RECTRON SEMICONDUCTOR
TECHNICAL SPECIFICATION

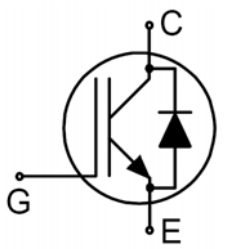
RI15N1200TP

Insulated-Gate Bipolar Transistor in a TO-3P Plastic Package.

Features

Low gate charge,, Low saturation voltage ,
Positive temperature coefficient, RoHS product.

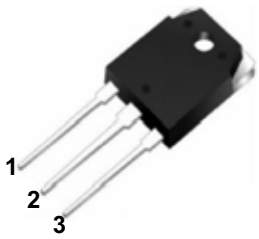
Equivalent Circuit



Applications

General purpose inverter, Frequency converters, Induction Heating(IH), Uninterrupted Power Supply(UPS).

Pinning



PIN1：Gate
PIN 2：Collector
PIN 3：Emitter

Absolute Maximum Ratings(Ta=25 ℃)

Parameter	Symbol	Rating	Unit
Collector-emitter voltage	V_{CES}	1200	V
Gate-emitter voltage	V_{GES}	±20	V
Short circuit withstand time	T_{SC}	10	μs
Collector current	I_C	30	A
Collector current@T_C=100℃		15	A
Collector peak current, T_P limited by T_{JMAX}	I_{CM}	45	A
Diode forward current@T_C=100℃	I_F	15	A
Diode maximum forward current	I_{FM}	45	A
Power dissipation(T_C=25℃)	P_D	150	W
Operating junction and storage temperature range	T_J, T_{stg}	-55～150	℃
Maximum temperature for soldering	T_L	300	℃
IGBT thermal resistance,junction-case	$R_{th(j-c)}$	0.63	℃/W
Diode thermal resistance,junction-case	$R_{th(j-c)}$	2.88	℃/W
Thermal resistance,junction-ambient	$R_{th(j-a)}$	40	℃/W

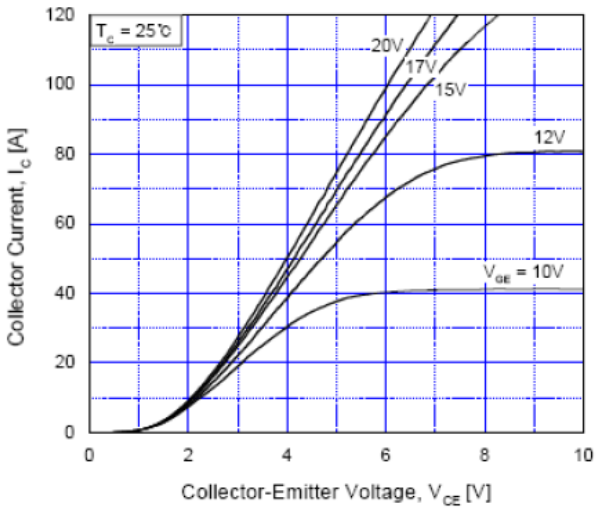
Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	V_{CES}	V_{GE}=0V; I_{CE}=500uA	1200	-	-	V
Breakdown Voltage Temperature Coefficient	$\triangle BV_{CES}/\triangle T_J$	I_{CE}=1mA;reference to 25℃		0.6		V/℃
Zero gate voltage Collector current	I_{CES}	V_{GE}=0V;V_{CE}=1200V Tc=25℃	-	-	0.2	mA
		Tc=100℃			2	mA
		Tc=150℃			2.5	mA
Gate-body leakage current	I_{GES}	V_{GE}=±20V;V_{CE}=0V	-	-	±100	nA
Gate threshold voltage	$V_{GE(th)}$	I_C=600μA;V_{CE}=V_{GE}	4.5		6.5	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	I_C=15A; V_{GE}=15V Tc=25℃	-	2	2.5	V
		Tc=100℃		2.2		V
		Tc=150℃		2.3		V
Forward Transconductance	g_{fs}	V_{CE}=20V;I_C=15A		10		S
Short Collector current	$I_{C(SC)}$	V_{GE}=15V;V_{CE}=600V; tsc＜10μs Tc=25℃		90		A
Input capacitance	C_{ies}	V_{CE}=25V,V_{GE}=0V,f=1MHz	-	1330	2000	pF
Output capacitance	C_{oes}		-	128	200	
Reverse transfer capacitance	C_{res}		-	88	140	

