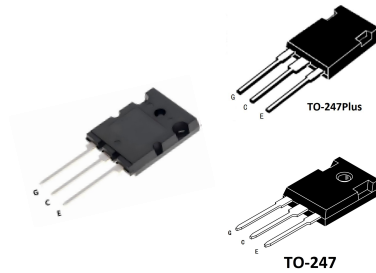


Features

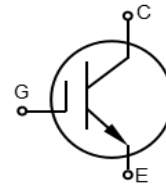
- High Blocking Voltage
- International Standard Package
- Low Conduction Losses
- High Current Handling Capability
- MOS Gate Turn-On, Drive Simplicity

M IGBT



Applications

- Switch-Mode and Resonant-Mode Power Supplies
- UPS
- Capacitor Discharge Circuits
- Laser Generators



Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Collector-Emitter voltage		V_{CES}	3000	V
Gate-emitter voltage(Continuous)		V_{GES}	± 20	
Gate-emitter voltage(Transient)		V_{GEM}	± 30	
Collector current	$T_C=25^\circ\text{C}$	I_C	130	A
	$T_C=110^\circ\text{C}$		55	
Pulsed collector current($T_C=25^\circ\text{C}$, 1ms)		I_{CM}	600	
Power dissipation (TO-264, TO-247Plus)	$T_C=25^\circ\text{C}$	P_D	625	W
	$T_C=100^\circ\text{C}$		208	
Power dissipation (TO-247)	$T_C=25^\circ\text{C}$	P_D	312	W
	$T_C=100^\circ\text{C}$		125	
Operating Junction and storage temperature rang		T_J	-55 to 150	$^\circ\text{C}$
		T_{stg}	-55 to 150	
Maximum Lead Temperature for Soldering Purposes		T_L	300	$^\circ\text{C}$

Electrical Characteristics ($T_C=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition		Min	Typ	Max	Unit
Static Characteristics							
Collector-emitter breakdown voltage	BV_{CES}	$I_C=250\mu A, V_{GE}=0V$		3000	-	-	V
Gate-emitter threshold voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_C=250\mu A$		4.0	4.8	5.6	
Zero gate voltage collector	I_{CES}	$V_{CE}=V_{CES},$	$T_J=25^{\circ}C$	-	-	50	μA

current		V _{GE} = 0V	T _J =125°C	-	-	3	mA
Gate-emitter leakage current	I _{GES}	V _{GE} = ±20V, V _{CE} = 0V		-	-	±200	nA
Collector-emitter saturation voltage,Note 1	V _{CE(sat)}	I _C = 20A,V _{GE} = 15V T _C = 25°C		-	5.3	7.7	V
		I _C = 55A, V _{GE} = 15V, T _C = 125°C		-	7.6	-	
Dynamic and Switching Characteristics							
Transconductance	g _{fs}	I _C =55A,V _{CE} =10V,Note 1		32	50		S
Input capacitance	C _{ies}	V _{CE} =25V, V _{GE} =0V, f=1.0MHz		-	7300	-	pF
Reverse transfer capacitance	C _{oes}			-	275	-	
Output capacitance	C _{res}			-	83	-	
Total gate charge	Q _g	V _{CE} =1000V, I _C = 55A, V _{GE} = 15V		-	335	-	nC
Gate to emitter Charge	Q _{ge}			-	47	-	
Gate to collector Charge	Q _{gc}			-	130	-	
Turn-on delay time	t _{d(on)}	V _{GE} = 15V, V _{CC} = 1500V, I _C = 55A, R _G = 2Ω, Inductive Load, T _C = 25°C		-	54	-	ns
Rise time	t _r			-	307	-	
Turn-off delay time	t _{d(off)}			-	230	-	
Fall time	t _f			-	268	-	
Turn-on delay time	t _{d(on)}	V _{GE} = 15V, V _{CC} = 1500V, I _C = 55A, R _G = 2Ω, Inductive Load, T _C =125°C		-	52	-	ns
Rise time	t _r			-	585	-	
Turn-off delay time	t _{d(off)}			-	215	-	
Fall time	t _f			-	260	-	

