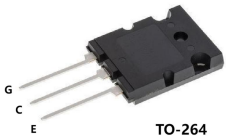
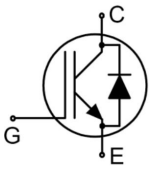
Features

- 1200V 50A, $V_{CE(sat)(typ.)}$=2.8V
- High speed switching
- Higher system efficiency
- Soft current turn-off waveforms
- Square RBSOA



Applications

- Electric Welding Machine



Absolute Ratings（Tc=25℃）

Parameter	Symbol		Value	Unit
Collector-Emitter Voltage	V_{CES}		1200	V
Collector Current-continuous	Ic	T=25℃	100	A
		T=100℃	50	A
Collector Current-pulse(note 1)	I_{CM}		200	A
Diode Continuous forward current	I_F	T=100℃	50	A
Diode Maximum Forward Current (Note 1)	I_{FM}		200	A
Gate-Emitter Voltage	V_{GES}		±30	V
Short Circuit Withstand Time	t_{SC}		10	us
Short Circuit Current	I_{SC}		350	A
Power Dissipation(Tc=25℃)	P_D	T_C=25℃	521	W
Power Dissipation(Tc=100℃)		T_C=100℃	104	W
Operating Temperature Range	T_J		-55~+150	℃
Storage Temperature Range	T_{STG}		-55~+150	℃
Maximum Lead Temperature for Soldering Purposes	T_L		260	℃

Electrical Characteristic(TC=25℃ unless otherwise noted)

Parameter	Symbol	Tests Conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emitter Voltage	BV_{CES}	I_C=250μA,V_{GE}=0V	1200	-	-	V
Zero Gate Voltage Collector Current	I_{CES}	V_{CE}=1200V,V_{GE}=0V	-	-	250	uA

Gate-body leakage current	I_{GES}	V_{CE}=0V,V_{GE}=±30V	-	-	±400	nA
On-Characteristics						
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	V_{CE}=V_{GE}, I_C=250uA	4.0	-	6.0	V
Collector-Emitter saturation Voltage	V_{CESAT}	V_{GE}=15V,I_C=40A	-	2.8	3.2	V
Dynamic Characteristics						
Input capacitance	C_{ies}	V_{CE}=20V, V_{GE}=0V, f=1.0MHz, Tc=25℃	-	3000	-	pF
Output capacitance	C_{oes}		-	390	-	pF
Reverse transfer capacitance	C_{res}		-	230	-	pF
Total Gate Charge	Q_g	V_{CE}=600V,I_C=50A, V_{GE}=15V,T_C=25°C	-	340	-	nC
Gate to emitter charge	Q_{ge}		-	27	-	
Gate to collector charge	Q_{gc}		-	210	-	
Switching Characteristics						
Turn-On delay time	$t_{d(on)}$	V_{CC}=600V,Ic=50A, R_G=10Ω,V_{GE}=15V Inductive load Tc=25℃	-	13	-	ns
Turn-On rise time	t_r		-	28	-	ns
Turn-off delay time	$t_{d(off)}$		-	162	-	ns
Turn-off Fall time	t_f		-	36	-	ns
Turn-on switching loss	E_{on}		-	2.8	-	mJ
Turn-off switching loss	E_{off}		-	1.4	-	mJ
Anti-Parallel Diode Characteristics and Maximum Ratings						
Diode Forward Voltage	V_F	V_{GE}=0V,I_F=50A.	-	2.40	-	V
Diode Reverse recovery time	t_{rr}	V_R=600V,I_F=40A dI_F/dt=500A/us T_J=25℃	-	136	-	ns
Reverse recovery charge	Q_{rr}		-	1.5	-	μC
Diode Reverse recovery Current	I_{rrm}		-	11	-	A

Thermal Characteristics

Symbol	Parameter	Max	Units
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case for IGBT	0.24	℃/W
$R_{th\ j\text{-}c}$	Thermal Resistance, Junction to case for Diode	0.74	℃/W
$R_{th\ j\text{-}a}$	Thermal Resistance, Junction to Ambient	25	℃/W

Notes:

1：. Repetitive Rating: Pulse width limited by maximum junction temperature

Electrical Characteristics(curves)

Fig 1. DC Collector current as a function of case temperature (VGE≥15V , Tj≤150℃)