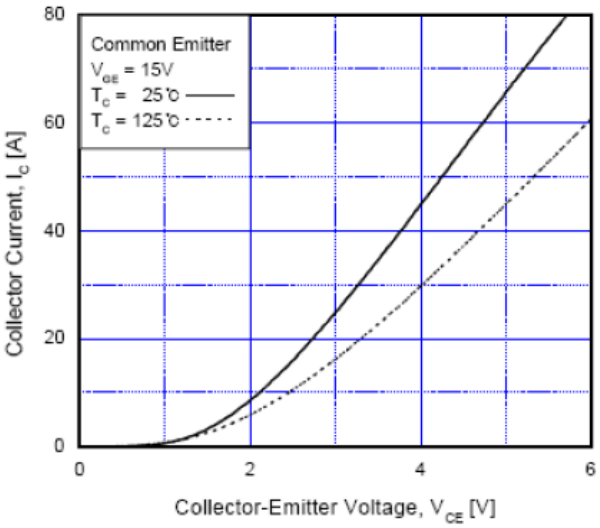
Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-on delay time	$t_{d(ON)}$	V_{CE}=600V I_C=15A R_G=56Ω Tc=25℃	-	70	-	ns
Rise time	t_r		-	150	-	
Turn-off delay time	$t_{d(OFF)}$		-	300	-	
Fall time	t_f		-	80	-	
Turn-On Switching Loss	E_{on}		-	2.3	-	mJ
Turn-Off Switching Loss	E_{off}		-	1.3	-	
Total Switching Loss	E_{ts}		-	3.6	-	
Total gate charge	Q_G	V_{CE}=600V I_C=15A V_{GE}=15V	-	130	180	nC
Gate-emitter charge	Q_{G-E}		-	15	22	
Gate-collector charge	Q_{G-C}		-	50	65	
Diode forward voltage	V_F	I_F=15A	-		1.7	V
Reverse recovery time	Trr	V_{GE}=0V, VR=800V I_F=10A di/dt=750A/μS	-	150		ns
Reverse recovery charge	Qrr		-	1200		nC

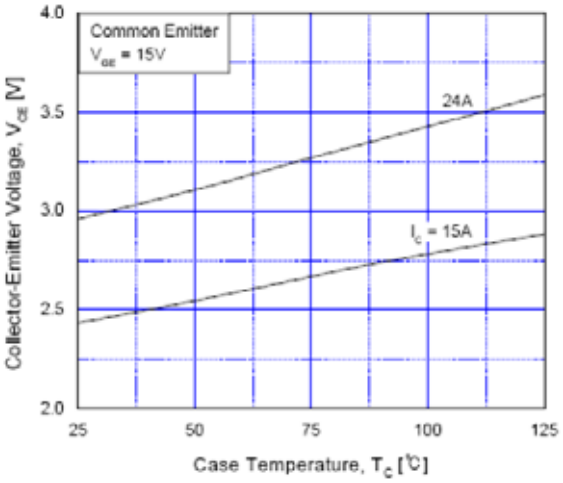
RATING AND CHARACTERISTICS CURVES (RI15N1200TP)