Notes:

1: Pulse Test, $t_s 300\mu s$, Duty Cycle, $d \leq 2\%$

Additional provisions for lead-to-lead isolation are required at $V_{CE} > 1200V$

Thermal Characteristics

Parameter	Symbol	Value		Unit
		TO-264/TO-247Plus	TO-247	
Thermal resistance junction-to-ambient	$R_{\theta JA}$	42.5	62.5	$^{\circ}C/W$
Thermal resistance junction-to-case for IGBT	$R_{\theta JC}$	0.24	0.40	

Order Message

Order Codes	Package
MSG55T300HLB3	TO-264
MSG55T300HLC1	TO-247Plus
MSG55T300HLC0	TO-247

Typical Performance Characteristics

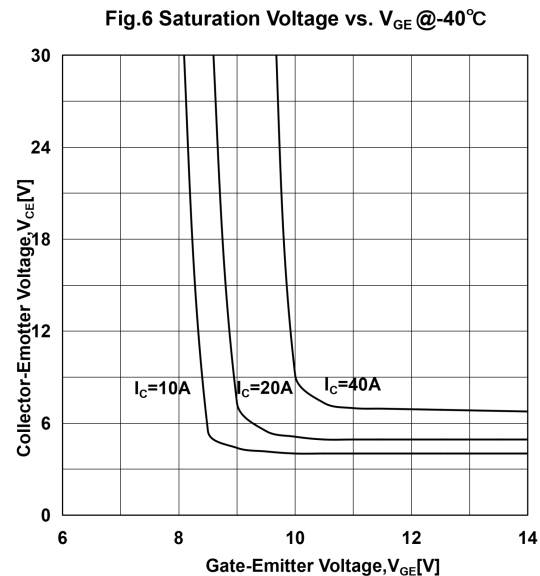
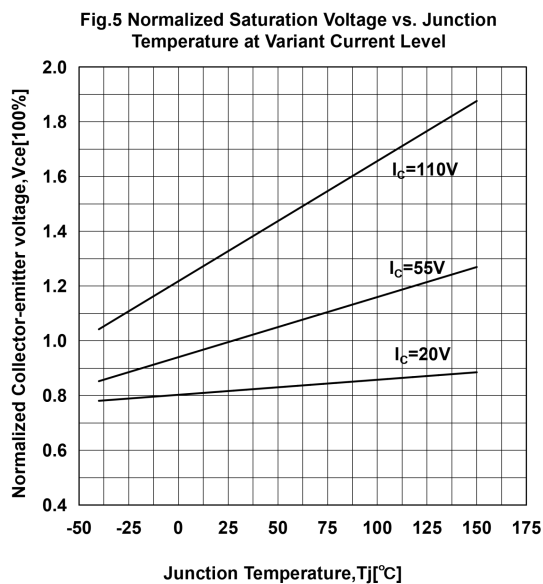
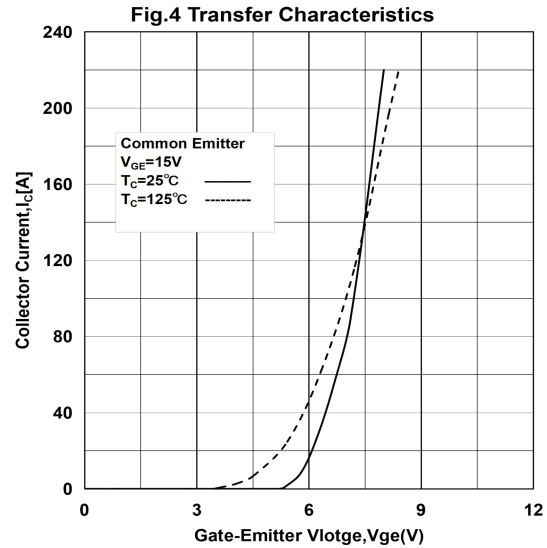
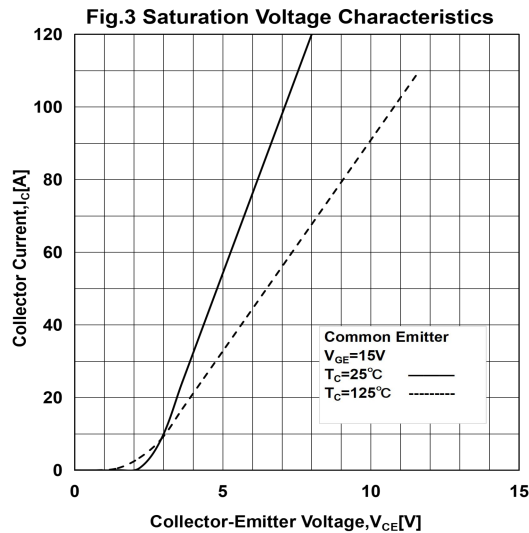
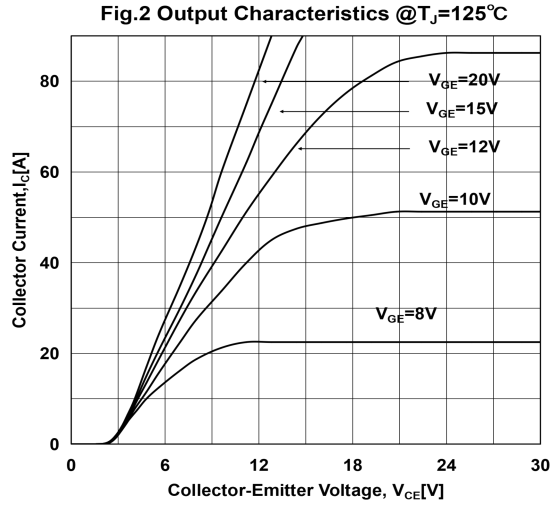
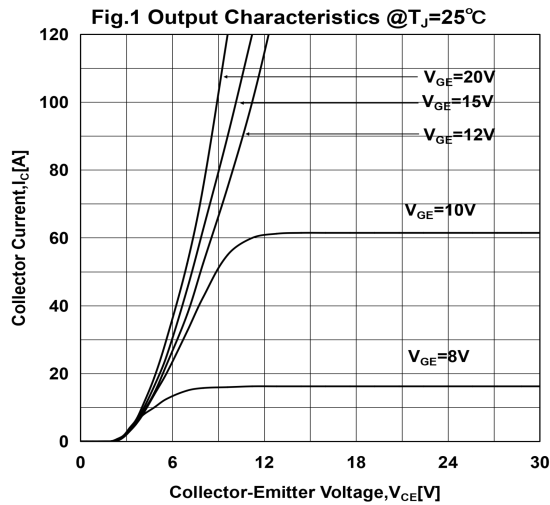