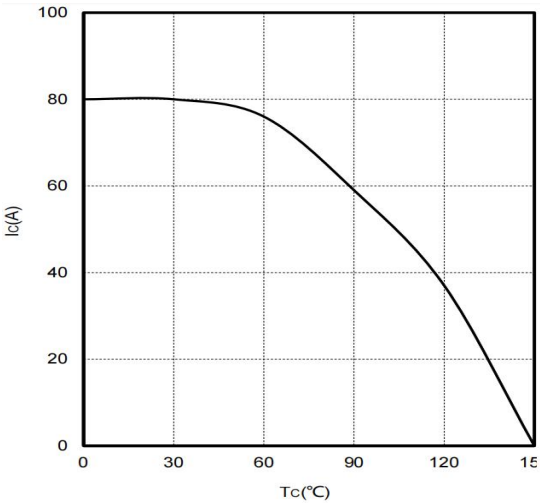


Fig 2. Power dissipation as a function of case temperature (Tj≤150℃)

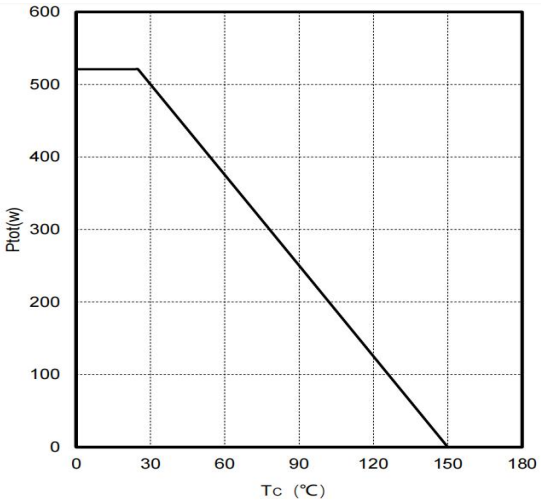


Fig 3. IGBT Forward safe operation area

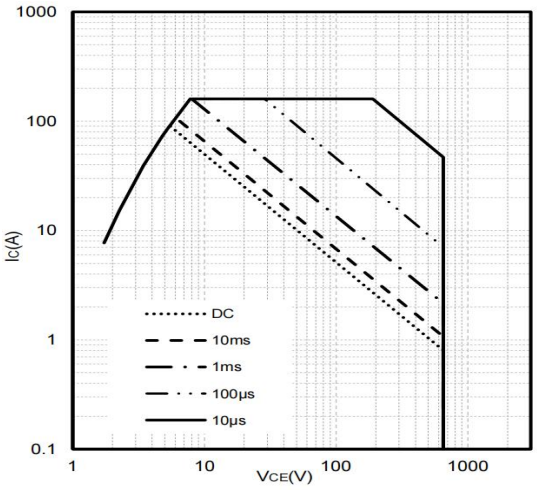


Fig 4. IGBT Reverse safe operation area

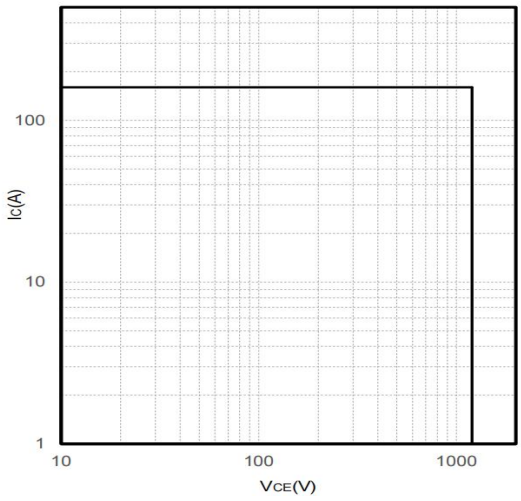


Fig 5. Typical output characteristic (Tj=25℃)

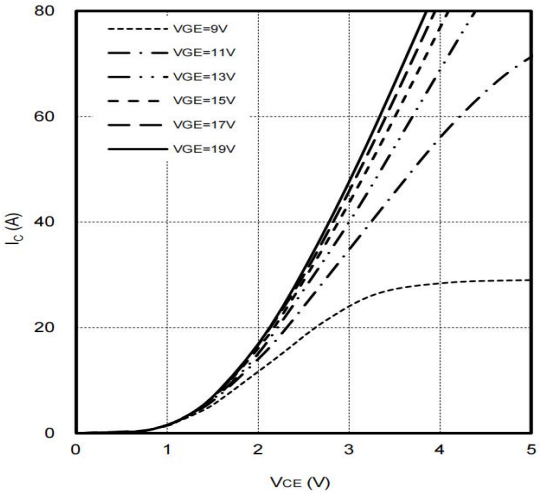


Fig 6. Typical output characteristic (Tj=125℃)

