

“HALF-BRIDGE” IGBT Module

Features

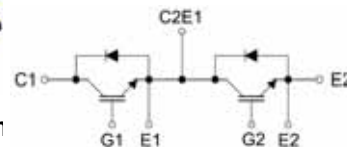
- Update NPT Technology design
- 10μs Short circuit capability
- Low turn-off loss
- Short tail current for over 18KHz
- Positive $V_{CE(on)}$ temperature coefficient

Applications

- SMPS & Electrolysis Machine
- High Power Inverters
- High Frequency inverter-type Welding machines
- Servo Controls
- UPS, EPS or Robotics



PKG V3 62 mm



$V_{CES} = 1200V$
 $I_C = 150A$
 $V_{CE(ON)} \text{ typ.} = 2.7V$
 @ $I_C = 150A$

Absolute Maximum Ratings @ $T_j = 25$ (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	$T_C = 80$	150	A
I_{CM}	Pulsed collector current	$T_C = 80$	300	A
I_F	Diode Continuous Forward Current	$T_C = 80$	150	A
I_{FM}	Diode Maximum Forward Current		300	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		360	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	1200	-	-	V	$V_{GE} = 0V, I_C = 1.0mA$
$V_{CE(ON)}$	Collector-to-Emitter Saturation Voltage	-	2.7	3.1		$I_C = 150A, V_{GE} = 15V$
$V_{GE(th)}$	Gate Threshold Voltage		5.0	6.0		$V_{CE} = V_{GE}, I_C = 500\mu A$
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	-	2.1	2.4	V	$I_C = 150A$

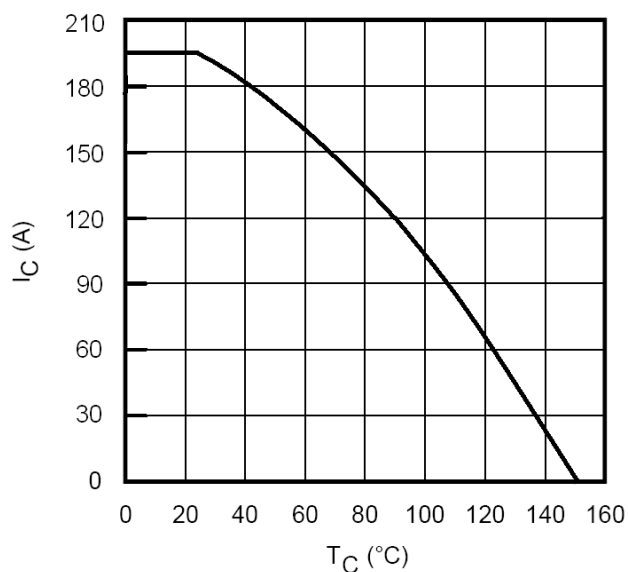
www.semiwell.com

Switching Characteristic @ $T_j = 25$ (unless otherwise specified)

