

“HALF-BRIDGE” IGBT MODULE

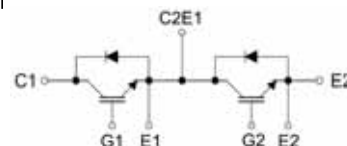
Features

- Trench gate + field stopper, using Infineon chip design
- 10μs Short circuit capability
- Low turn-off losses
- Short tail current for over 18KHz
- Positive $V_{CE(on)}$ temperature coefficient

Applications

- AC & DC Motor controls
- VVVF inverters
- Optimized for high frequency inverter Type Welding machines
- SMPS
- UPS, Robotics

$V_{CES} = 1200V$
 $I_C = 200A$
 $V_{CE(ON)} \text{ typ.} = 1.7V$
 @ $I_C = 200A$



Package : V3



Absolute Maximum Ratings @ $T_j = 25^\circ C$ (per leg)

Symbol	Parameter	Condition	Ratings	Unit
V_{CES}	Collector-to-Emitter Voltage	$V_{GE} = 0V, I_C = 1.0mA$	1200	V
V_{GES}	Gate emitter voltage		± 20	V
I_C	Continuous Collector Current	$T_C = 80^\circ C (25^\circ C)$	200(260)	A
I_{CM}	Pulsed collector current	$T_C = 25^\circ C$	400	A
I_F	Diode Continuous Forward Current	$T_C = 80^\circ C (25^\circ C)$	200(260)	A
I_{FM}	Diode Maximum Forward Current	$T_C = 25^\circ C$	400	A
T_{SC}	Short Circuit Withstand Time		10	μs
V_{iso}	Isolation Voltage test	AC 1 minute	2500	V
T_j	Junction Temperature		$-40 \sim 150$	$^\circ C$
T_{stg}	Storage Temperature		$-40 \sim 125$	$^\circ C$
Weight	Weight of Module		360	g
Mounting	Power Terminal Screw : M5		3.5	Nm
Torque	Terminal connection Screw : M5		3.5	Nm

Electrical Characteristics @ $T_j = 25^\circ C$ (unless otherwise specified)

Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage	1200	-	-	V	$V_{GE} = 0V, I_C = 1.0mA$
$V_{CE(ON)}$	Collector-to-Emitter Saturation Voltage	1.4	1.7	2.15		$I_C = 200A, V_{GE} = 15V$
$V_{GE(th)}$	Gate Threshold Voltage	5.0	5.8	6.5		$V_{CE} = V_{GE}, I_C = 500\mu A$
I_{CES}	Zero Gate Voltage Collector Current	-	-	1.0	mA	$V_{GE} = 0V, V_{CE} = 1200V$
I_{GES}	Gate-to-Emitter Leakage Current	-	-	± 200	nA	$V_{CE} = 0V, V_{GE} = \pm 20V$

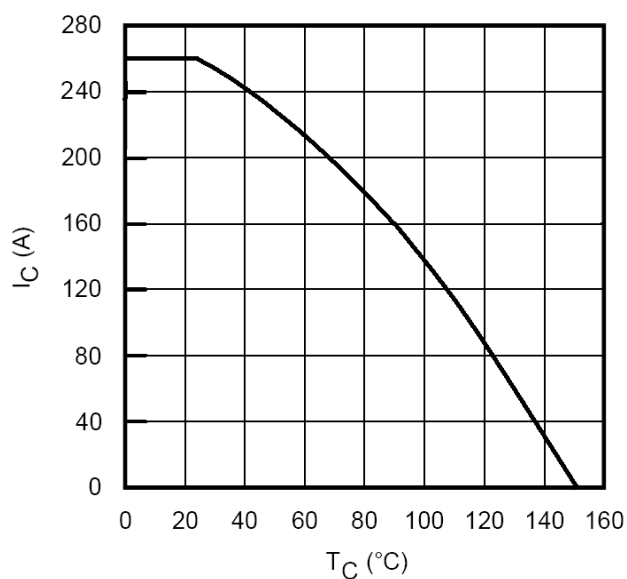
V _{FM}	Diode Forward Voltage Drop	-	1.65	2.15	V	I _C = 200A
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Switching Characteristic @ T_j = 25°C (unless otherwise specified)