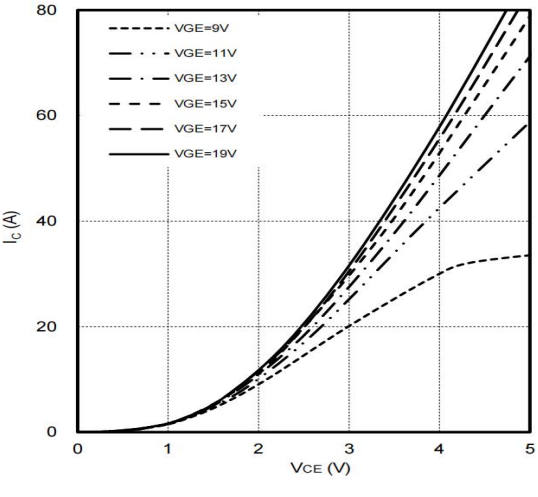


Fig 7. Transfer characteristic IGBT, IC=f(VGE),VCE=20V

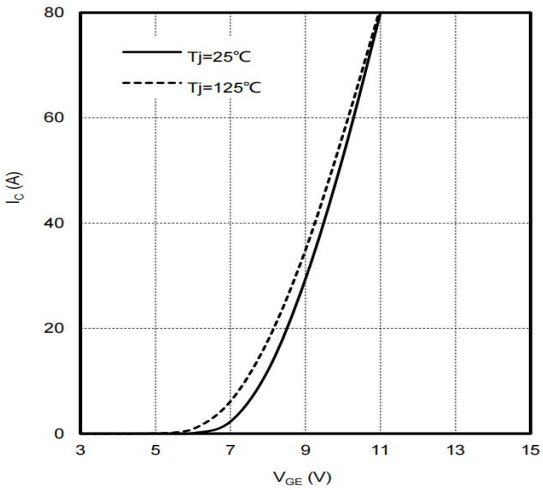


Fig 8. Typical collector-emitter saturation voltage as a function of junction temperature, IGBT VCEsat = f(Tvj) ,VGE = 15 V

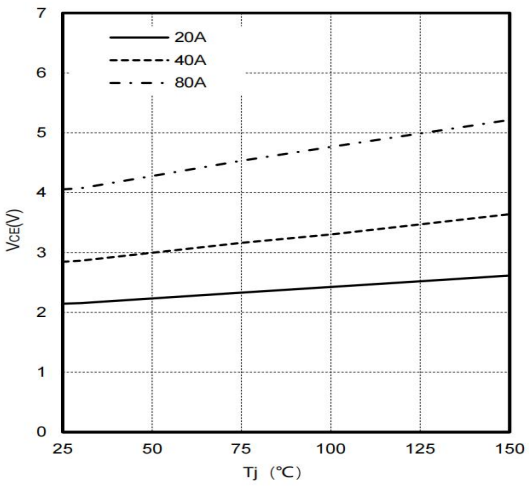
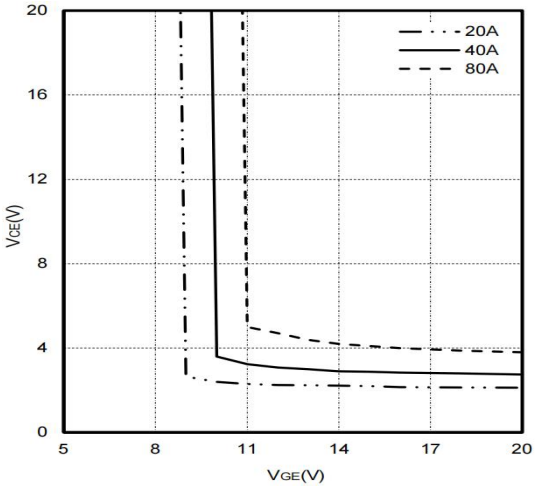


Fig 9. Typical collector-emitter saturation voltage as a function of VGE (Tj=25°C)

