

“HALF-BRIDGE” IGBT

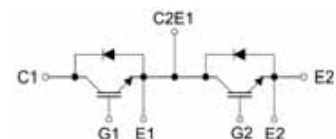
Features

- 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
- High frequency SMPS
- UPS, Robotics

$V_{CES} = 1200V$
 $I_c = 100A$
 $V_{CE(ON)}$ typ. = 1.7V
@ $I_c = 100A$



Package : V1

Absolute Maximum Ratings @ $T_c = 25$ (per leg)

Symbol	Parameter	Condition	Ratings	Unit
V_{CES}	Collector-to-Emitter Voltage	$V_{GE} = 0V, I_c = 500\mu A$	1200	V
V_{GES}	Gate emitter voltage		± 20	V
I_c	Continuous Collector Current	$T_c = 80$ (25°C)	100(140)	A
I_{CM}	Pulsed collector current	$T_c = 25$	200	A
I_F	Diode Continuous Forward Current	$T_c = 80$ (25°C)	100(140)	A
I_{FM}	Diode Maximum Forward Current	$T_c = (25^\circ C)$	200	A
T_{SC}	Short Circuit Withstand Time		10	µs
V_{iso}	Isolation Voltage test	AC 1 minute	2500	V
T_j	Junction Temperature		-40 ~ 150	
T_{stg}	Storage Temperature		-40 ~ 125	
Weight	Weight of Module		190	g
Mounting	Power Terminal Screw : M5		3.5	Nm
Torque	Terminal connection Screw : M5		3.5	Nm

Electrical Characteristics @ T_j = 25 (unless otherwise specified)

Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
V _{(BR)CES}	Collector-to-Emitter Breakdown Voltage	-	1350	1374	V	V _{GE} = 0V, I _C = 200μA
V _{CE(ON)}	Collector-to-Emitter Saturation Voltage	1.4	1.7	2.1		I _C = 100A, V _{GE} = 15V
V _{GE(th)}	Gate Threshold Voltage	4.0	5.8	6.5		V _{CE} = V _{GE} , I _C = 250μA
I _{CES}	Zero Gate Voltage Collector Current	-	-	500	μA	V _{GE} = 0V, V _{CE} = 1200V
I _{GES}	Gate-to-Emitter Leakage Current	-	-	± 100	nA	V _{CE} = 0V, V _{GE} = ± 20V
V _{FM}	Diode Forward Voltage Drop	1.4	1.7	2.1	V	I _C = 100A

Switching Characteristic @ T_j = 25 (unless otherwise specified)

Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
C _{ies}	Input capacitance	-	8653	-	pF	V _{CC} = 25V, V _{GE} = 0V f = 1.0MHz
C _{oss}	Output capacitance	-	452	-		
C _{res}	Reverse transfer capacitance	-	395	-		
t _{d(on)}	Turn-on delay time	-	342	-	ns	T _j = 125 , V _{CC} = 600V I _C = 100A, V _{GE} = ± 15V R _G = 3.9Ω
t _r	Rise time	-	45	-		
t _{d(off)}	Turn-off delay time	-	624	-		
t _f	Fall time	-	108	-		
I _{rr}	Diode Peak Reverse Recovery current	-	155	-	A	T _j = 125 , V _{CC} = 600V I _F = 100A,
t _{rr}	Diode Reverse Recovery time	-	100	-	ns	R _G = 3.9Ω, di/dt=1200A/us

Thermal Characteristic Values

Symbol	Parameters	Min	Typ	Max	Unit
R _{JC}	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.20	/W
R _{JC}	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.41	
R _{CS}	Case-to-Heat Sink (Conductive grease applied)	-	0.05	-	