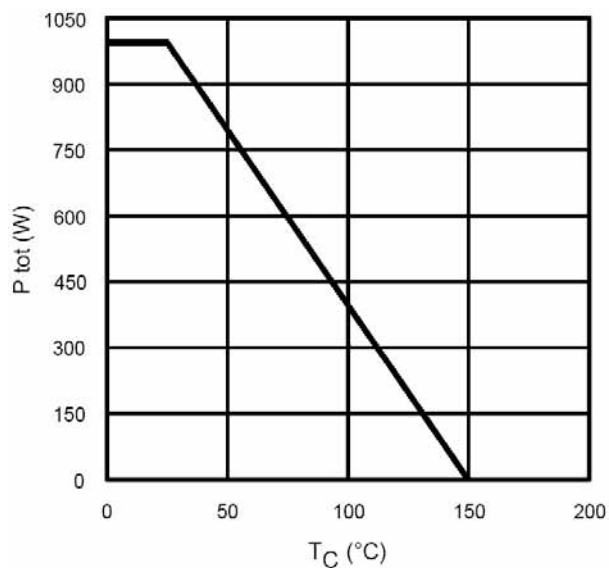
Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
C_{ies}	Input capacitance	-	8200	-	pF	$V_{CC} = 30V$, $V_{GE} = 0V$ $f = 1.0MHz$
C_{oss}	Output capacitance	-	790	-		
C_{res}	Reverse transfer capacitance	-	320	-		
$t_{d(on)}$	Turn-on delay time	-	105	-	ns	$T_j = 125$, $V_{CC} = 600V$ $I_C = 150A$, $V_{GE} = 15V$ $R_G = 4.7\Omega$
t_r	Rise time	-	45	-		
$t_{d(off)}$	Turn-off delay time	-	425	-		
t_f	Fall time	-	58	-		
I_{rr}	Diode Peak Reverse Recovery current	-	55	-	A	$T_j = 125$, $V_{CC} = 600V$ $I_F = 150A$, $V_{GE} = 15V$ $R_G = 4.7\Omega$, $di/dt=1200A/us$
t_{rr}	Diode Reverse Recovery time	-	185	-	ns	

Thermal Characteristic Values

Symbol	Parameters	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.15	/W
$R_{\theta JC}$	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.30	
$R_{\theta CS}$	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**