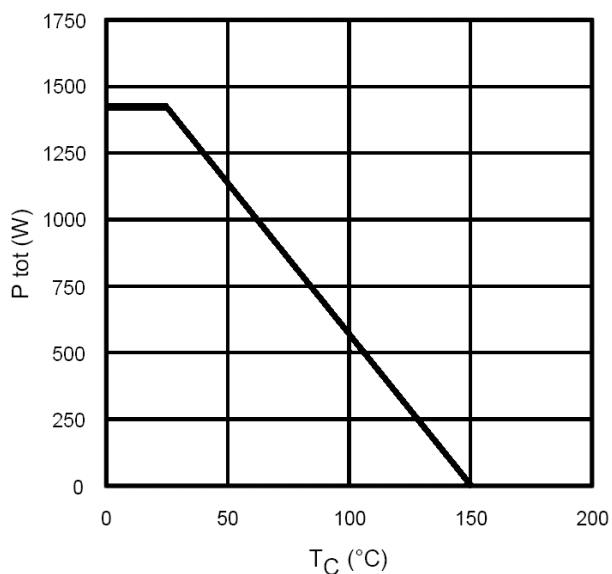
Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
C _{ies}	Input capacitance	-	17306	-	pF	V _{CC} = 30V, V _{GE} = 0V f = 1.0MHz
C _{oss}	Output capacitance	-	810	-		
C _{res}	Reverse transfer capacitance	-	360	-		
t _{d(on)}	Turn-on delay time	-	300	-	ns	T _j = 125°C, V _{CC} = 600V I _C = 200A, V _{GE} = 15V R _G = 3.6Ω
t _r	Rise time	-	108	-		
t _{d(off)}	Turn-off delay time	-	660	-		
t _f	Fall time	-	156	-		
I _{rr}	Diode Peak Reverse Recovery current	-	160	-	A	T _j = 125°C, V _{CC} = 600V I _F = 200A, V _{GE} = 15V R _G = 3.6Ω, di/dt=1200A/us
t _{rr}	Diode Reverse Recovery time	-	250	-	ns	

Thermal Characteristic Values

Symbol	Parameters	Min	Typ	Max	Unit
R _{θJC}	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.10	°C/W
R _{θJC}	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.20	
R _{θCS}	Case-to-Heat Sink (Conductive grease applied)	-	0.04	-	