Fig 10. Typical collector-emitter saturation voltage as a function of VGE (Tj=125°C)



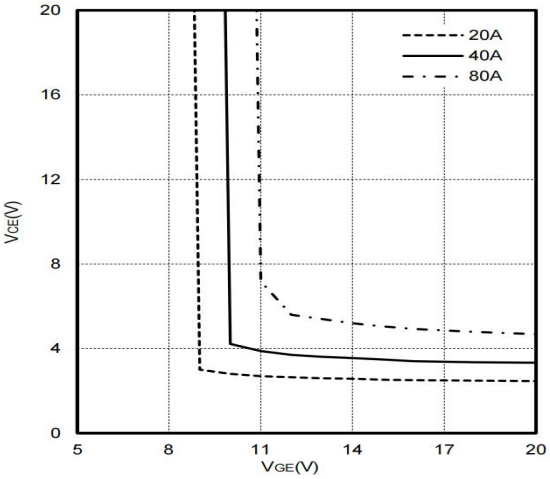
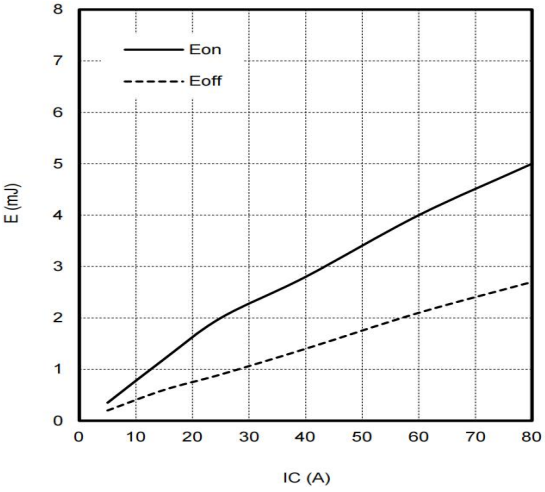


Fig 11. Typical switch energy as a function of Ic (Inductive load,Tj =25°C,Vce =600V,Vge =15V,Rg =5Ω)

Fig 12. Typical switch time as a function of Ic (Inductive load,Tj =25°C,Vce =600V,Vge =15V,Rg =5Ω)



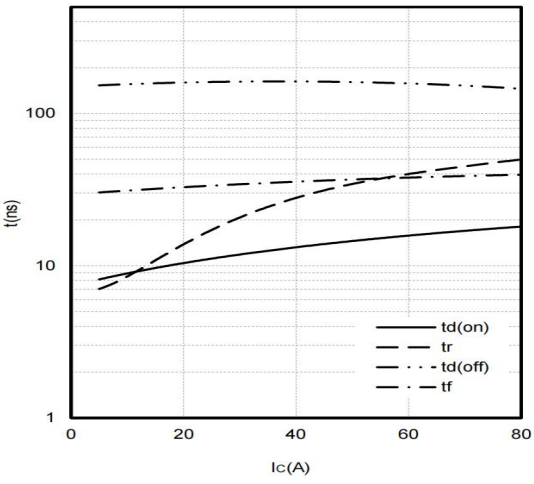


Fig 13. Typical switch energy as a function of Rg
(inductive load,Tj=25℃,Vce=600V,Vge =15V,Ic=40A)

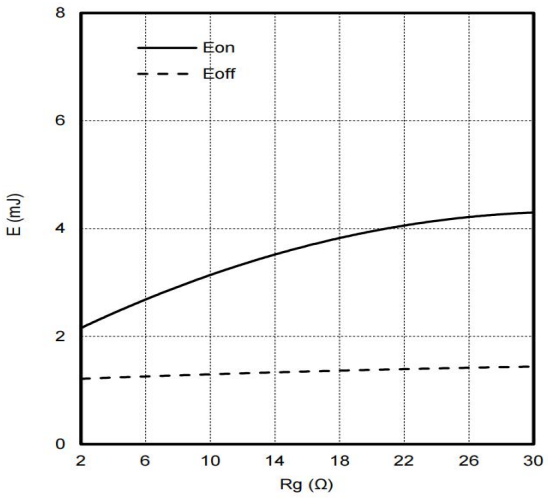


Fig 14. Typical switch time as a function of Rg
(inductive load,Tj =25℃,Vce =600V,Vge =15V,Ic=40A)