Fig.7 Saturation Voltage vs. V_{GE} @25°C

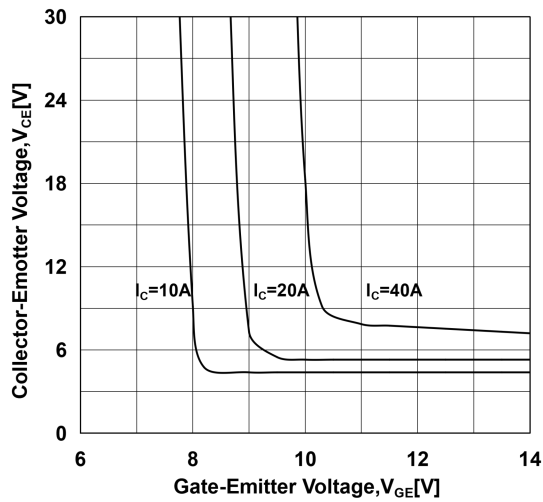


Fig.8 Saturation Voltage vs. V_{GE} @125°C

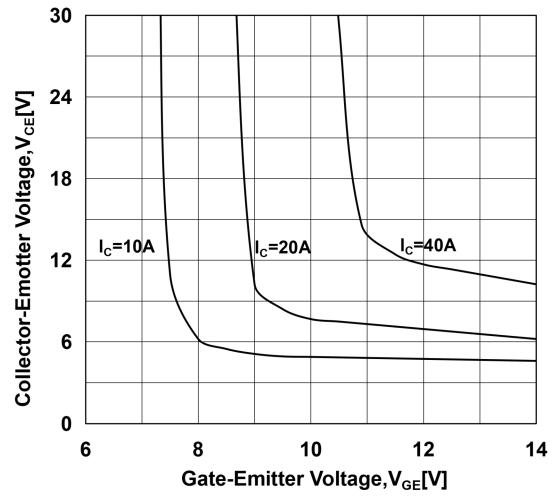


Fig.9 Capacitance Characteristics

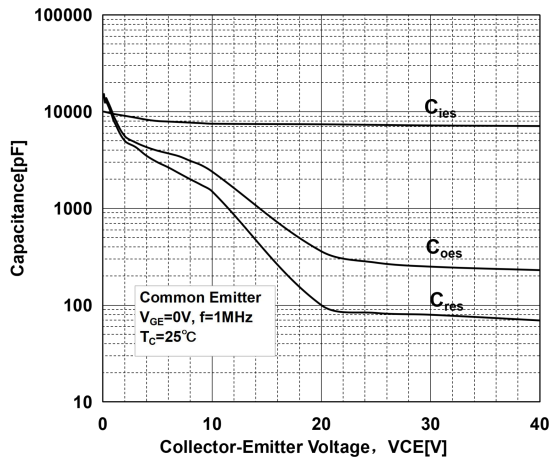


Fig.10 Gate Charge Characteristics

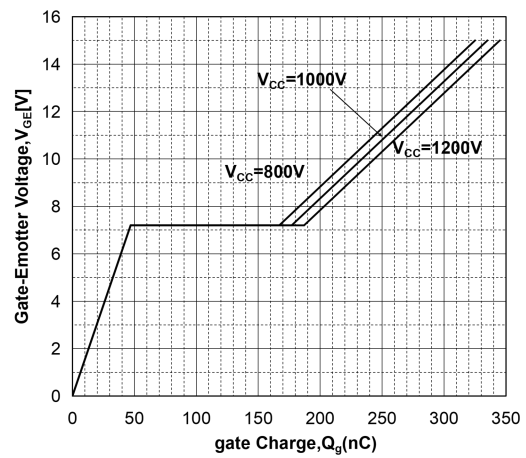


Fig.11 Transconductance

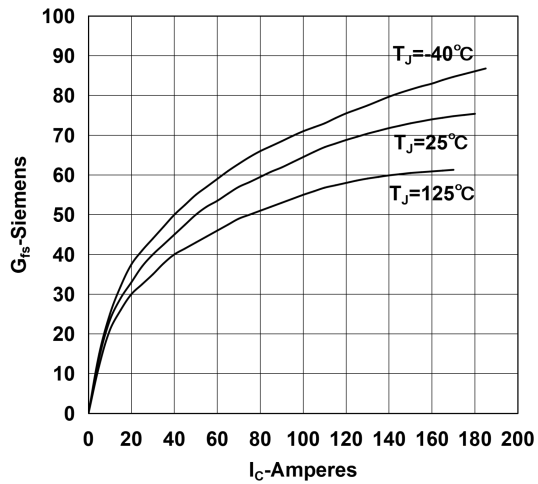