**Fig 1. Maximum DC Collector Current
vs. Case Temperature**



**Fig 2. Power Dissipation vs. Case
Temperature**

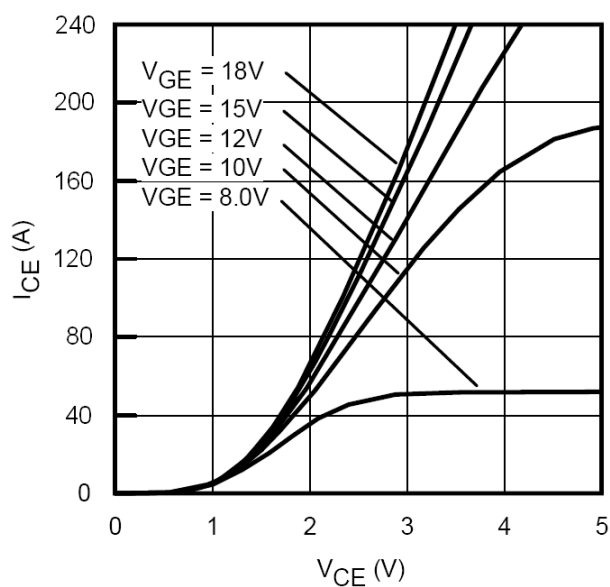


Fig 3. Typ. IGBT Output Characteristics
 $T_J = 25^\circ C$; $t_p = 80\mu s$

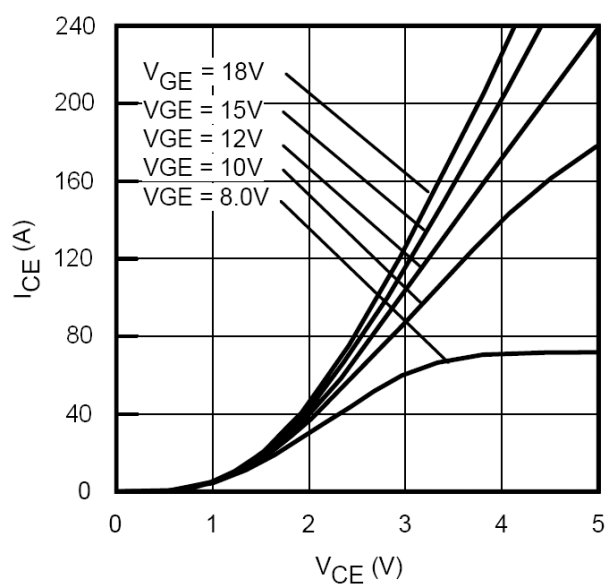


Fig 4. Typ. IGBT Output Characteristics
 $T_J = 125^\circ C$; $t_p = 80\mu s$