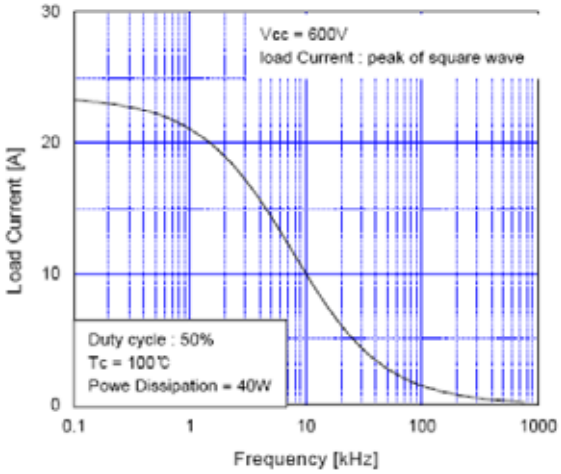
1.Typical Output Characteristics



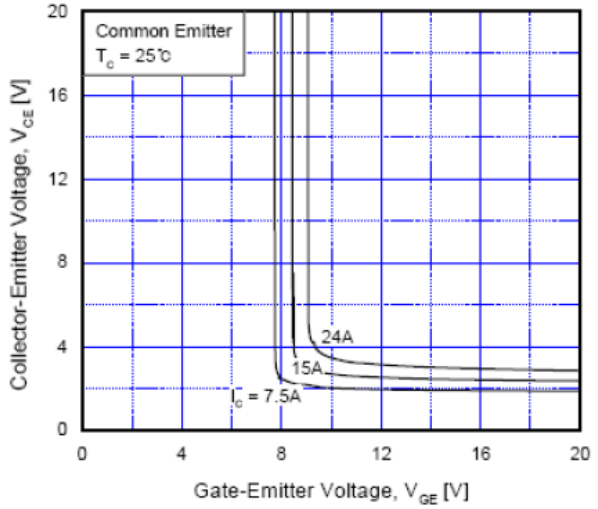
2.Typical Saturation Voltage Characteristics



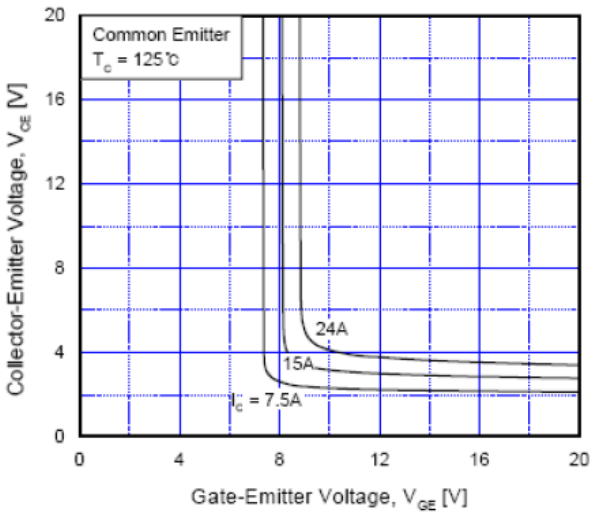
3.Saturation Voltage vs. Case Temperature at Variant Current Level



4.Load Current vs. Frequency



5.Saturation Voltage vs. VGE



6.Saturation Voltage vs. VGE

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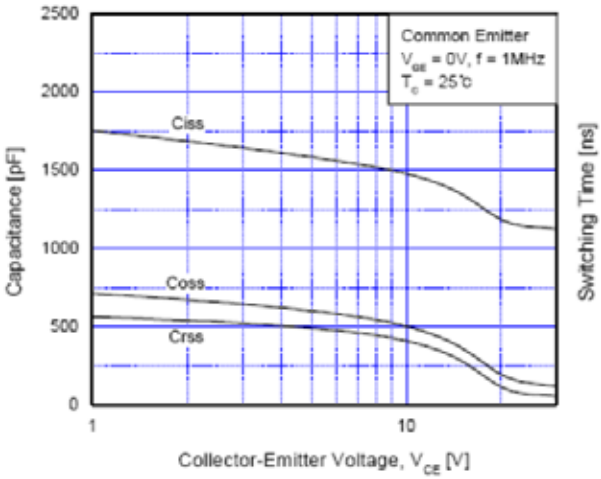
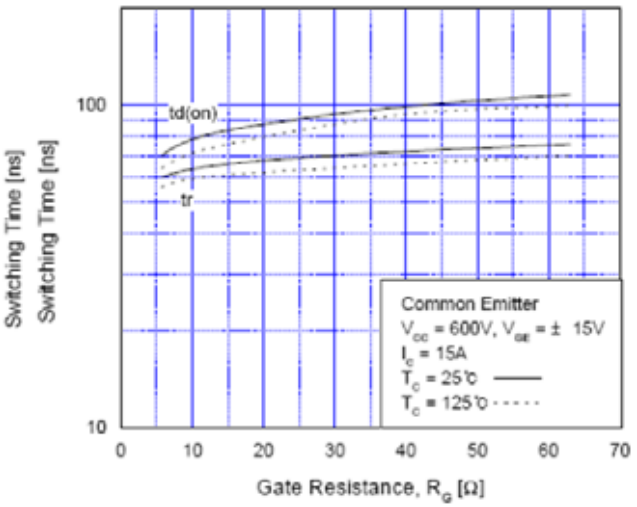
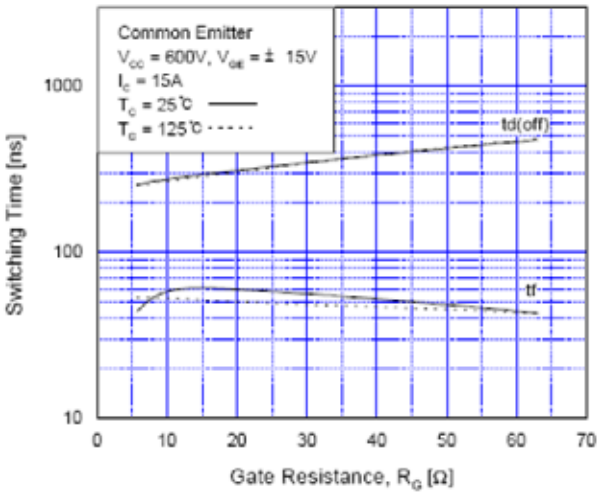