Fig. 12 Collector to Emitter Breakdown Voltage vs. Junction Temperature

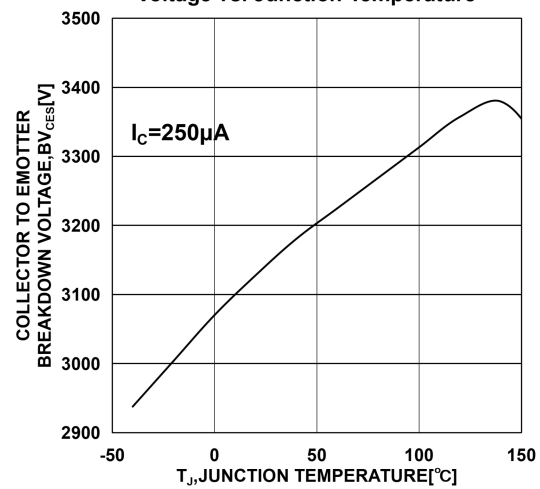


Fig.13 Switching Time vs. T_j
 $V_{ge}=15V, V_{CE}=1500V, I_C=55A, R_g=2\Omega$

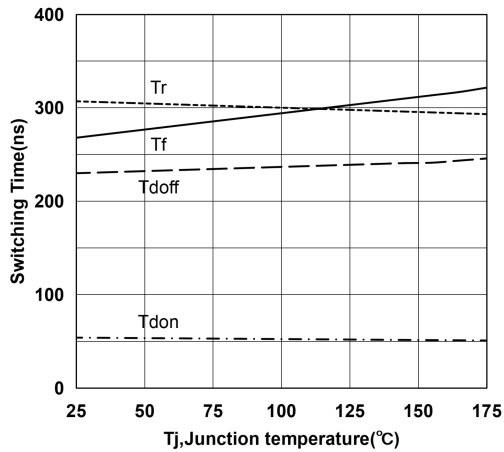


Fig.14 Switching Time Vs. $R_g(125^\circ C)$
 $V_{ge}=15V, V_{CE}=1500V, I_C=55A$

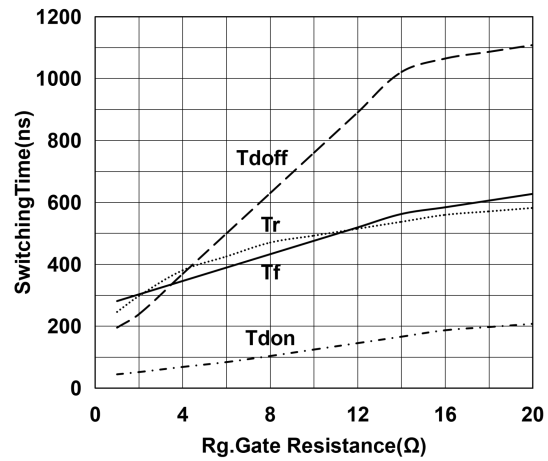


Fig.15 Switching Time vs. $I_C(125^\circ C)$
 $V_{ce}=1500V, V_{ge}=15V, R_g=2\Omega$

