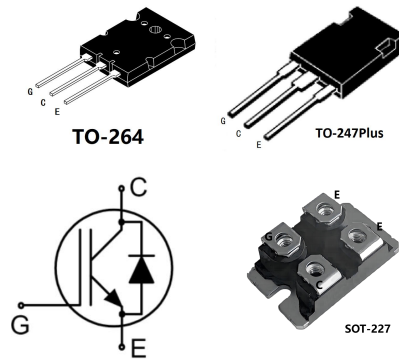


Features

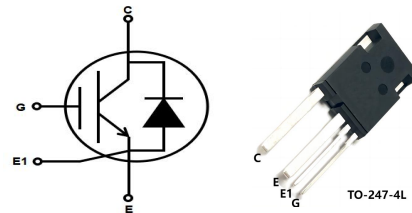
- Very Low Saturation Voltage:
 $V_{CE(sat)} = 1.65V @ I_C = 100A$
- Maximum Junction Temperature: $T_J = 175^{\circ}C$
- Positive Temperature Co-Efficient
- Tight Parameter Distribution
- High Input Impedance



Applications

- Traction Inverter for HEV/EV
- Auxiliary DC/AC Converter
- Motor Drives
- Other Power-Train Applications
Requiring High Power Switch

MSG100T65HLB3/C1/F4



MSG100T65HLC6

Absolute Ratings($T_c=25^{\circ}C$)

Parameter	Symbol	Value	Unit
Collector-Emitter Voltage	V_{ce}	650	V
Collector Current-continuous	I_C $T=25^{\circ}C$ $T=100^{\circ}C$	200	A
		100	A
Diode forward current	I_F $T=25^{\circ}C$ $T_c=100^{\circ}C$	150	A
		75	A
Collector Current-pulse (note 1)	I_{CM}	300	A
Gate-Emitter Voltage	V_{GES}	± 20	V
Power Dissipation (TO-264, TO-247Plus, TO-247-4L)	PD	750	W
Power Dissipation(SOT-227)	PD	1000	
Operating and Storage Temperature Range	T_J, T_{STG}	$-55 \sim +150$	$^{\circ}C$
Short Circuit Withstand Time	t_{sc}	5	μs
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^{\circ}C$
Isolation Voltage for Case-Terminal	V_{ISO}	3.0	KV

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Off-Characteristics						
Collector-Emitter Voltage	BV_{CES}	$I_c=1.6\text{mA}, V_{GE}=0\text{V}$	650	-	-	V
Zero Gate Voltage Collector Current	I_{CES}	$V_{CE}=650\text{V}, V_{GE}=0\text{V},$	-	-	2	μA
Gate-body leakage current, forward	I_{GESF}	$V_{CE}=0\text{V}, V_{GE}=20\text{V}$	-	-	100	nA
Gate-body leakage current, reverse	I_{GESR}	$V_{CE}=0\text{V}, V_{GE}=-20\text{V}$	-	-	-100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}, I_c=0.6\text{mA}$	3.5	5.0	6.5	V
Collector-Emitter saturation Voltage	V_{CESAT}	$V_{GE}=15\text{V}, I_c=100\text{A}$	-	-	1.65	V
Dynamic Characteristics						
Input capacitance	C_{ies}	$V_{CE}=30\text{V},$ $V_{GE}=0\text{V},$ $f=1.0\text{MHZ}$	-	5012	-	pF
Output capacitance	C_{oes}		-	430	-	pF
Reverse transfer capacitance	C_{res}		-	100	-	pF

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

Parameter	Symbol	Tests conditions	Min	Typ	Max	Units
Switching Characteristics						
Turn-on delay time	$t_{d(on)}$	$V_{CC}=400\text{V}, I_c=100\text{A},$ $R_G=4.7\Omega, V_{GE}=15\text{V},$ Inductive Load $T_c=25^{\circ}\text{C}$	-	84	-	ns
Turn-On rise time	t_r		-	147	-	ns
Turn-Off delay time	$t_{d(off)}$		-	216	-	ns
Turn-Off Fall time	t_f		-	133	-	ns
Turn-on Loss	E_{on}		-	5.4	-	mJ
Turn-off Loss	E_{off}		-	3.8	-	mJ
Total Loss	E_{ts}		-	9.2	-	mJ
Turn-on delay time	$t_{d(on)}$	$V_{CC}=400\text{V}, I_c=100\text{A},$ $R_G=4.7\Omega, V_{GE}=15\text{V},$ Inductive Load $T_c=175^{\circ}\text{C}$	-	80	-	ns
Turn-On rise time	t_r		-	160	-	ns
Turn-Off delay time	$t_{d(off)}$		-	244	-	ns
Turn-Off Fall time	t_f		-	166	-	ns