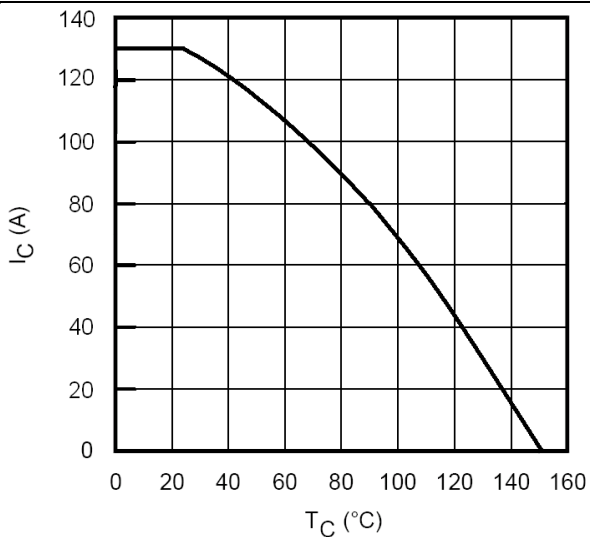


Fig 1. Maximum DC Collector Current vs. Case Temperature

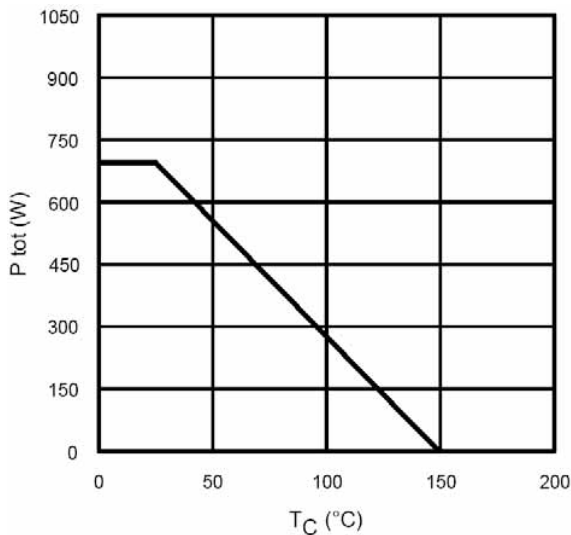


Fig 2. Power Dissipation vs. Case Temperature

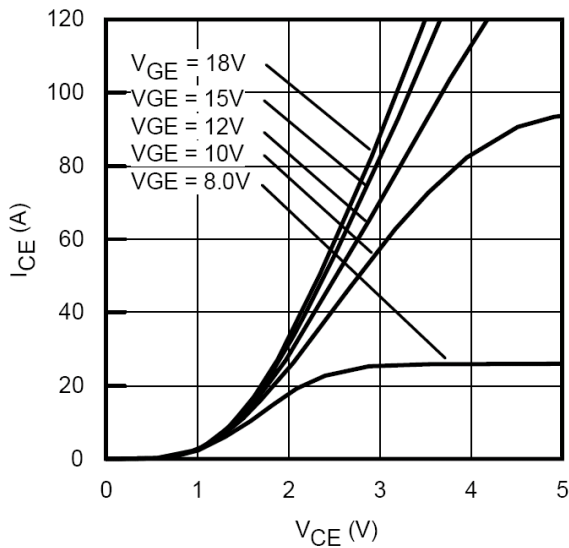


Fig 3. Typ. IGBT Output Characteristics
 $T_J = 25^\circ\text{C}$; $t_p = 80\mu\text{s}$

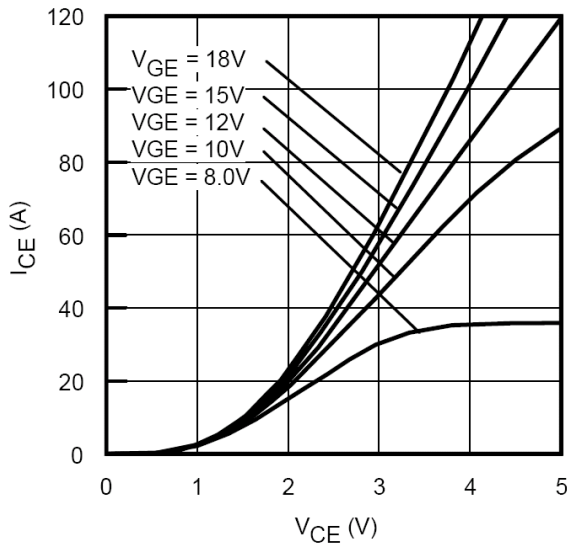


Fig 4. Typ. IGBT Output Characteristics
 $T_J = 125^\circ\text{C}$; $t_p = 80\mu\text{s}$