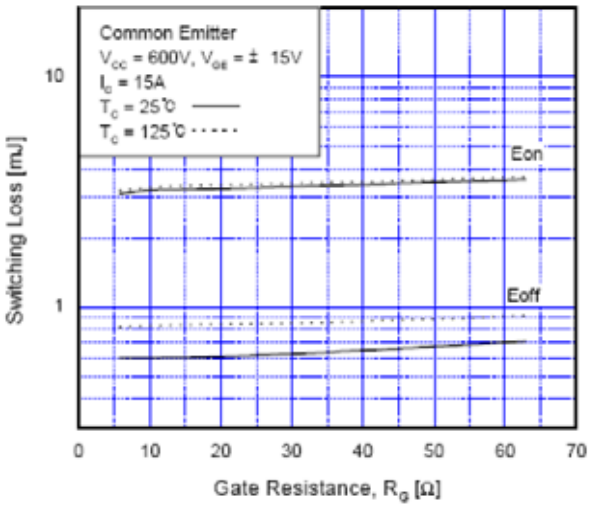
7.Capacitance Characteristics



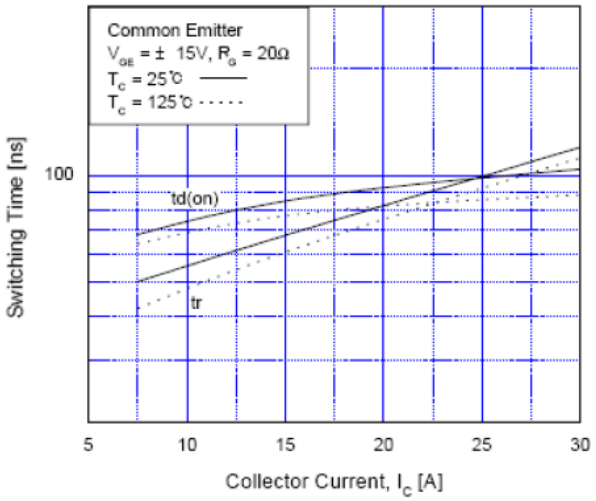
8.Turn-On Characteristics vs. Gate Resistance