Turn-on switching Loss	E _{on}		-	9.7	-	mJ
Turn-off switching Loss	E _{off}		-	5.2	-	mJ
Total switching Loss	E _{ts}		-	14.9	-	mJ
Gate Charge	Q _g	V _{CC} =400V,I _c =100A V _{GE} =15V	-	157	-	nC
Gate to Emitter Charge	Q _{ge}		-	43	-	nC
Gate to Collector Charge	Q _{gc}		-	64	-	nC
Anti-Parallel Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Voltage	V _F	I _F =75A(T _J =25℃)	-	1.6	-	V
Diode Reverse recovery time	t _{rr}	I _F =75A dI _F =/dt=200A/us T _J =25℃	-	62	-	ns
Diode Reverse recovery charge	Q _{rr}		-	164	-	nC

Thermal Characteristic

Parameter	Symbol	Max				Unit
		TO-264	TO-247Plus	TO-247-4L	SOT-227	
Thermal Resistance, Junction to Case (IGBT)	$R_{th(j-c)}$	0.2			0.145	$^{\circ}C/W$
Thermal Resistance, Junction to Case (Diode)	$R_{th(j-c)}$	0.3			0.25	$^{\circ}C/W$
Thermal Resistance, Junction to Ambient	$R_{th(j-A)}$	25			10	$^{\circ}C/W$

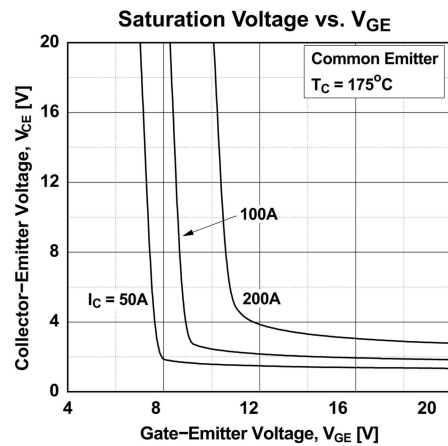
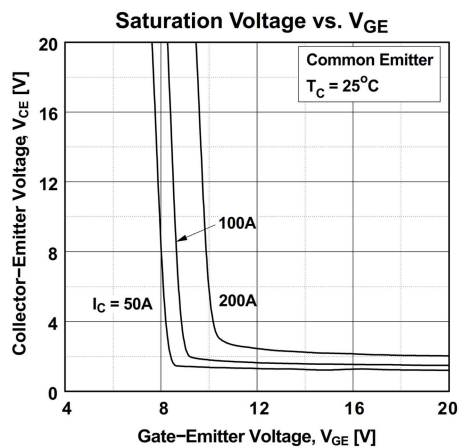
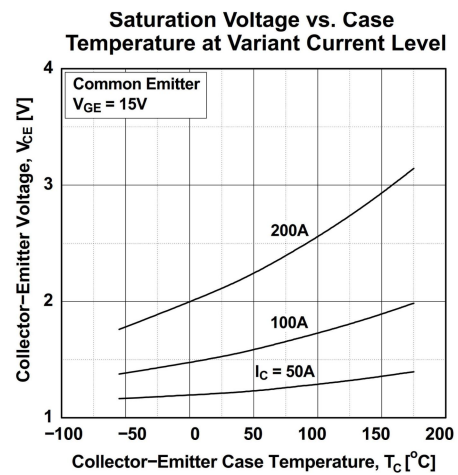
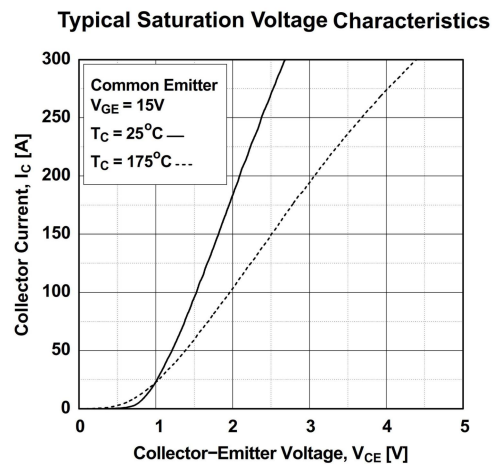
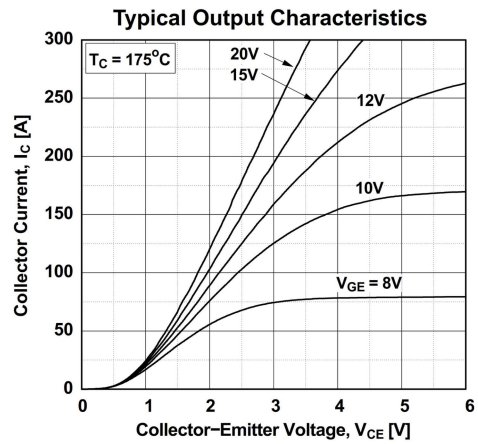
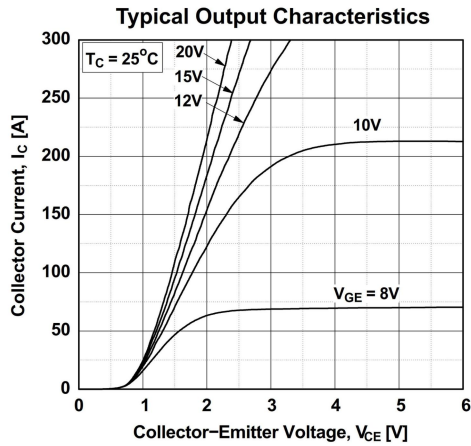
Note:

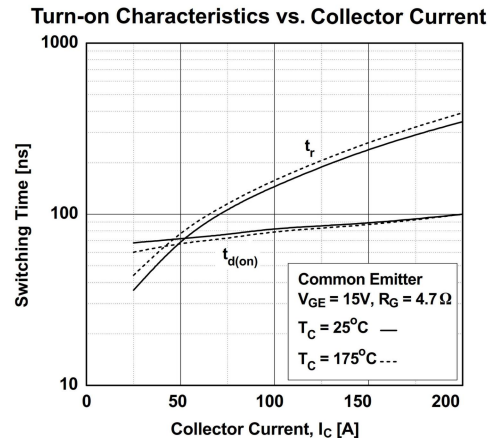
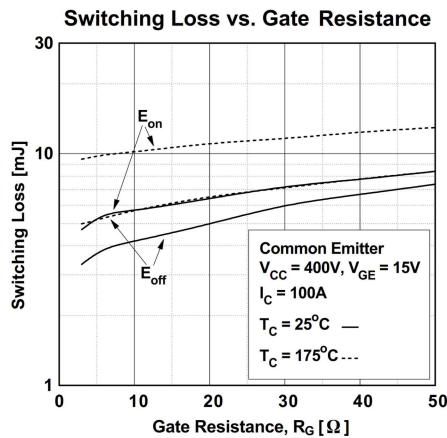
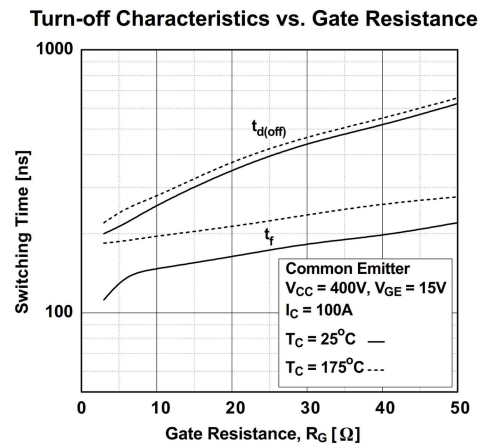
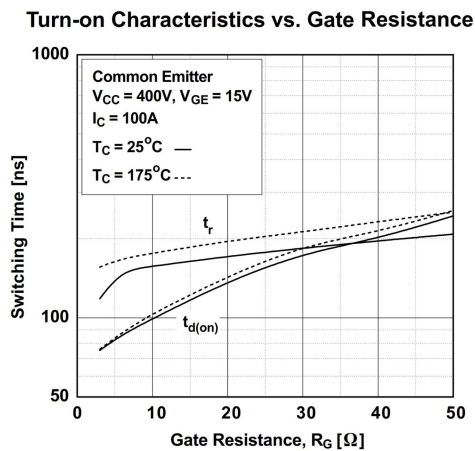
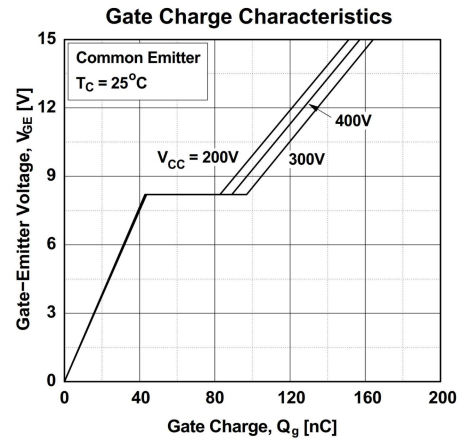
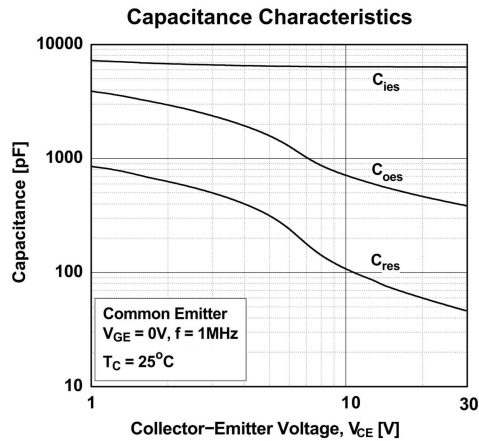
1. Repetitive Rating: Pulse width limited by maximum junction temperature