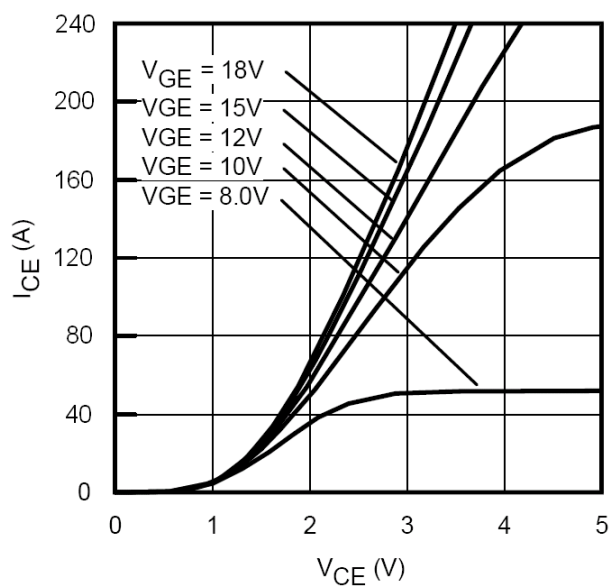


Fig 3. Typ. IGBT Output Characteristics
 $T_J = 25$; $t_p = 80\mu s$

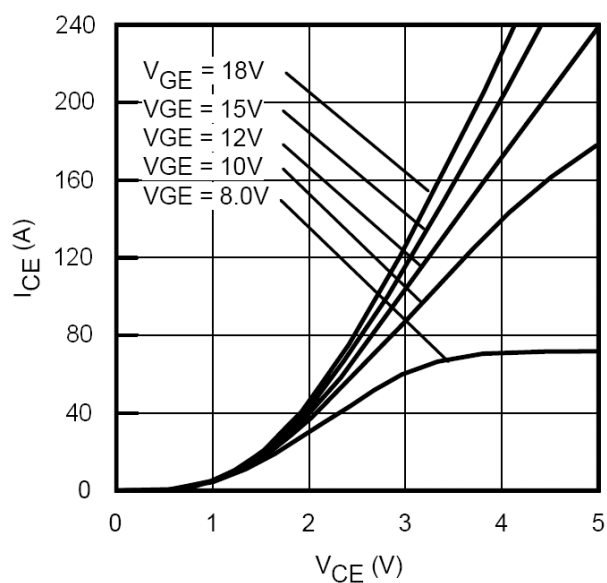


Fig 4. Typ. IGBT Output Characteristics
 $T_J = 125$; $t_p = 80\mu s$

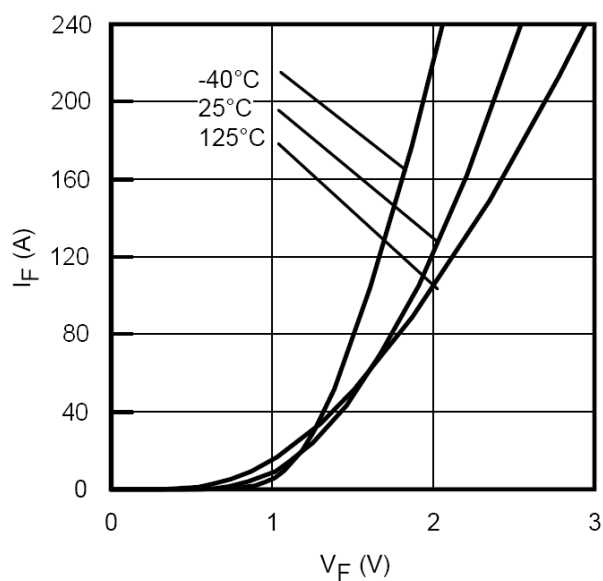


Fig 5. Typ. Diode Forward Characteristics

$t_p = 80\mu s$