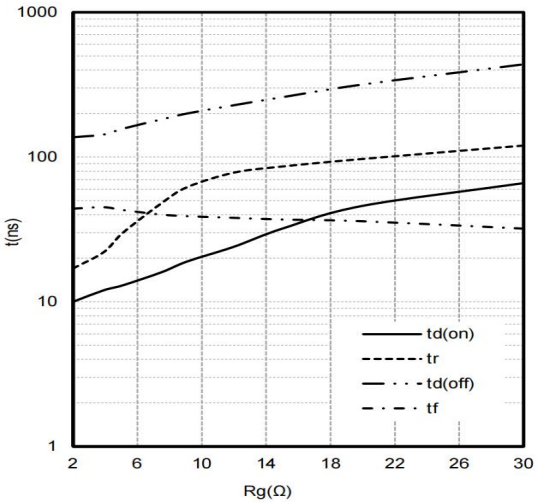


Fig 15. Typical capacitance as a function of
collector-emitter voltage (Vge =0V,f=1MHz)

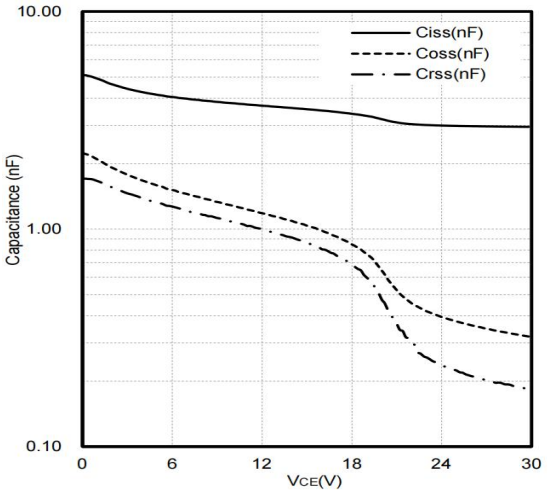


Fig 16. Typical gate charge (Ic=40A)