Order Information

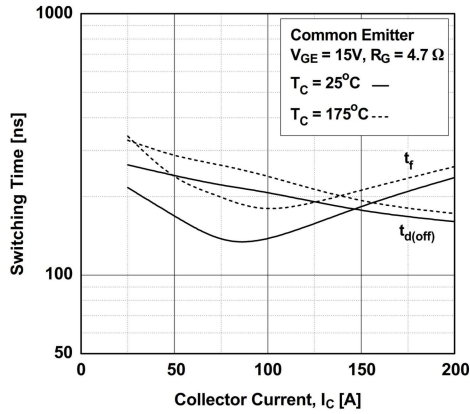
type specification	packaging
MSG100T65HLB3	TO-264
MSG100T65HLC1	TO-247Plus
MSG100T65HLF4	SOT-227
MSG100T65HLC6	TO-247-4L

Electrical Characteristics (curves)

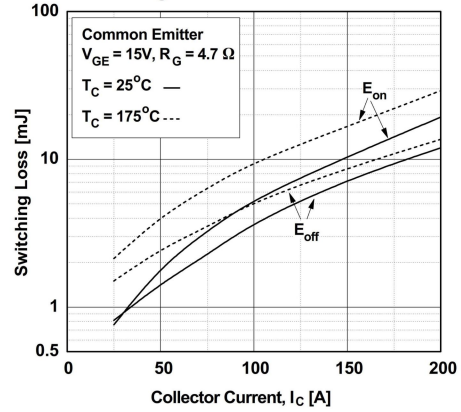




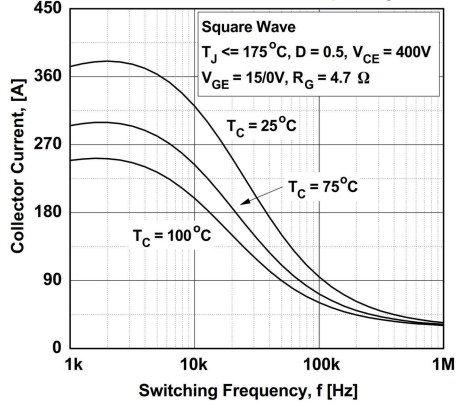
Turn-off Characteristics vs. Collector Current