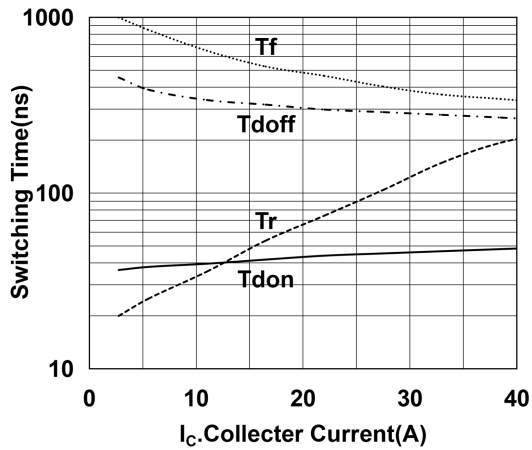


Fig. 16 Switching Loss vs. T_j
 $V_{ge}=15V, V_{ce}=1500V, I_C=55A, R_g=2\Omega$

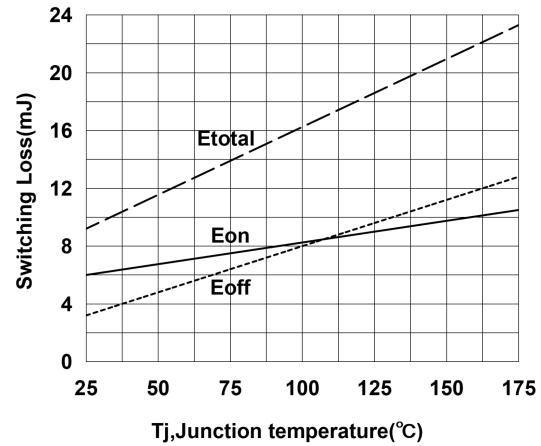


Fig.17 Switching Loss vs. R_g
 $V_{ge}=15V, V_{ce}=1500V, I_C=55A$

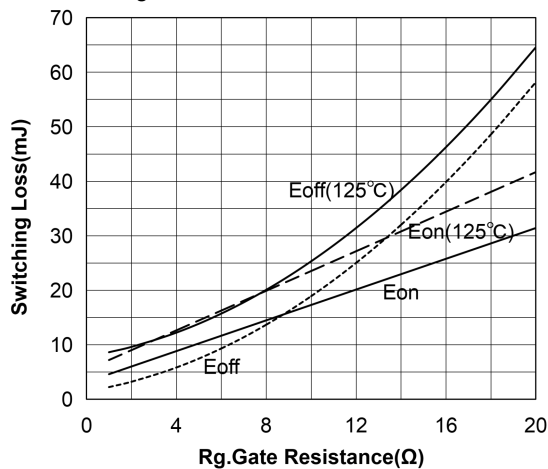