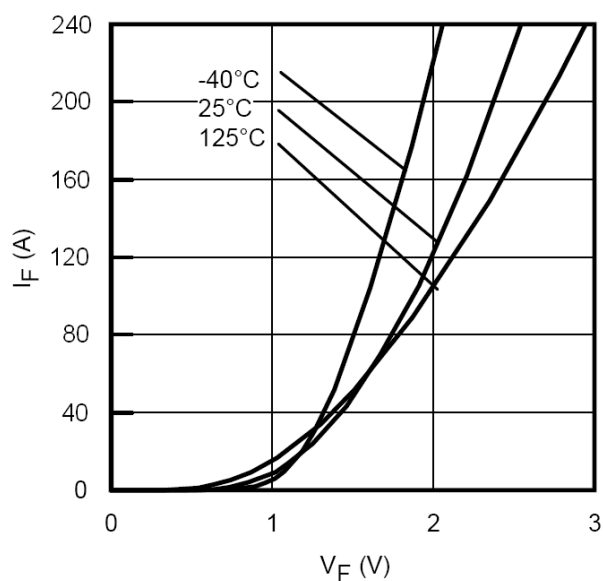


Fig 5. Typ. Diode Forward Characteristics
 $t_p = 80\mu s$

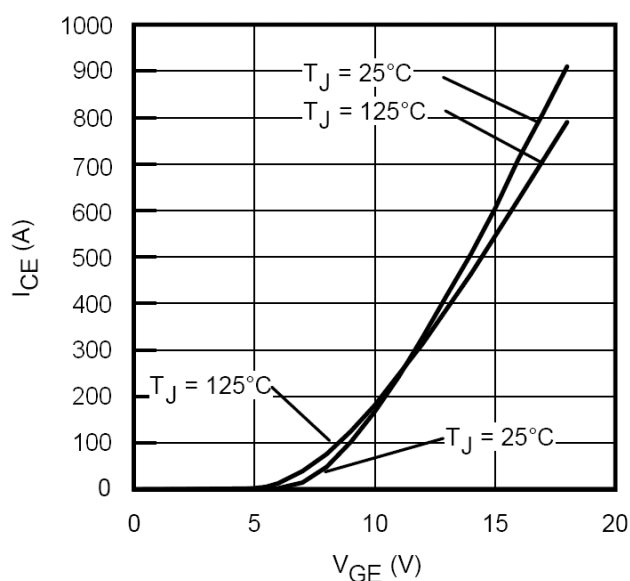


Fig 6. Typ. Transfer Characteristics
 $V_{CE} = 50V$; $t_p = 10\mu s$

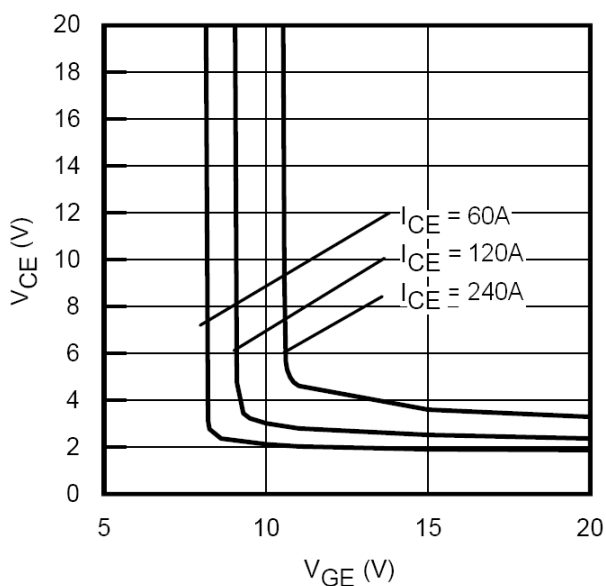


Fig 7. Typical V_{CE} vs. V_{GE}
 $T_J = 25^\circ C$

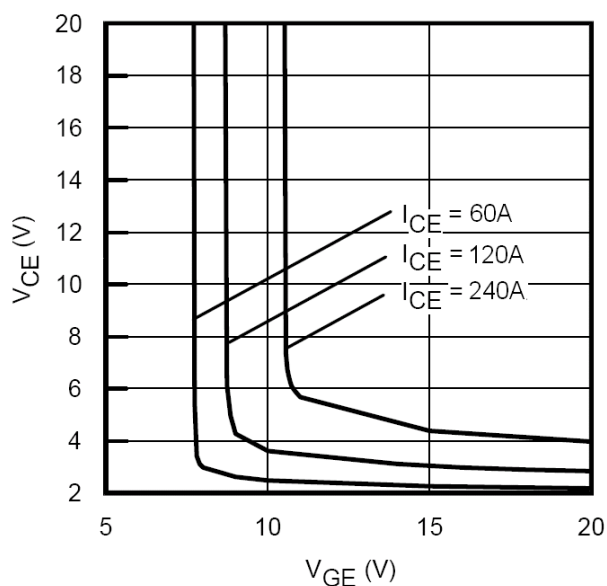