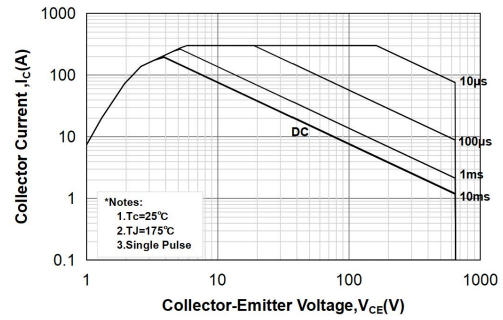
Switching Loss vs. Collector Current



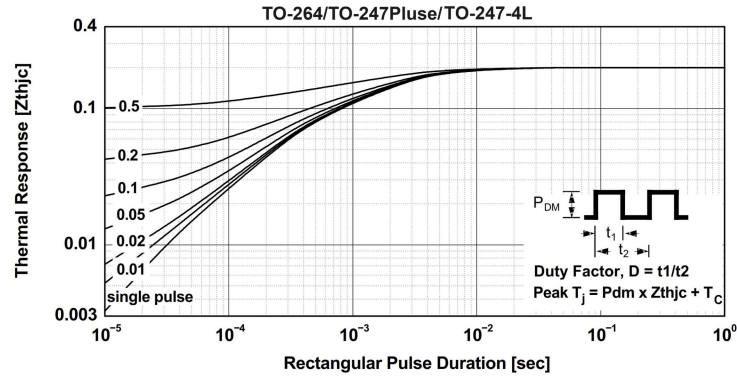
Load Current vs. Frequency



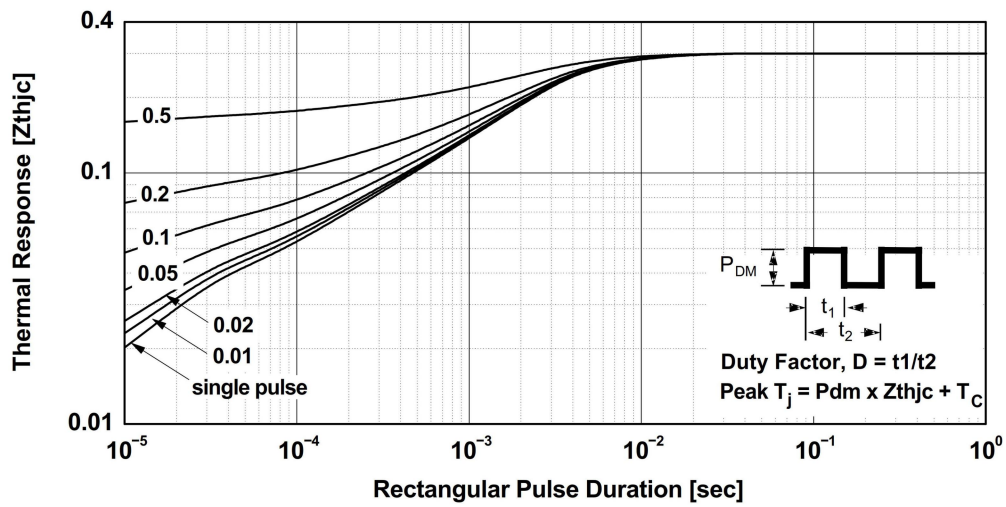
Forward Bias Safe Operating Area For TO-264/TO-247Plus/TO-247-4L