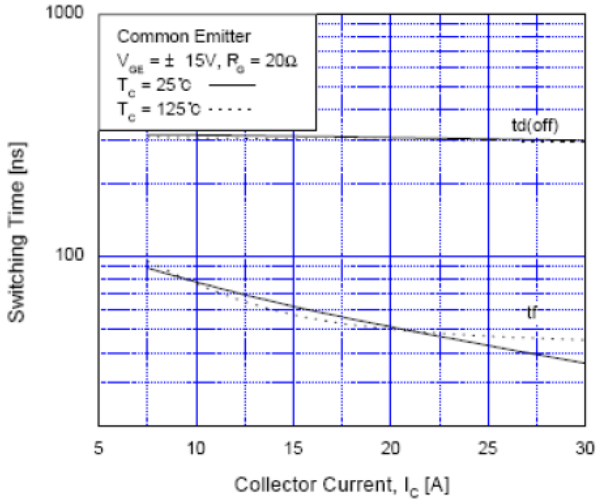


9.Turn-Off Characteristics vs.Gate Resistance



10.Switching Loss vs. Gate Resistance





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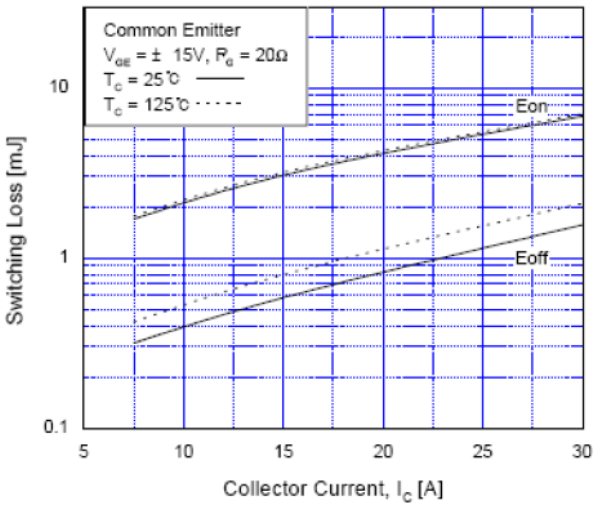
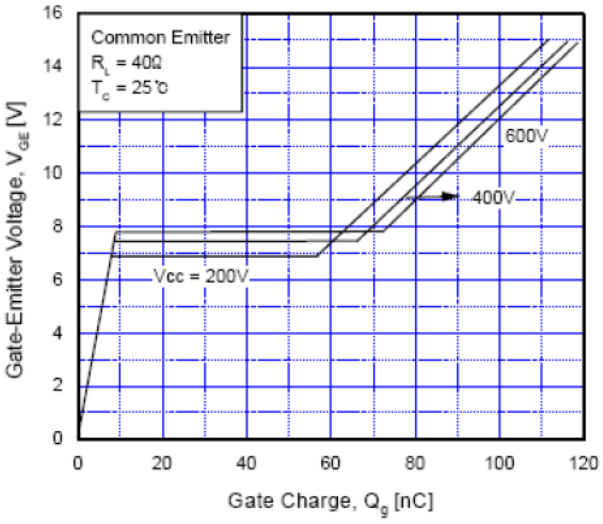
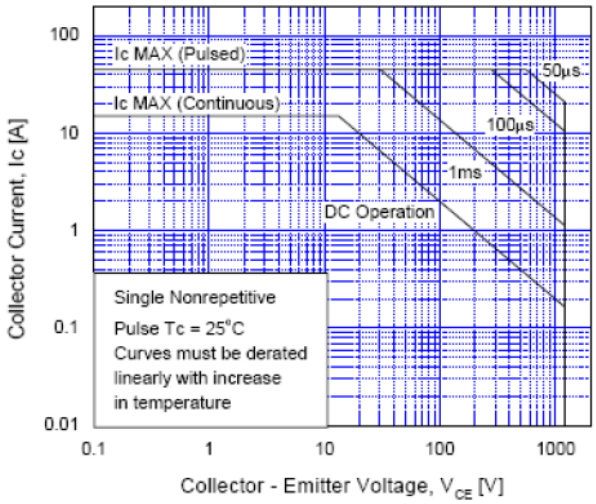