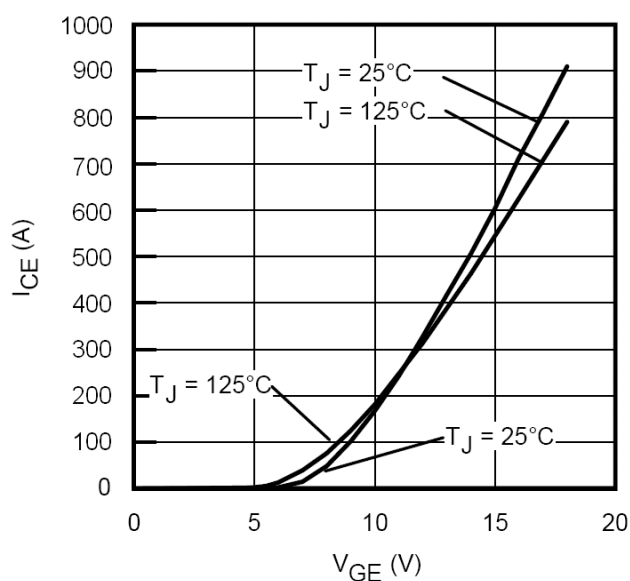


Fig 6. Typ. Transfer Characteristics

$V_{CE} = 50V$; $t_p = 10\mu s$

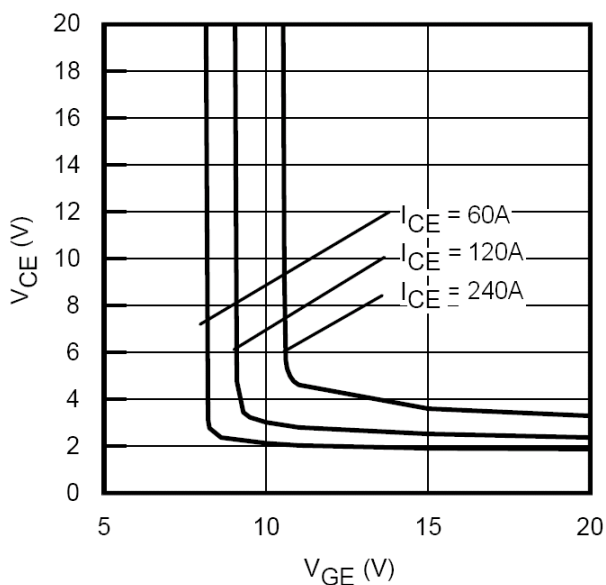


Fig 7. Typical V_{CE} vs. V_{GE}

$T_J = 25$

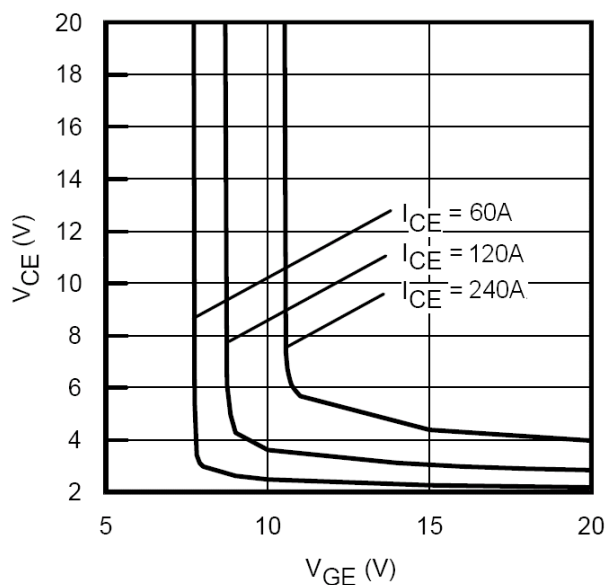


Fig 8. Typical V_{CE} vs. V_{GE}

$T_J = 125$

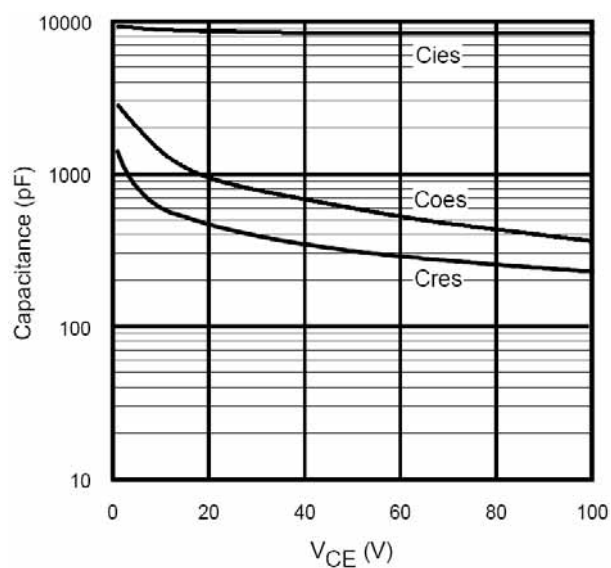