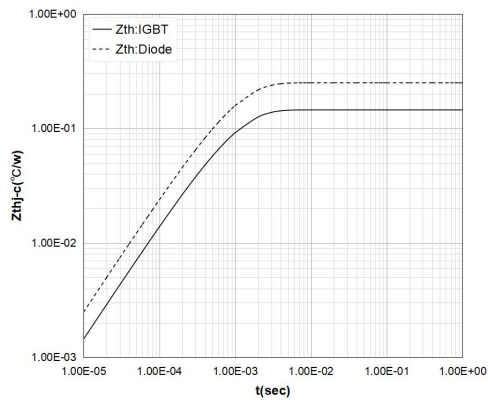
Transient Thermal Impedance of IGBT



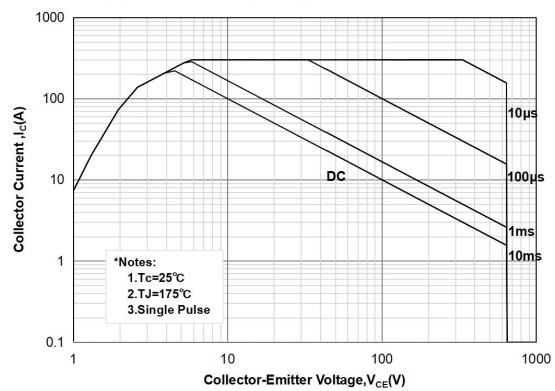
Transient Thermal Impedance of Diode



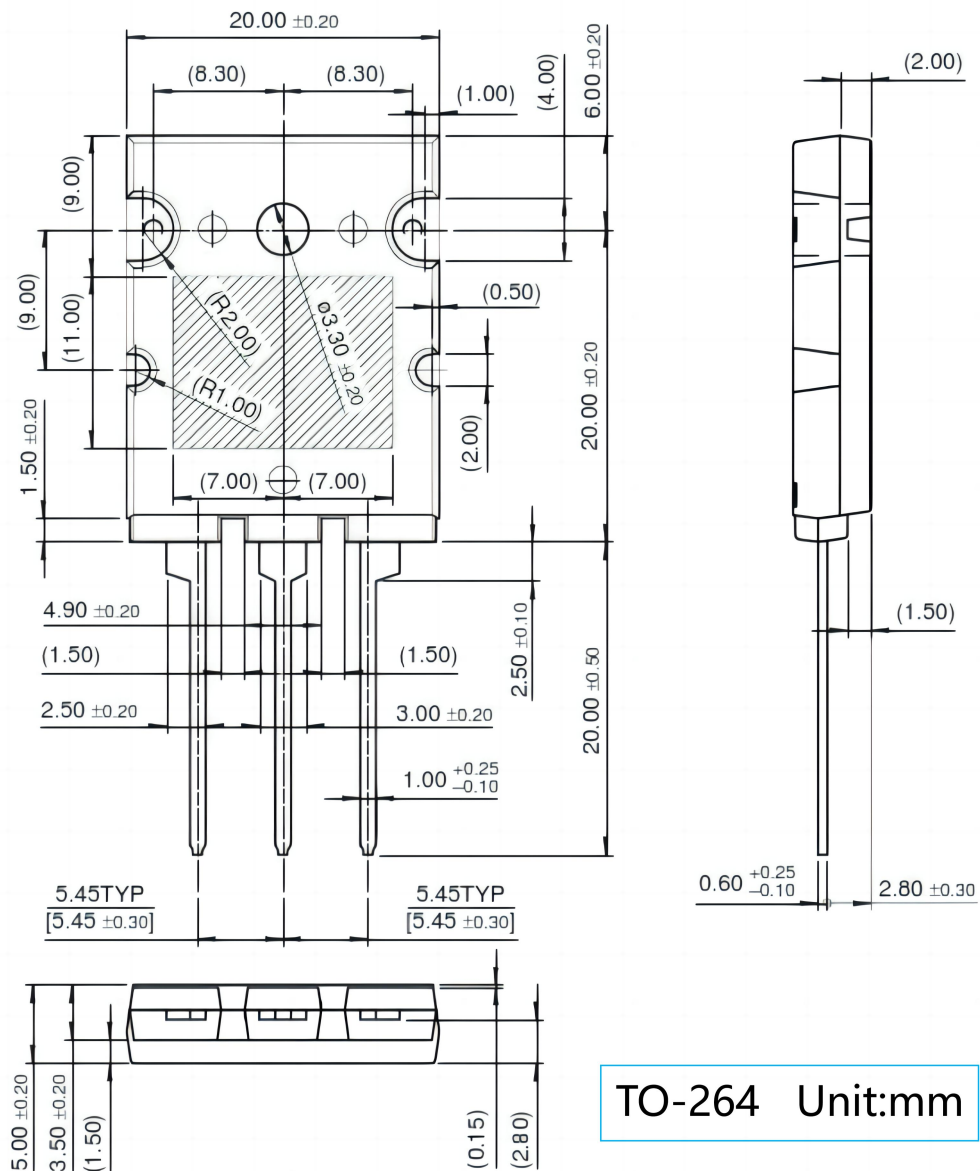