Fig 8. Typical V_{CE} vs. V_{GE}
 $T_J = 125^\circ C$

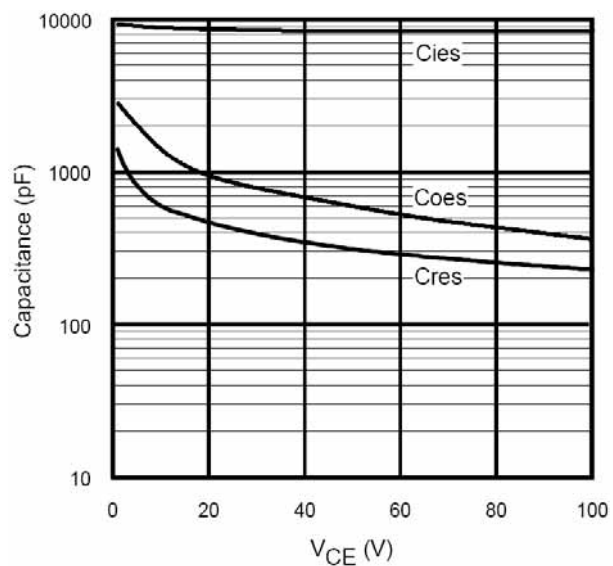


Fig 9. Typ. Capacitance vs. Vce

$V_{GE} = 0V$; $f = 1MHz$

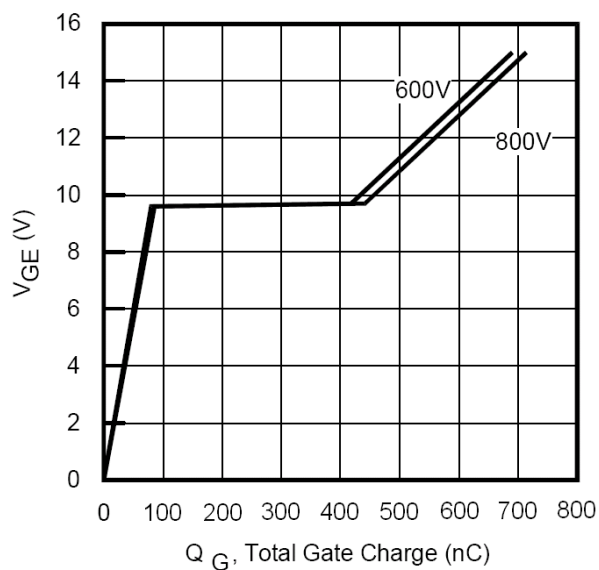


Fig 10. Typical Gate Charge vs. Vge

$I_{CE} = 120A$; $L = 600\mu H$

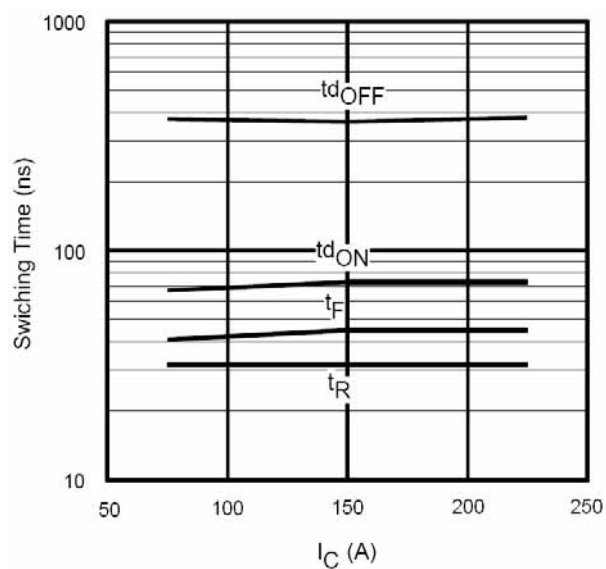


Fig 11. Typ. Switching Time vs. Ic