Fig.18 Switching Loss vs. I_C
 $V_{ge}=15V, V_{ce}=1500V, R_g=2\Omega$

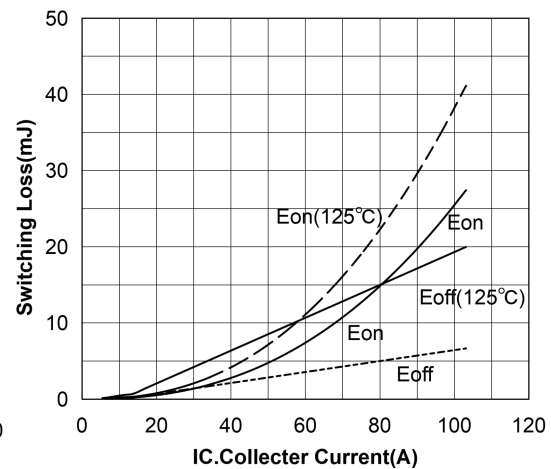


Fig.19 Foward Bias Safe Operating Area
For TO-264/TO-247Plus

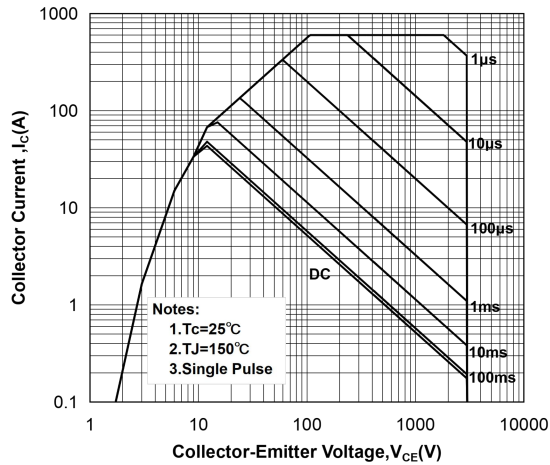


Fig.20 Foward Bias Safe Operating Area
For TO-247

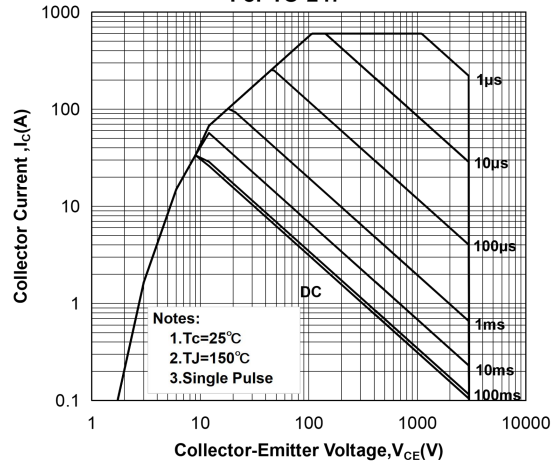