Transient Thermal Impedance for SOT-227



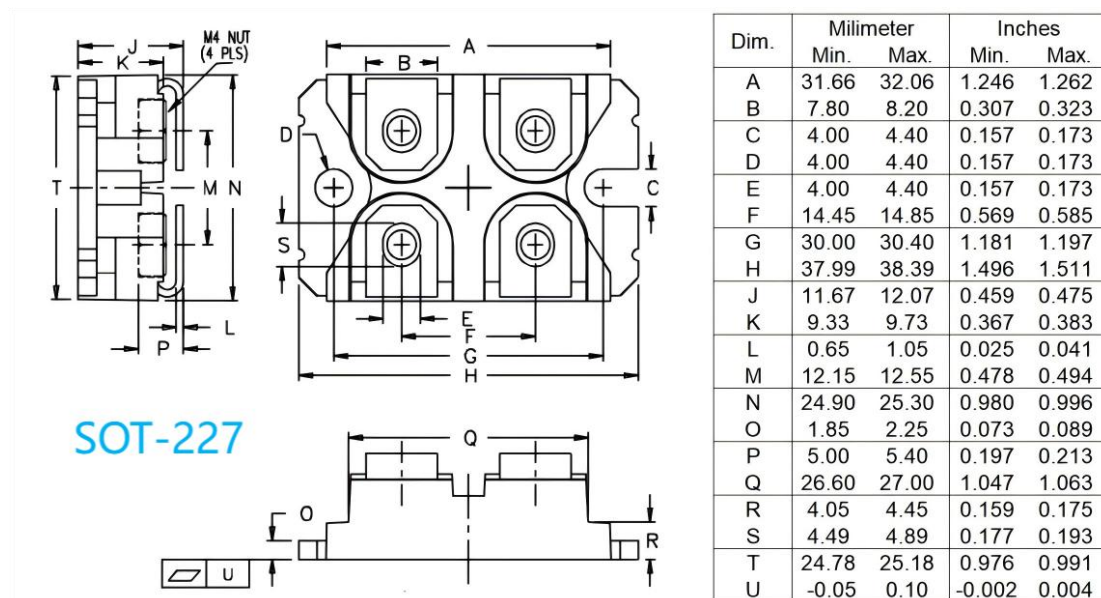
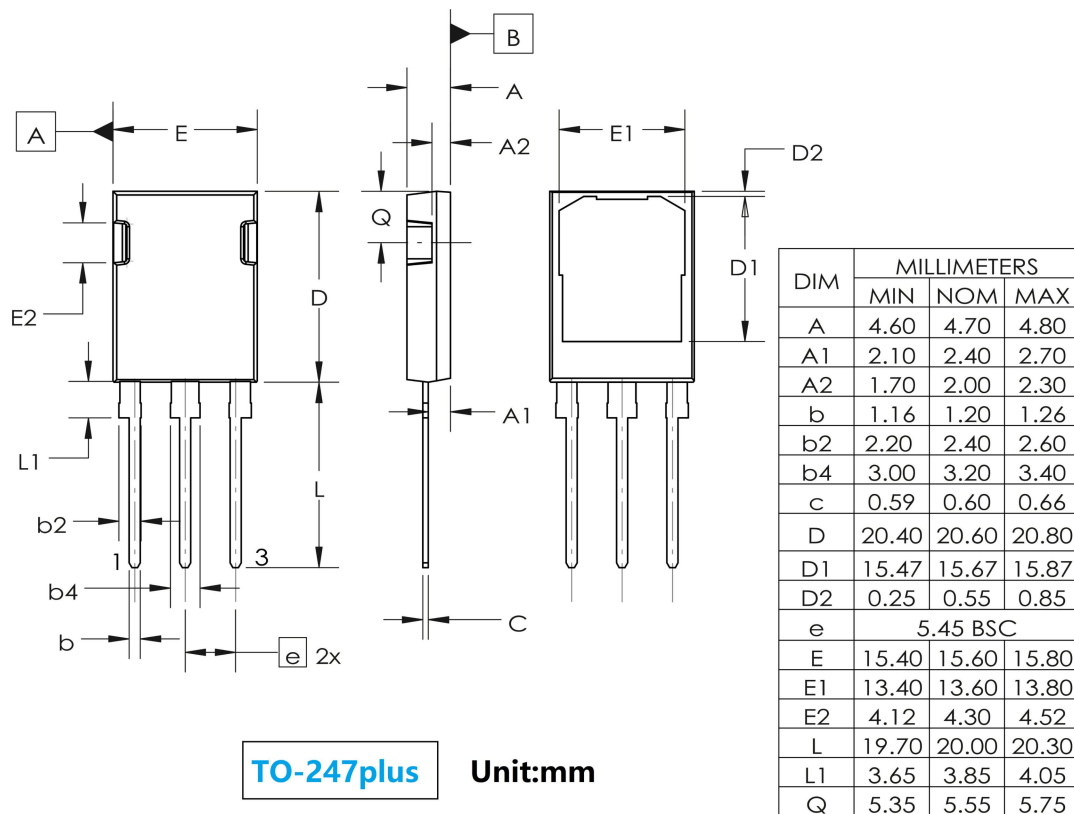
Forward Bias Safe Operating Area For SOT-227