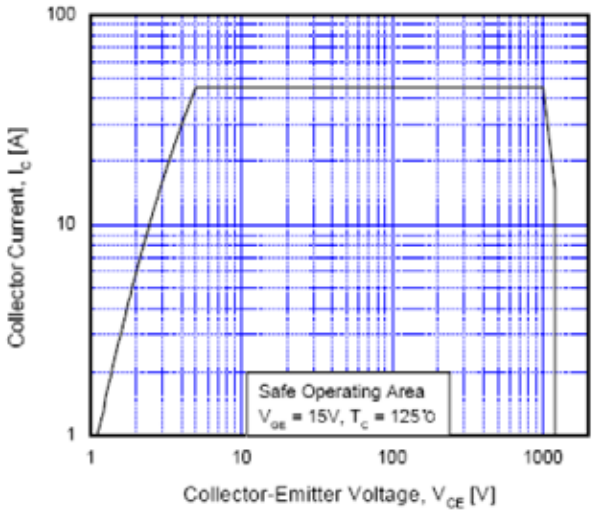
13.Switching Loss vs. Collector Current



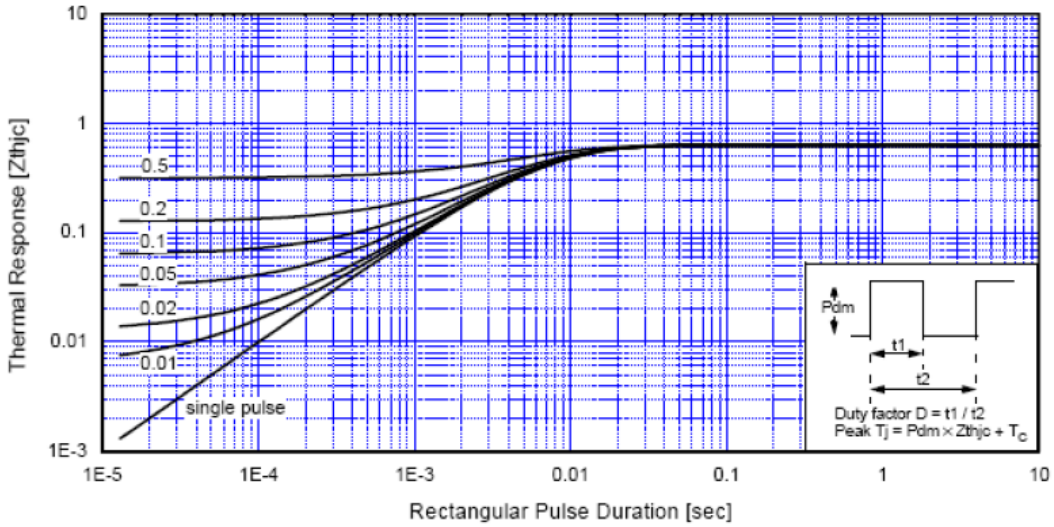
14.Gate Charge Characteristics



15.SOA Characteristics



16.Turn-Off SOA



17.Transient Thermal Impedance

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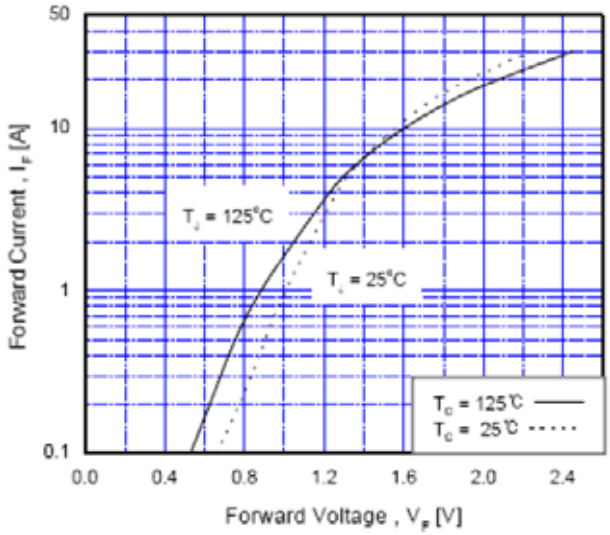
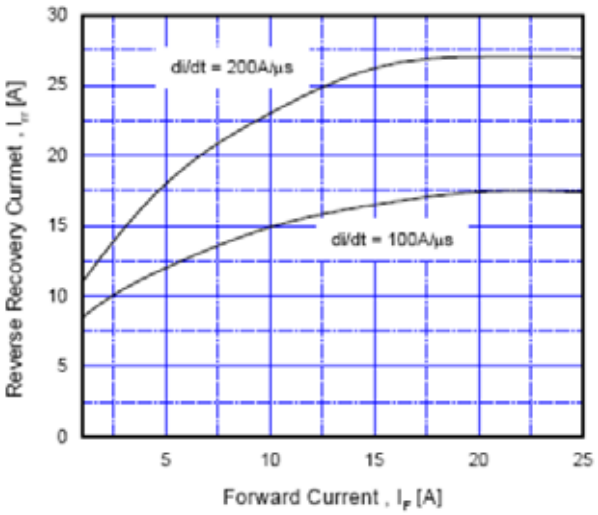
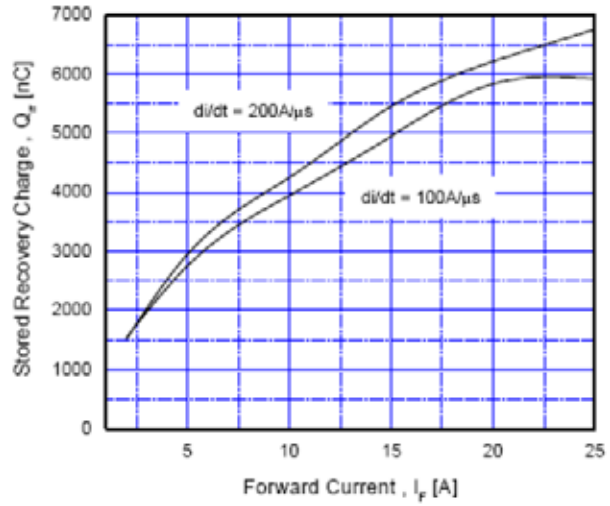