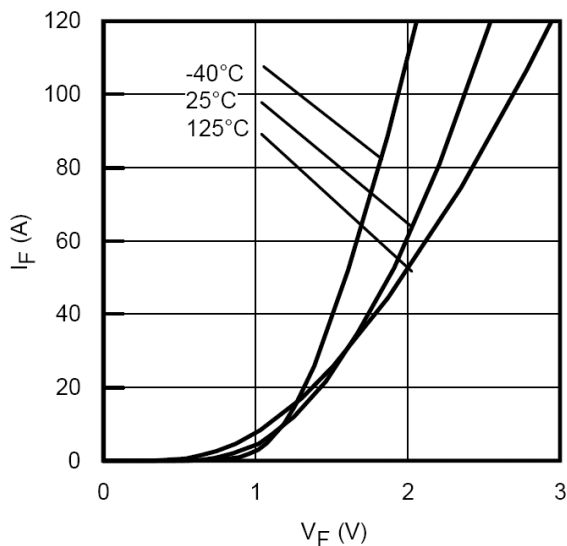


Fig 5. Typ. Diode Forward Characteristics
 $t_p = 80\mu s$

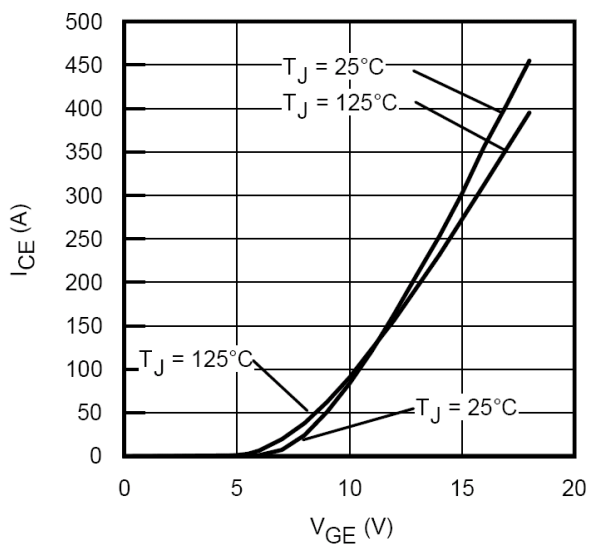


Fig 6. Typ. Transfer Characteristics
 $V_{CE} = 50V; t_p = 10\mu s$

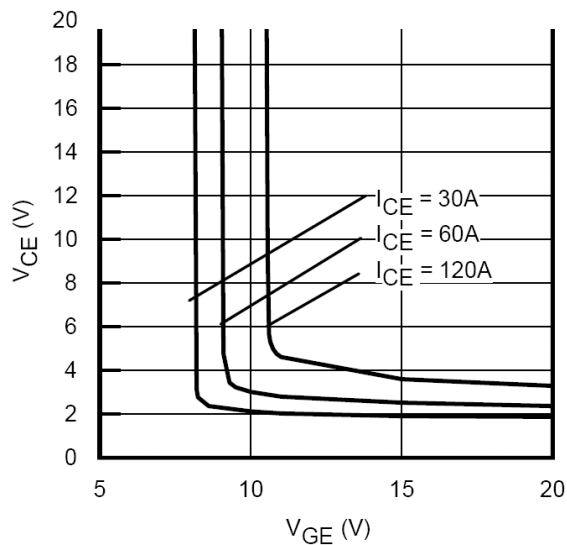


Fig 7. Typical V_{CE} vs. V_{GE}
 $T_J = 25$

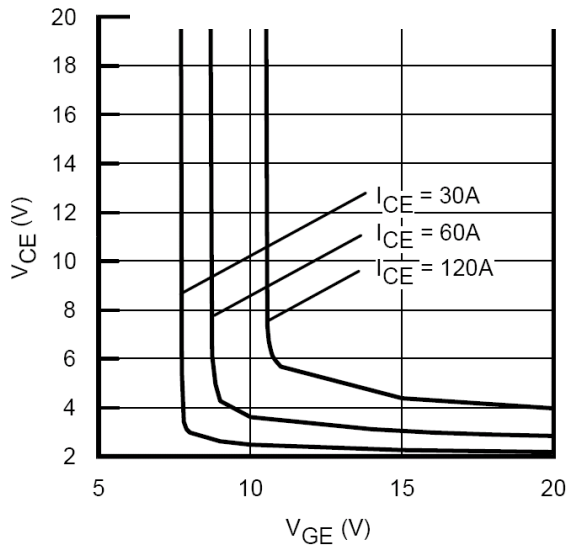