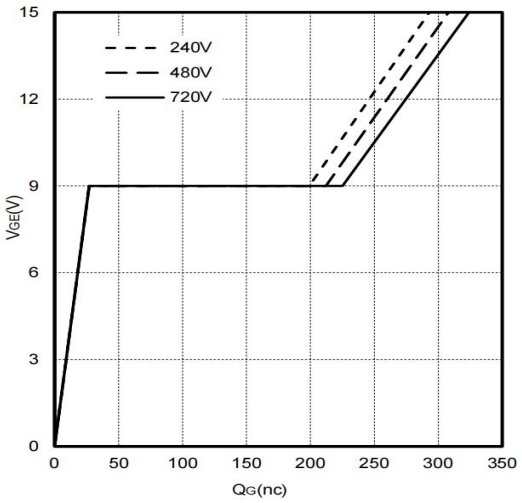


Fig 17. Typical diode forward current as a function
of forward voltage

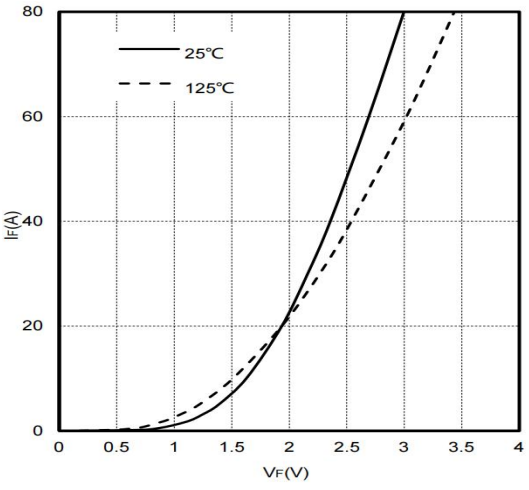


Fig 18. Typical trr as a function of dif/dt,Vr=600V,
If=40A,Tj =25℃

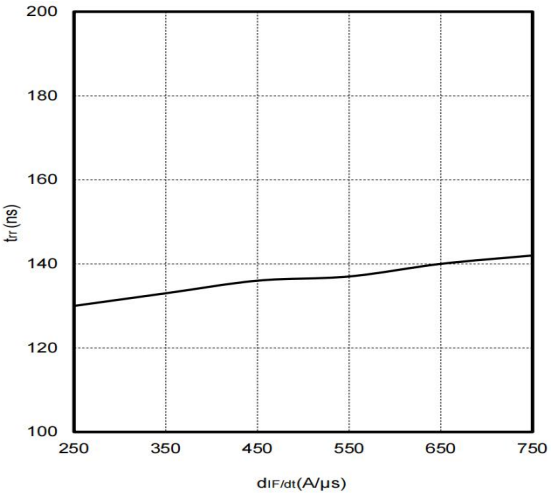


Fig 19. Typical Irrm as a function of dif/dt, Vr=600V, If=40A,Tj =25°C

