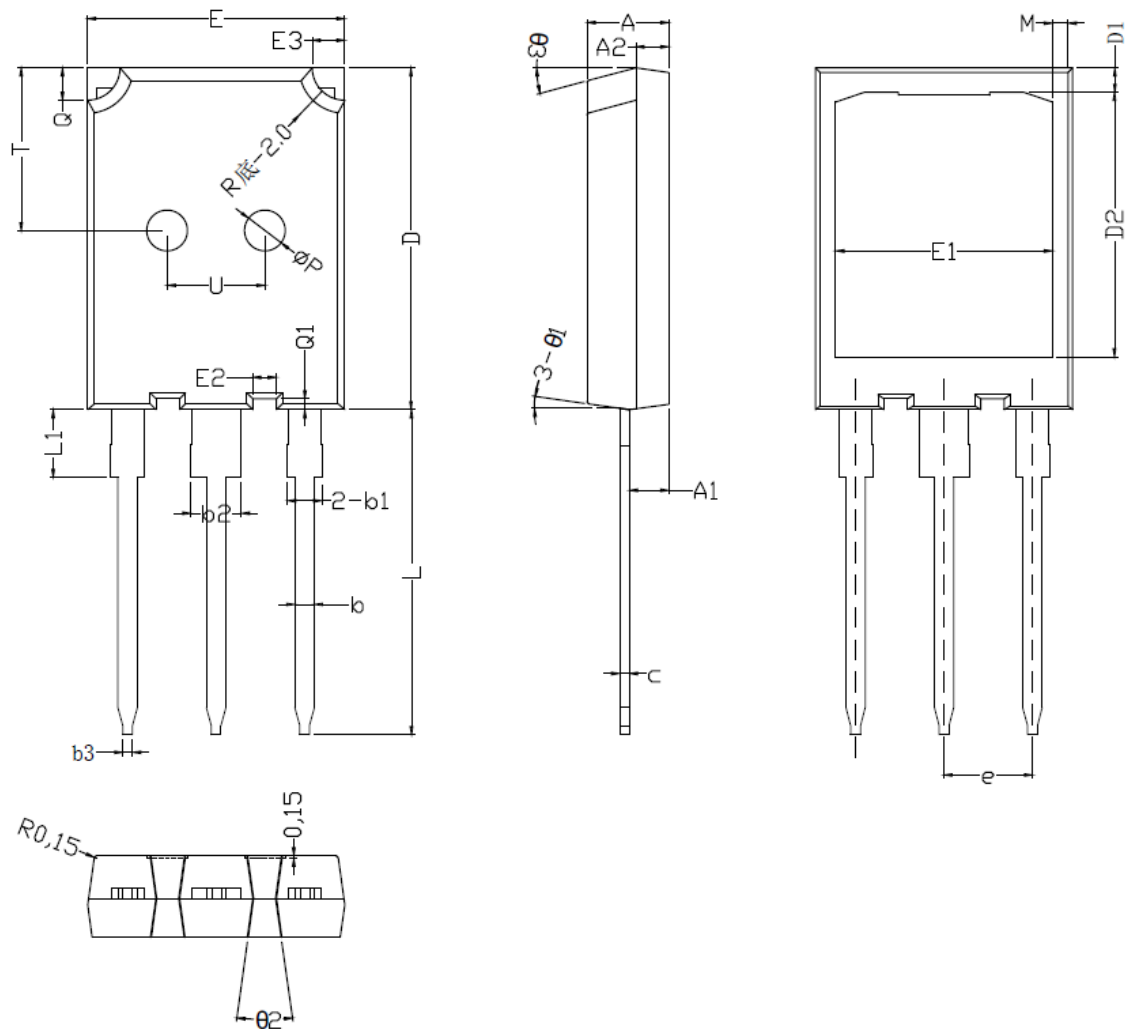
Inductive Switching Test Circuit



Diode Reverse Recovery



TO-247PLUS PACKAGE OUTLINE DIMENSIONS



SYMBOL	mm		
	MIN	NOM	MAX
*A	4.90	5.00	5.10
*A1	2.30	2.40	2.50
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
b3	0.45	0.60	0.75
*c	0.55	0.60	0.68
*D	20.90	21.00	21.10
D1	1.00	1.20	1.40

D2	16.05	16.35	16.65
*E	15.70	15.80	15.90
E1	13.10	13.30	13.50
E2	1.25	1.45	1.65
E3	1.80	2.00	2.20
*e	5.40	5.44	5.48
*L	19.80	19.92	20.10
*L1	-	-	4.30
M	0.50	0.70	0.90
ΦP	2.30	2.50	2.70
Q	1.80	2.00	2.20
Q1	0.50	0.68	0.80
T	9.80	10.00	10.20
U	5.80	6.00	6.20
θ1	5°	7°	9°
θ2	13°	16°	19°
θ3	13°	15°	17°
*为管控尺寸			