Fig. 27 Transient Thermal Impedance for TO-247Plus/TO-264

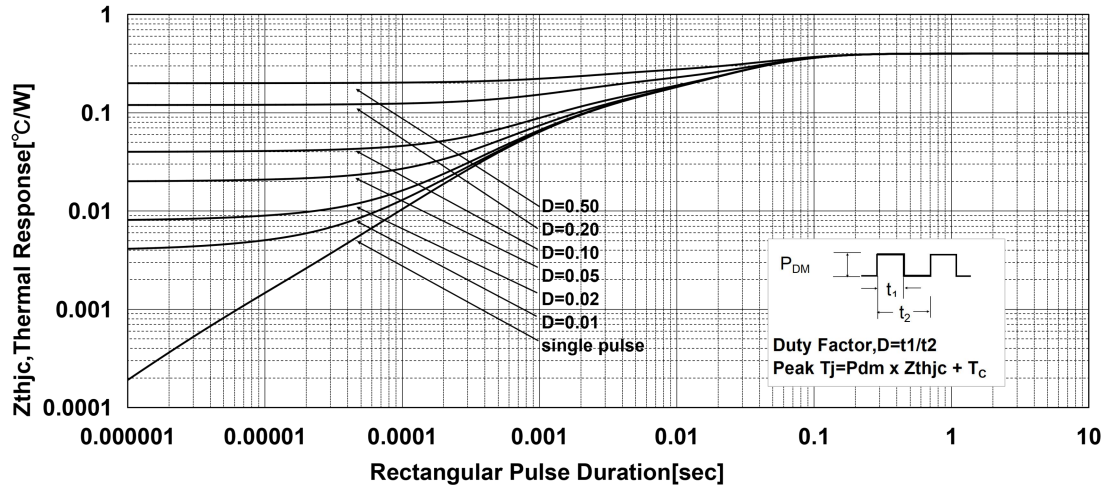
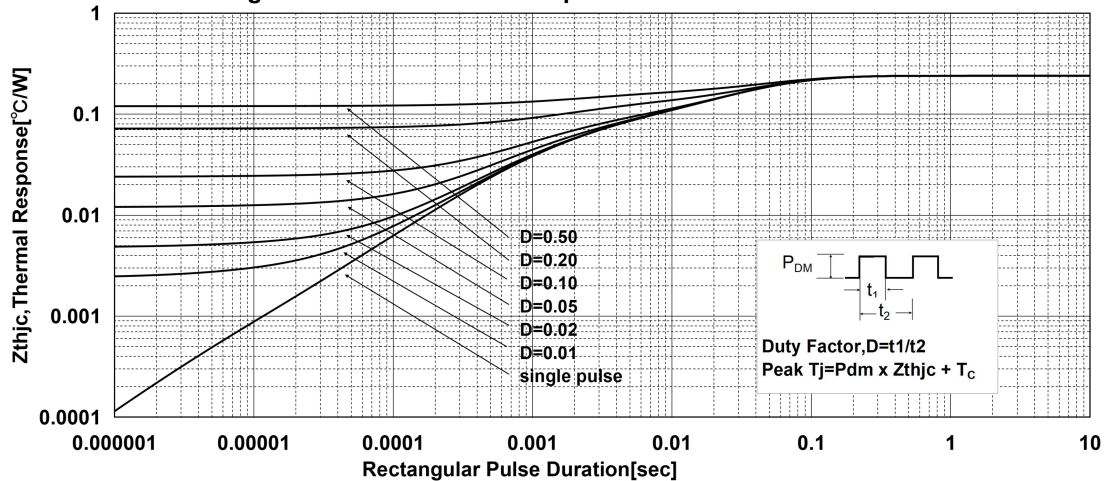
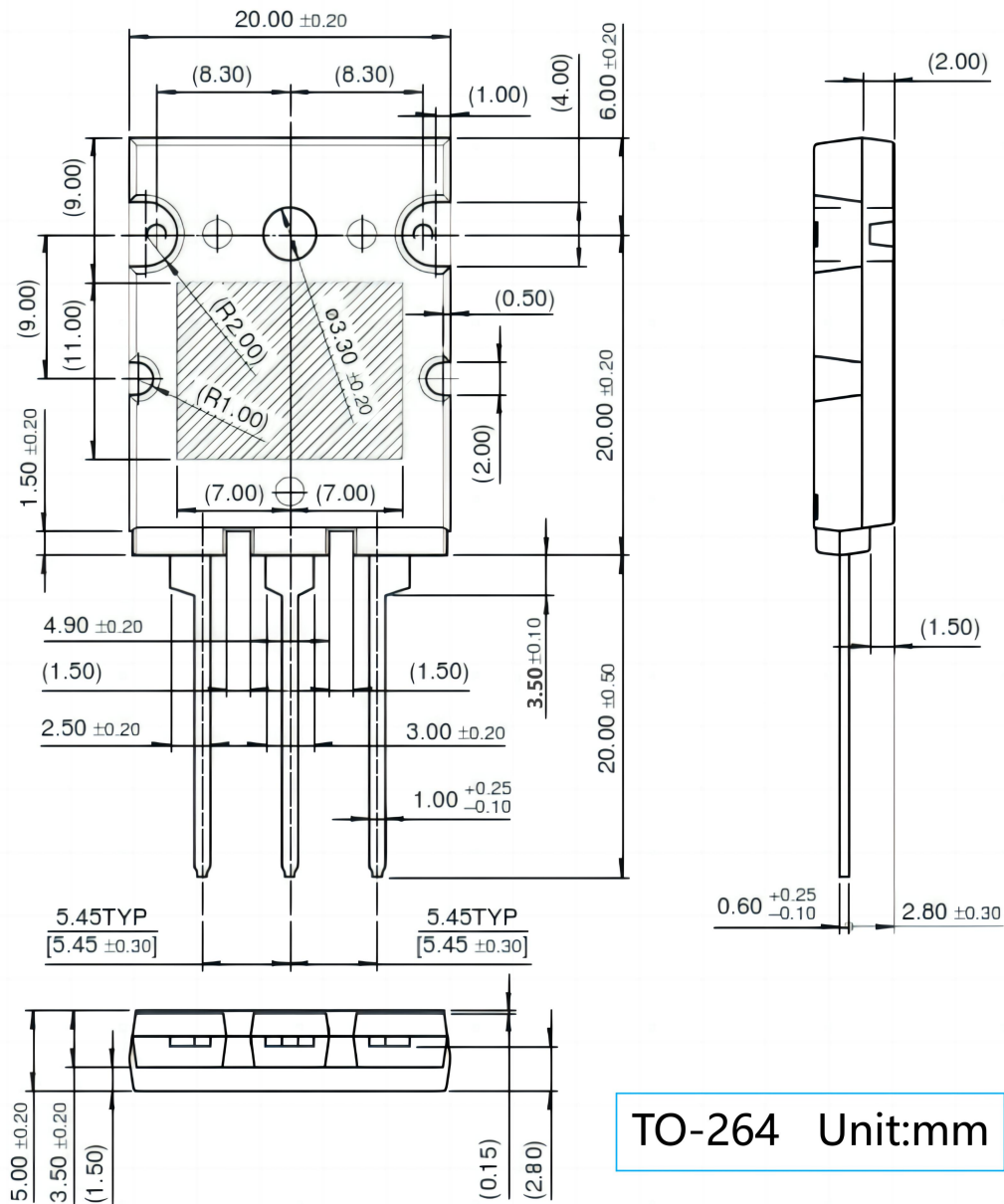


Fig. 21 Transient Thermal Impedance for TO-247



Package outline dimension



TO-264 Unit:mm