Fig 8. Typical V_{CE} vs. V_{GE}
 $T_J = 125$

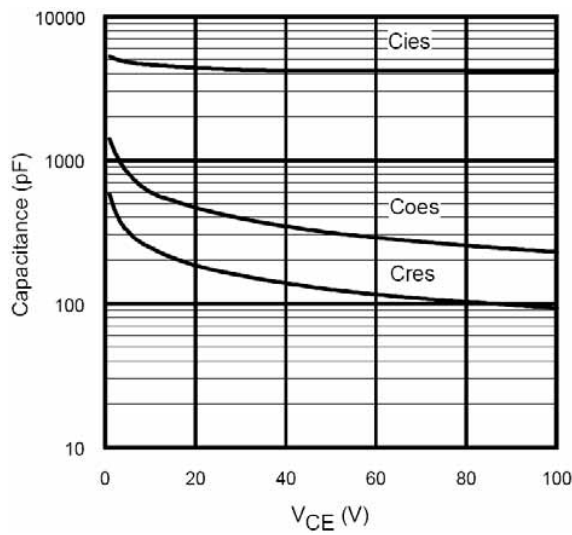


Fig 9. Typ. Capacitance vs. V_{CE}

V_{GE} = 0V; f = 1Mhz

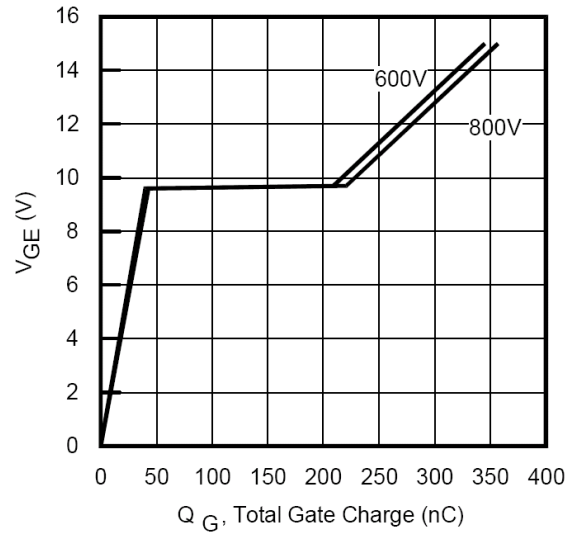


Fig 10. Typical Gate Charge vs. V_{GE}

I_{CE} = 60A; L = 600μH

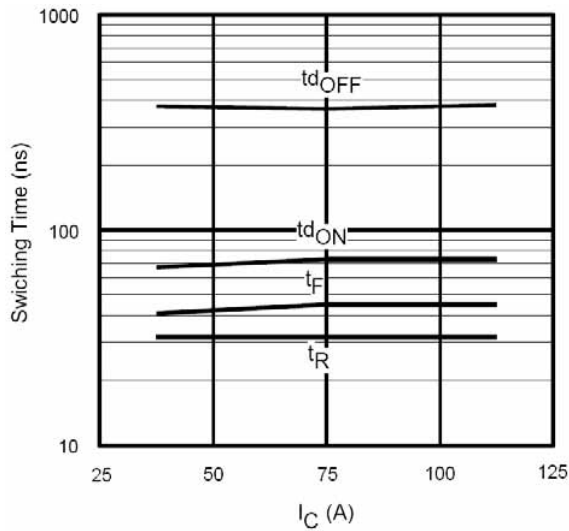


Fig 11. Typ. Switching Time vs. I_C