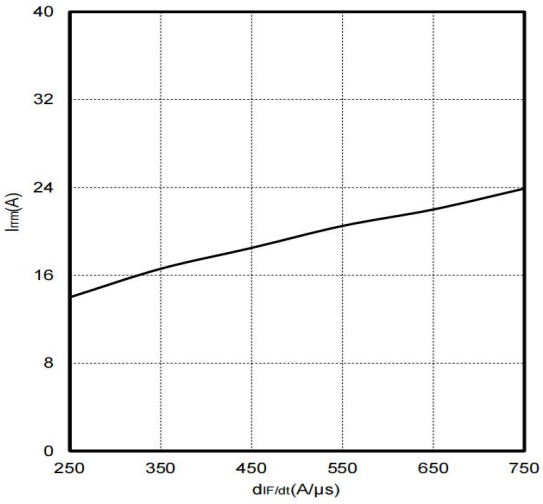


Fig 20. Typical Qrr as a function of dif/dt, Vr=600V, If=40A,Tj =25°C

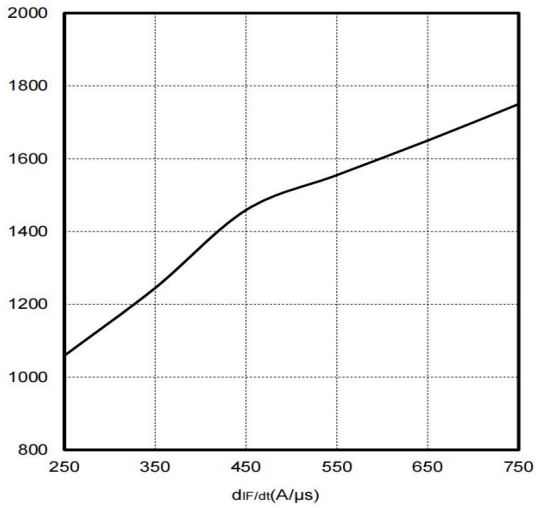
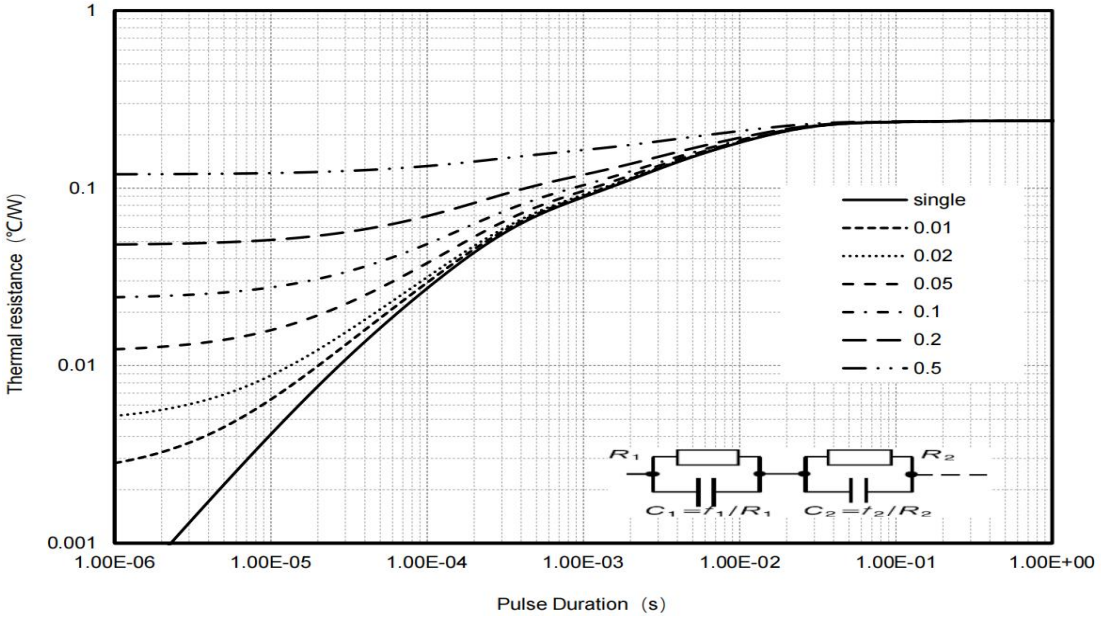
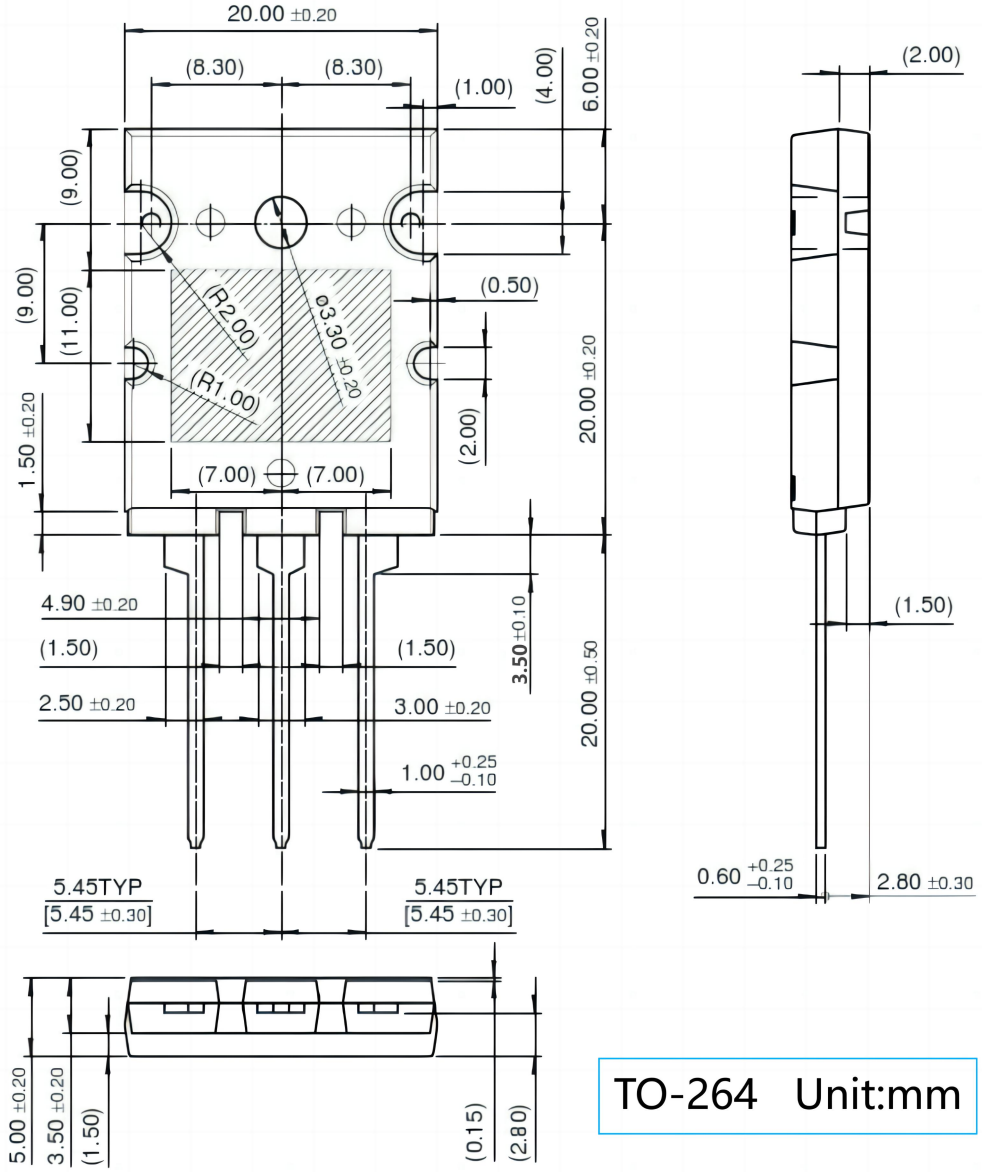


Fig 21. IGBT transient thermal impedance, Zth=f(tp),D=tp/T



Package Mechanical DATA



TO-264 Unit:mm