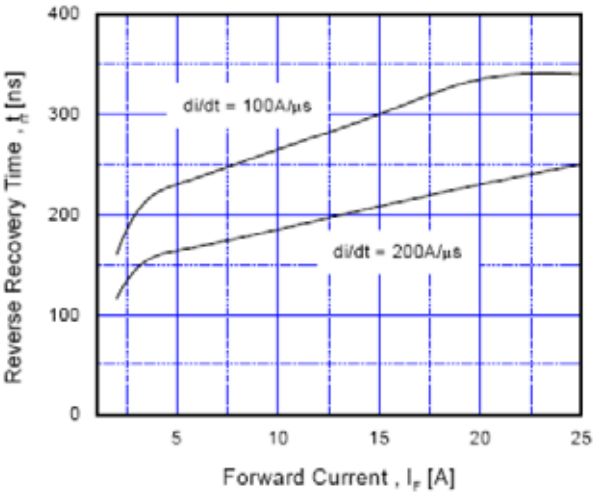
18.Forward Characteristics



19.Reverse Recovery Current



20.Stored Charge

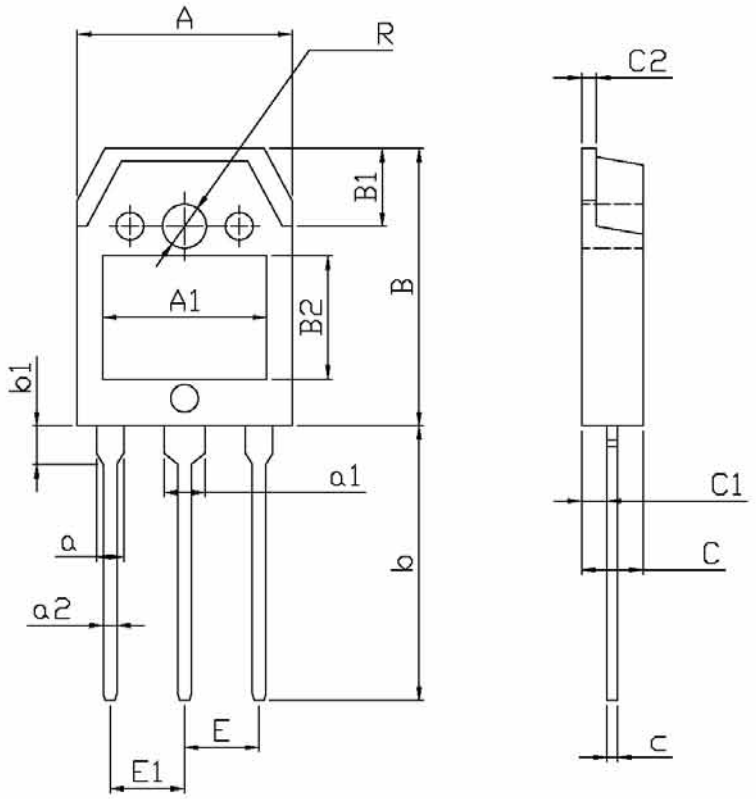


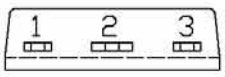
21.Reverse Recovery Time

Package Dimensions

TO-3P

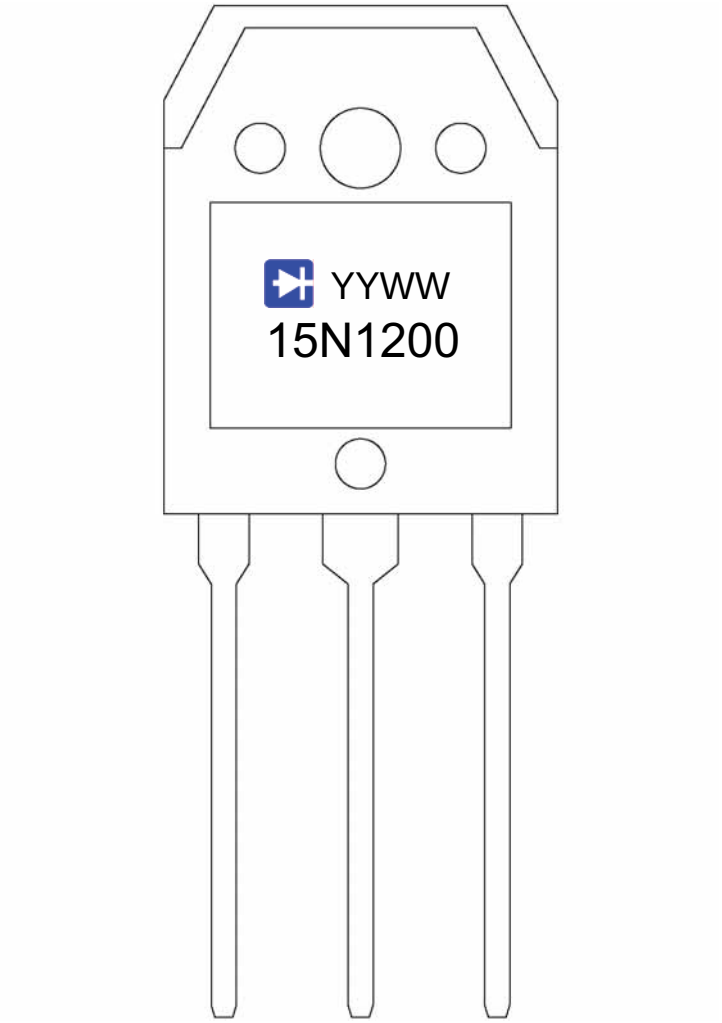
单位：mm





Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	15.4	16.0	a2	0.8	1.2
R	3.1	3.5	E	5.45	
B	19.8	20.8	E1	5.45	
B1	5.5	5.9	C	4.3	4.7
B2	9.0		C1	1.2	1.6
A1	12.0		C2	1.4	1.6
b	19.6	20.6	c	0.5	0.7
b1	3.0	3.4			
a	1.8	2.2			
a1	2.8	3.2			

Marking Instructions