Fig 9. Typ. Capacitance vs. V_{CE}

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

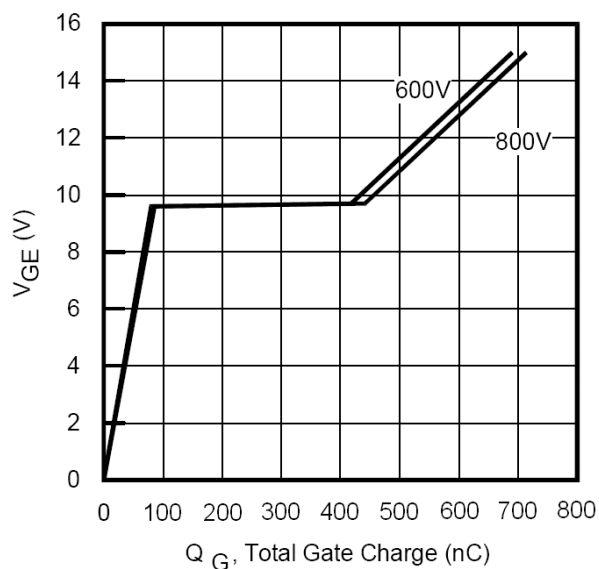


Fig 10. Typical Gate Charge vs. V_{GE}

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

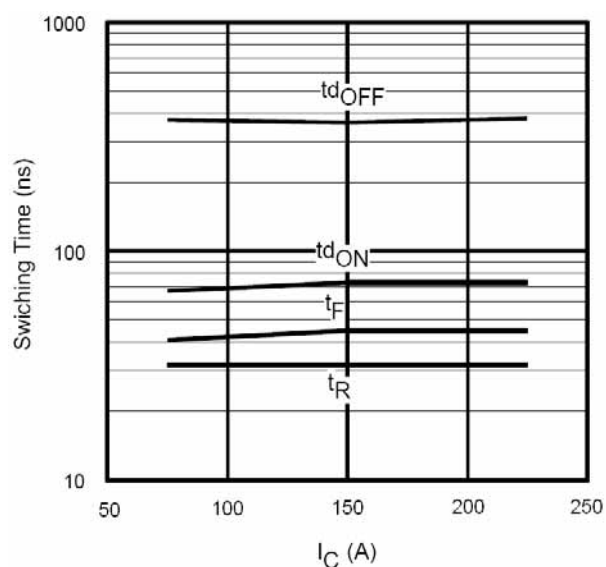


Fig 11. Typ. Switching Time vs. I_C

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