T_J = 125 ; L = 200μH; V_{CE} = 600V

R_G = 3.9Ω; V_{GE} = 15V

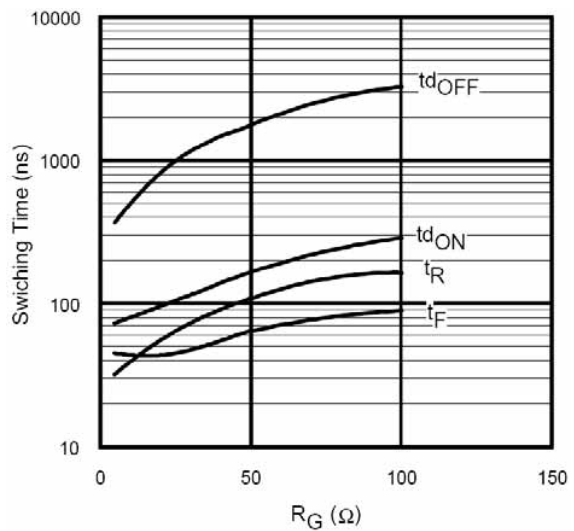


Fig 12. Typ. Switching Time vs. R_G

T_J = 125 ; L = 200μH; V_{CE} = 600V

I_{CE} = 100A; V_{GE} = 15V

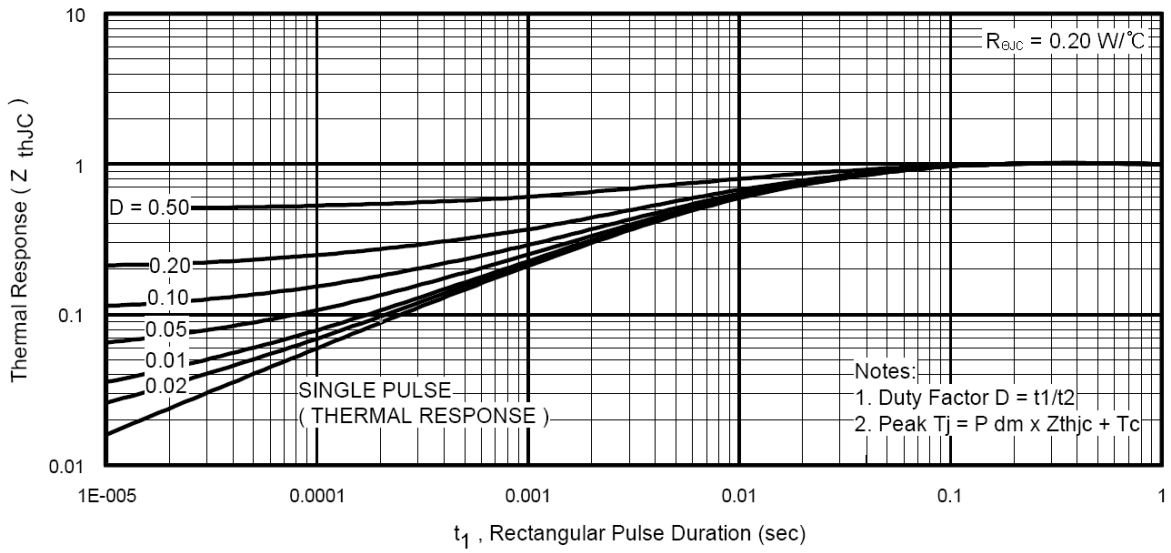


Fig 13. Normalized Transient Thermal Impedance, Junction-to-Case (IGBT)