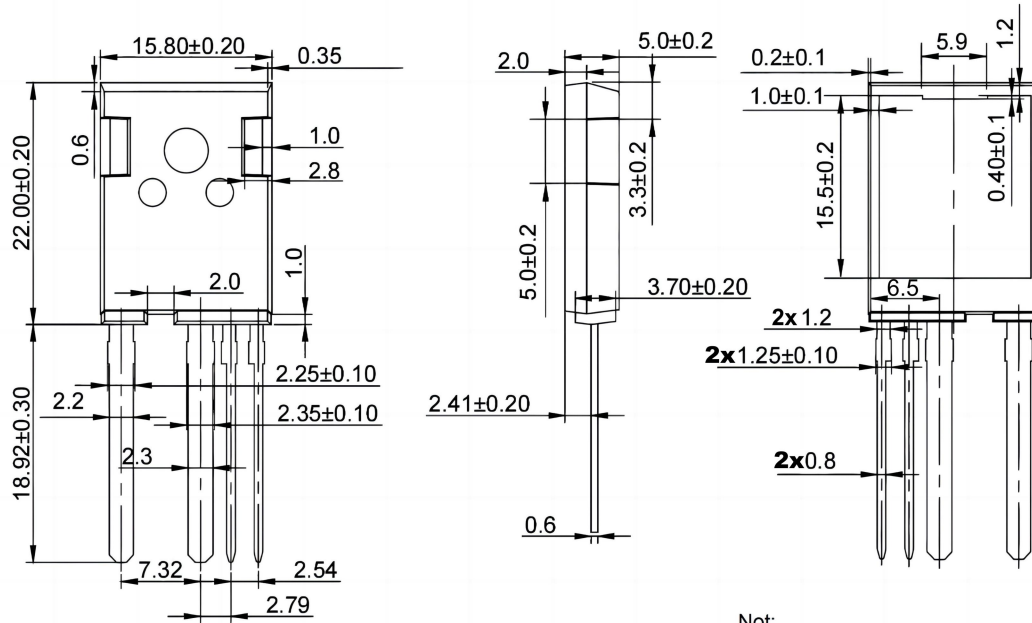


Package Mechanical DATA



TO-264 Unit:mm





Unit:mm

TO-247-4L

Not:

1. Unmarked tolerance ± 0.15
2. pitted surface Ra1.6-1.8