$T_J = 125^\circ C$; $L = 200\mu H$; $V_{CE} = 600V$

$R_G = 3.9\Omega$; $V_{GE} = 15V$

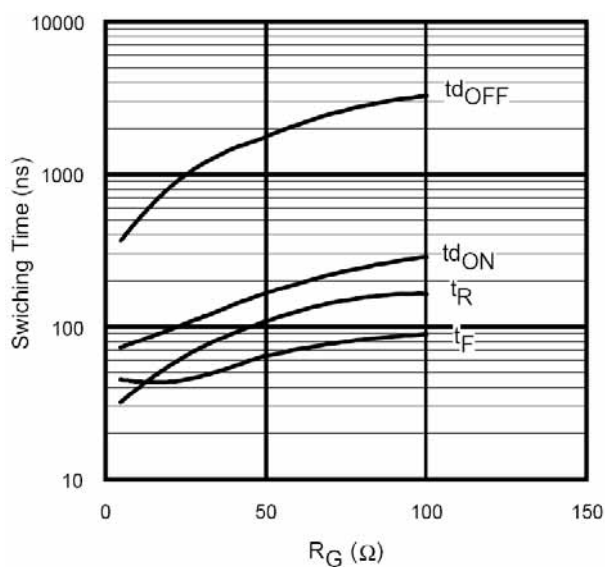


Fig 12. Typ. Switching Time vs. Rg

$T_J = 125^\circ C$; $L = 200\mu H$; $V_{CE} = 600V$

$I_{CE} = 200A$; $V_{GE} = 15V$

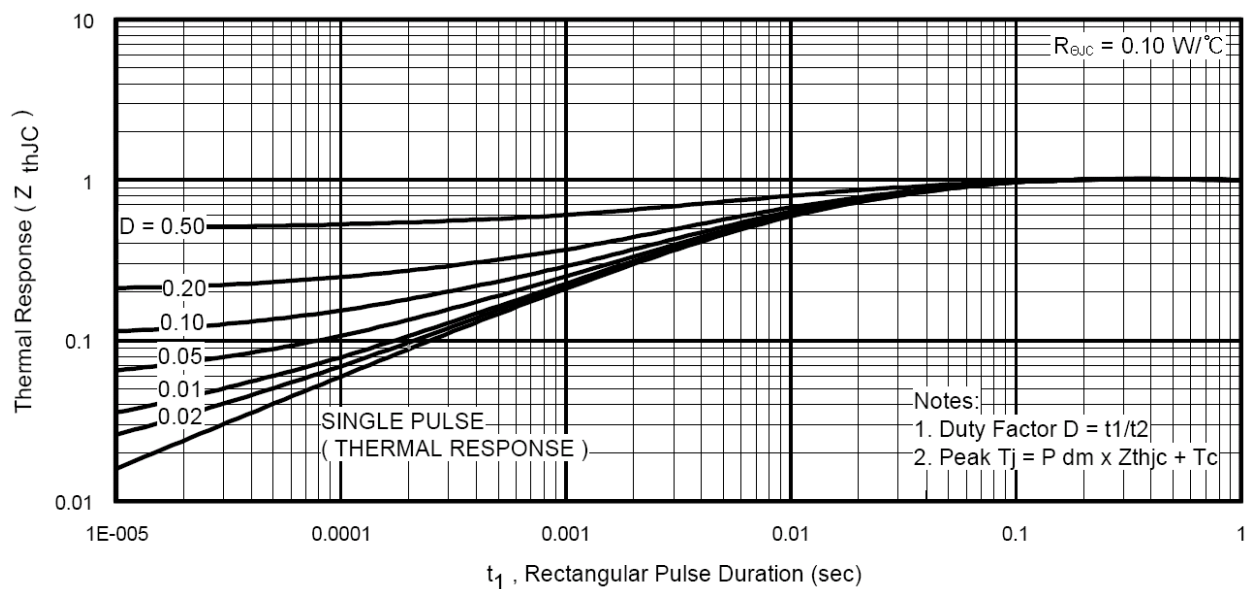


Fig 13. Normalized Transient Thermal Impedance, Junction-to-Case (IGBT)