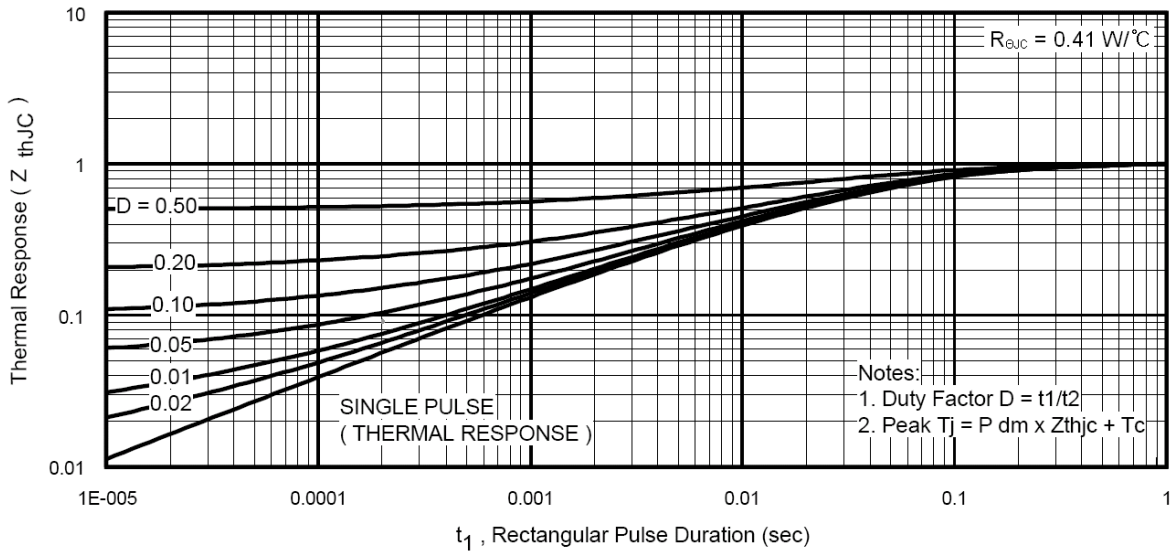
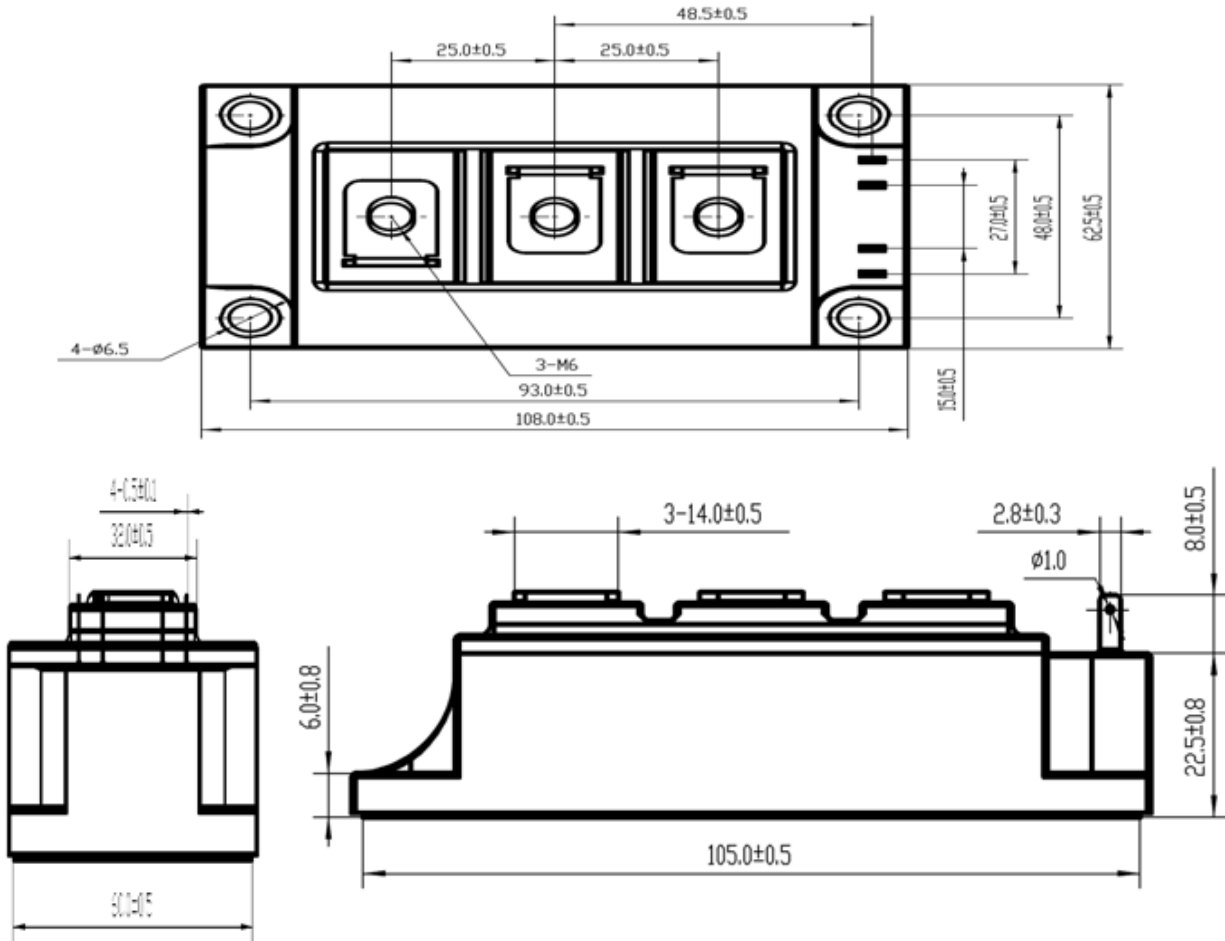


Fig 14. Normalized Transient Thermal Impedance, Junction-to-Case (DIODE)

Package Outline (dimensions in mm)



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Headquarter:

#602, B/D, 402 BLD, BLK4, Techno-park, Wonmi-Gu,
Bucheon-City, S.KOREA
Tel)+82-32-234-4781, Fax)+82-32-234-4789

Sales & Marketing

Marketing: clzhang@semiwell.com
Sales: sales@semiwell.com
WEB-site: WWW. Semiwell.com