$R_G = 4.7\Omega$; $V_{GE} = 15V$

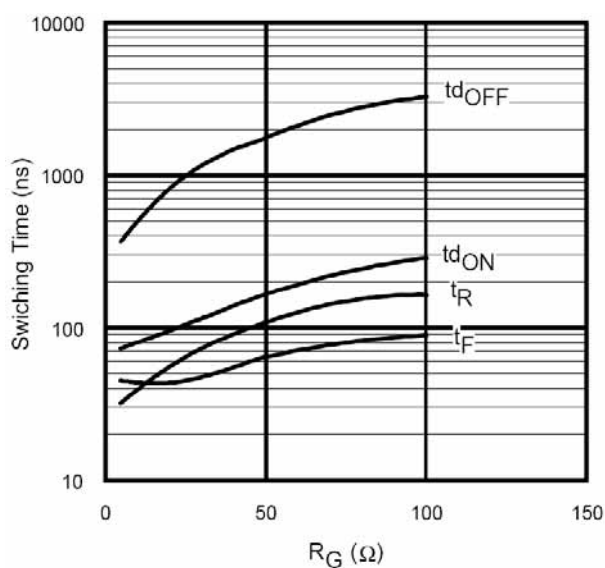


Fig 12. Typ. Switching Time vs. R_G

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

$I_{CE} = 150A$; $V_{GE} = 15V$

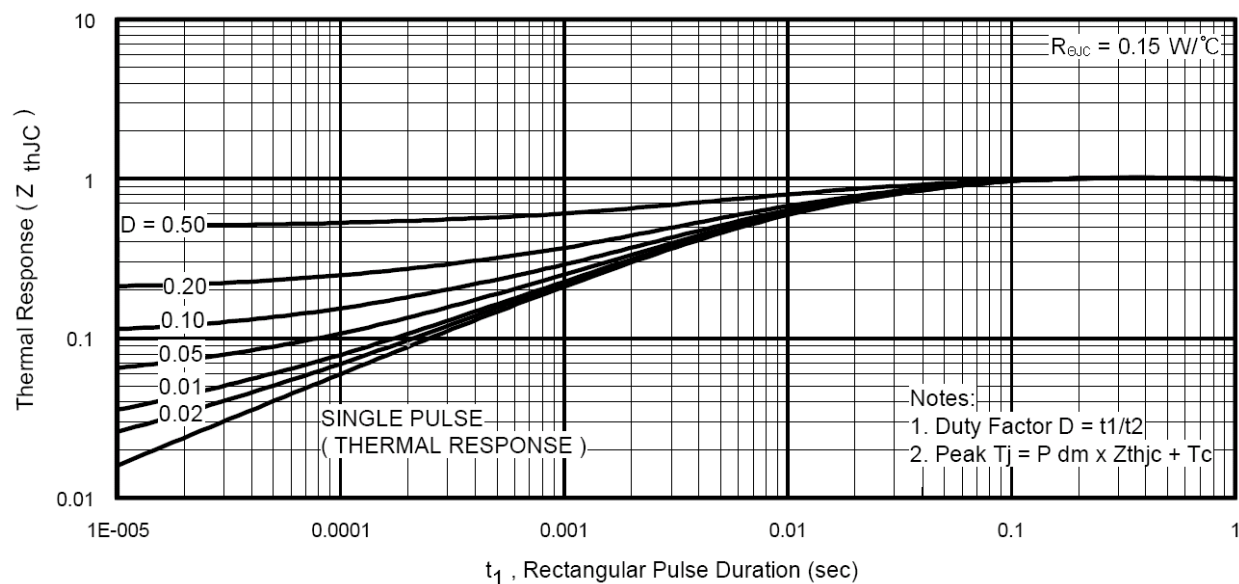


Fig 13. Normalized Transient Thermal Impedance, Junction-to-Case (IGBT)