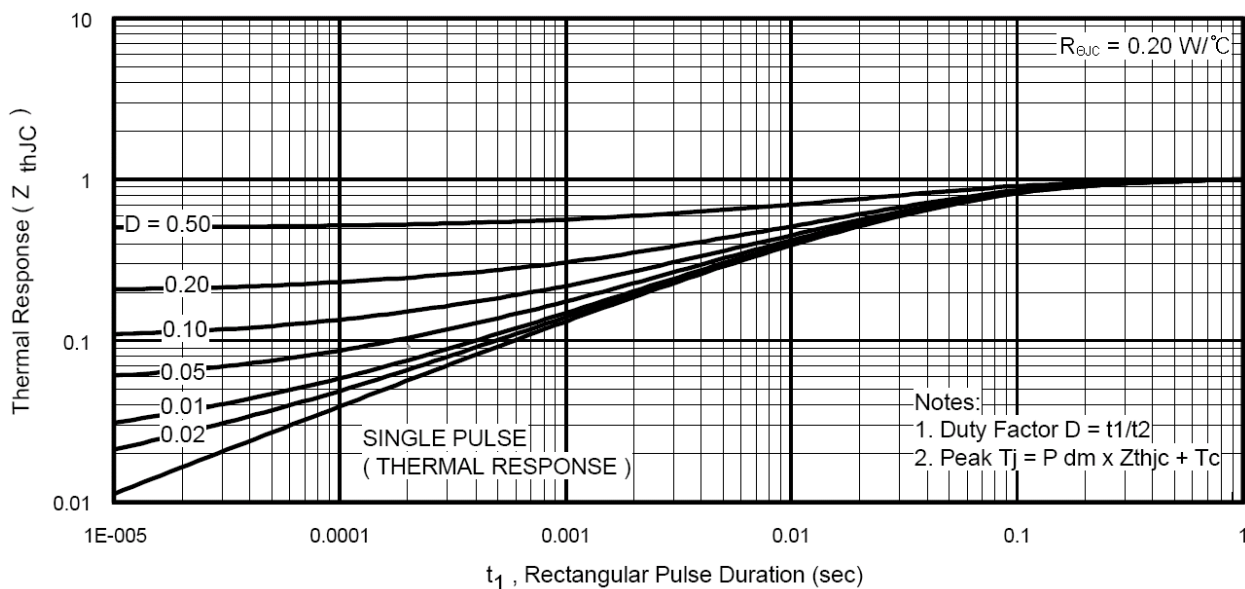
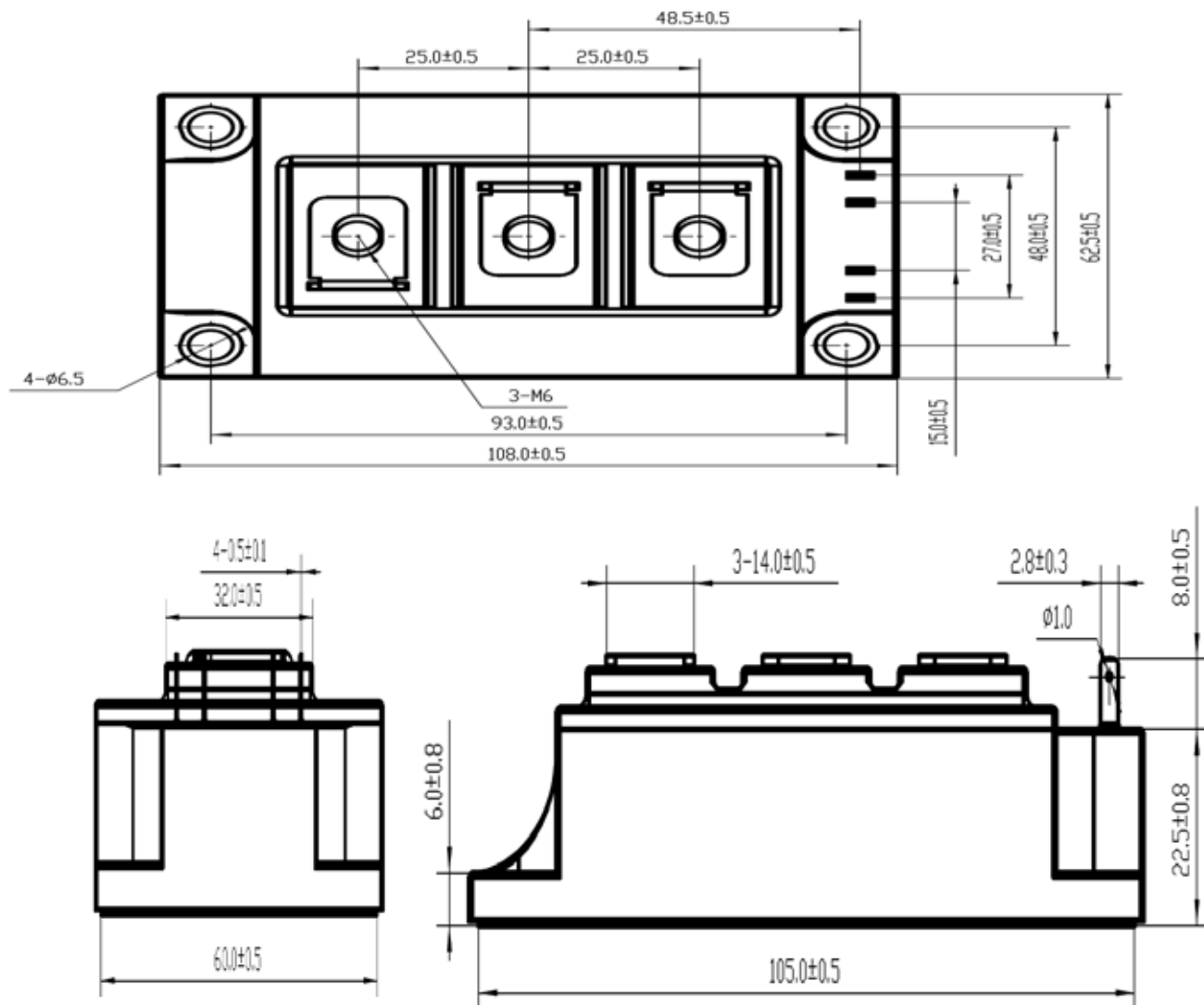


Fig 14. Normalized Transient Thermal Impedance, Junction-to-Case (DIODE)

Package Outline (dimensions in mm)



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