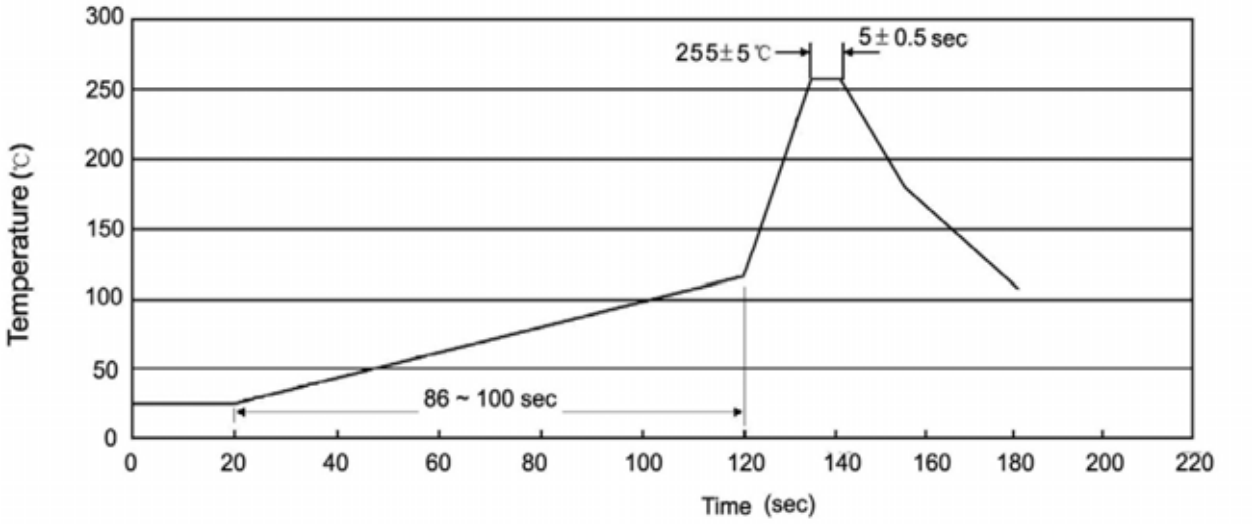


Note:

Logo+ YYWW: Date Code.

15N1200(Product Type.)

Temperature Profile for Dip Soldering(Pb-Free)



N o t e :

1.Preheating:25~150℃, Time:60~90sec.

2.PeakTemp.:255±5℃, Duration:5±0.5sec.

3.Cooling Speed: 2~10℃/sec.

Resistance to Soldering Heat Test Conditions

Temp.:270±5 ℃ Time:10±1 sec

Packaging SPEC.

T U B E

Package Type	Units					Dimension		(unit: mm^3)
	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Tube	Inner Box	Outer Box
TO-3P	30	15	450	5	2250	497.5×46×8	555×164×50	575×290×180

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