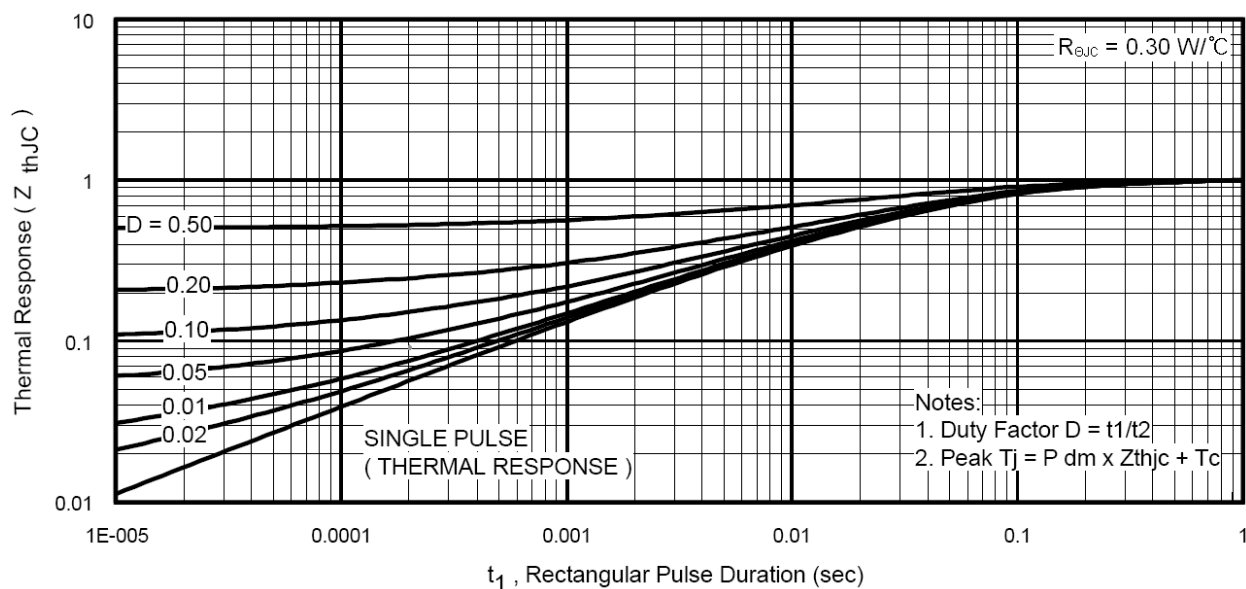
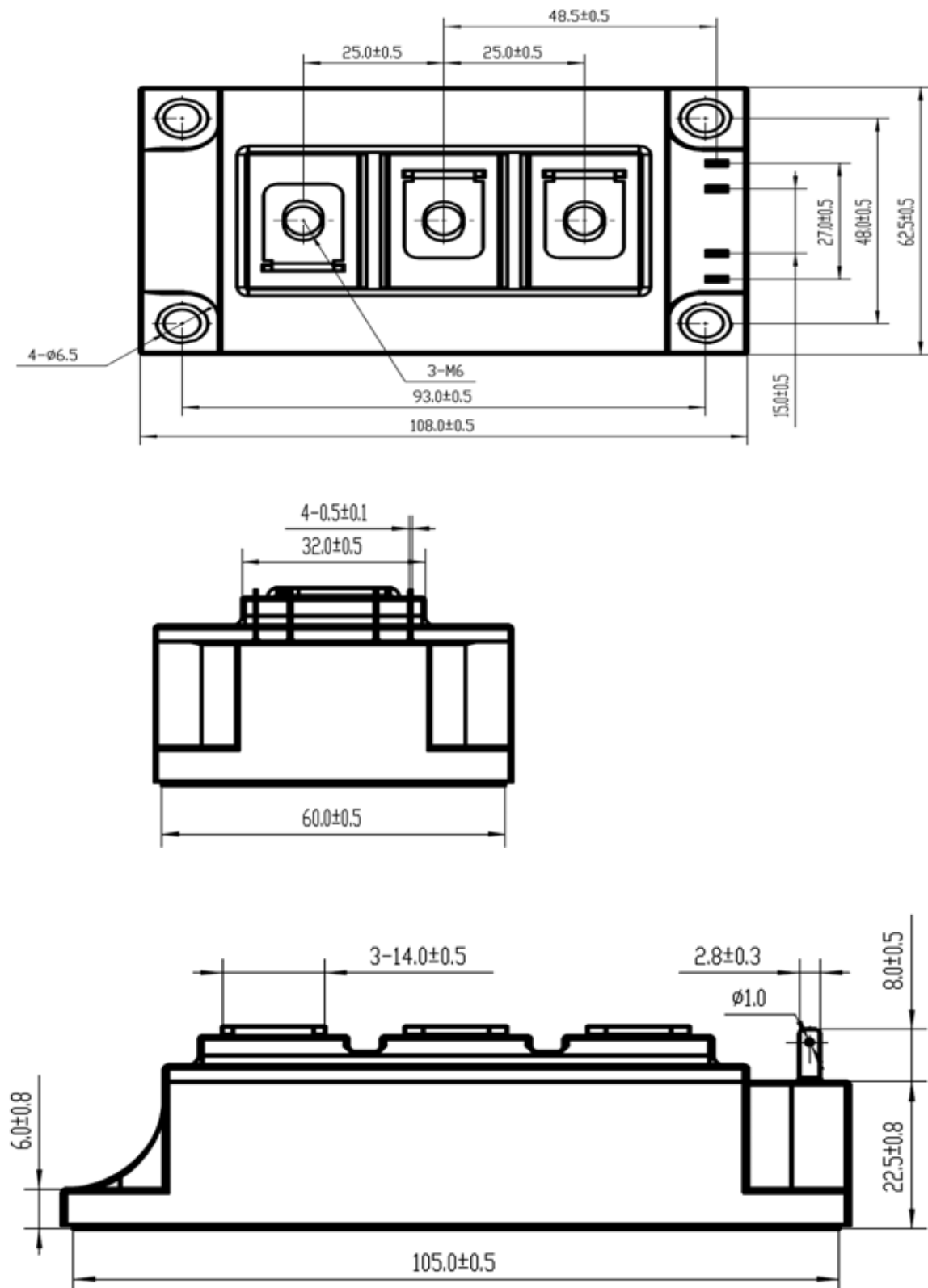


Fig 14. Normalized Transient Thermal Impedance, Junction-to-Case (DIODE)

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

Web-site: www.semiwell.com

E-mail: sales@semiwell.com

Marketing: clzhang@semiwell.com