

“HALF-BRIDGE” IGBT Module

V_{CES} = 1200V
I_c = 150A
V_{CE(ON)} typ. = 2.7V
@ I_c = 150A

Features

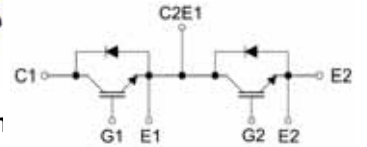
- Update NPT Technology design
- 10μs Short circuit capability
- Low turn-off loss
- Short tail current for over 18KHz
- Positive V_{CE(on)} temperature coefficient

Applications

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



PKG V3 62 mm



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 = 500μA
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} = ± 20V
V _{FM}	Diode Forward Voltage Drop	-	2.1	2.4	V	I _c = 150A

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_{JC}	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.15	/W
R_{JC}	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.30	
R_{CS}	Case-to-Heat Sink (Conductive grease applied)	-	0.04	-	

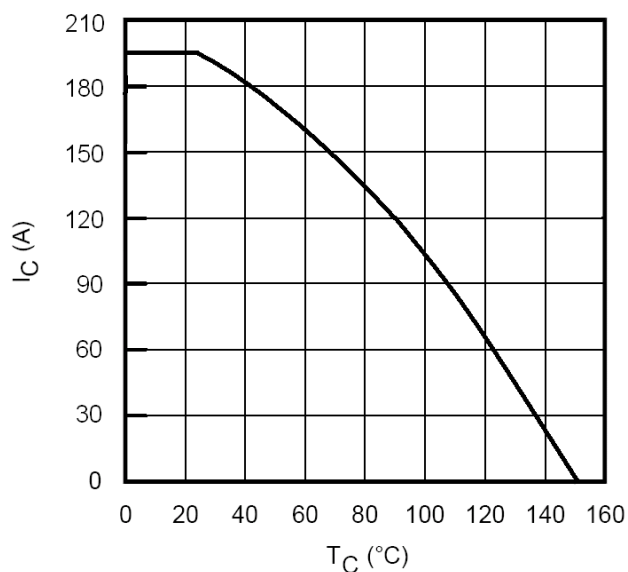


Fig 1. Maximum DC Collector Current vs. Case Temperature

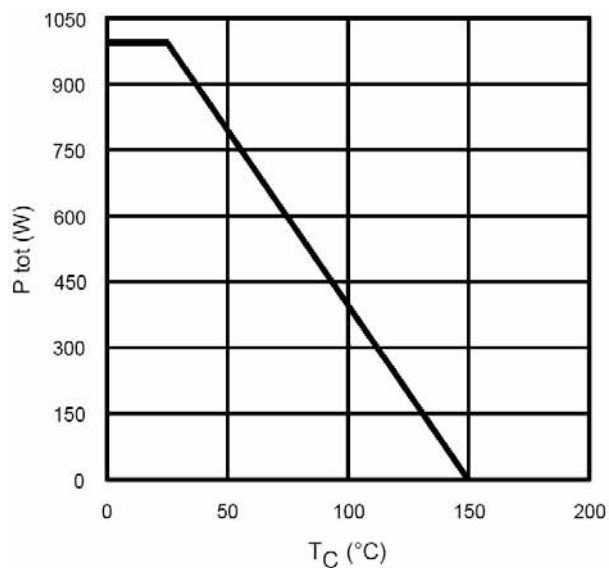


Fig 2. Power Dissipation vs. Case Temperature

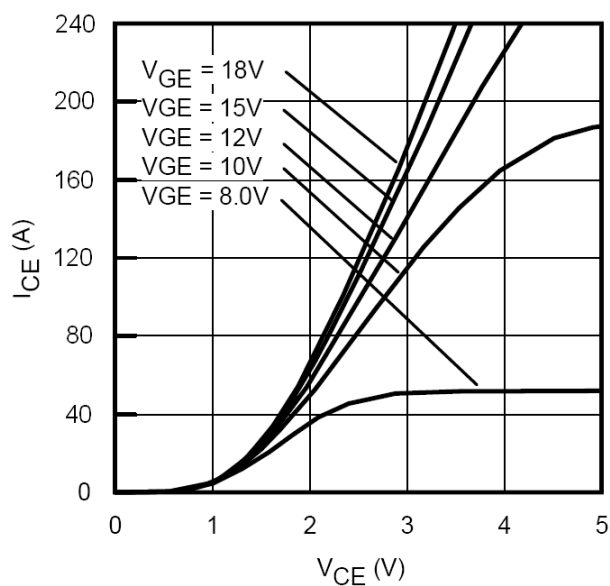


Fig 3. Typ. IGBT Output Characteristics
 $T_J = 25^\circ\text{C}$; $t_p = 80\mu\text{s}$

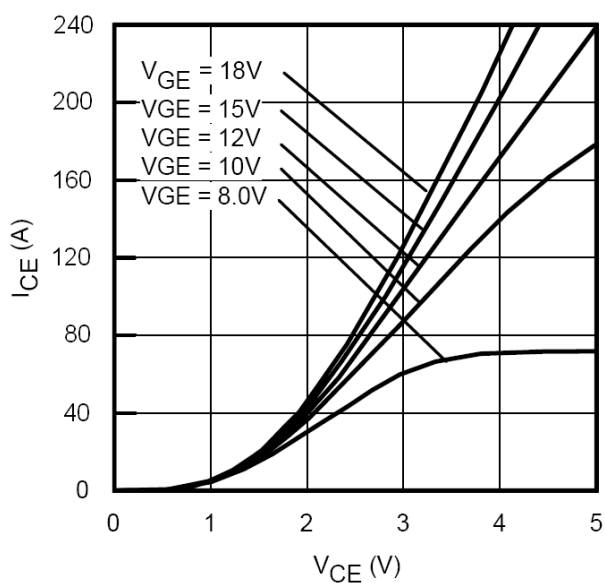


Fig 4. Typ. IGBT Output Characteristics
 $T_J = 125^\circ\text{C}$; $t_p = 80\mu\text{s}$

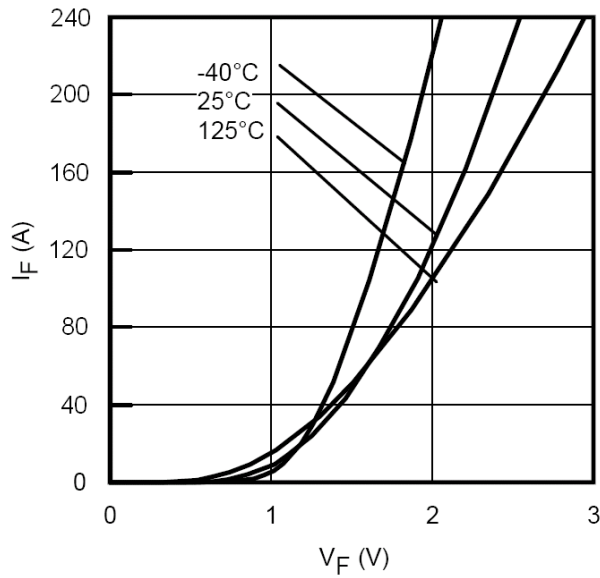


Fig 5. Typ. Diode Forward Characteristics

tp = 80μs

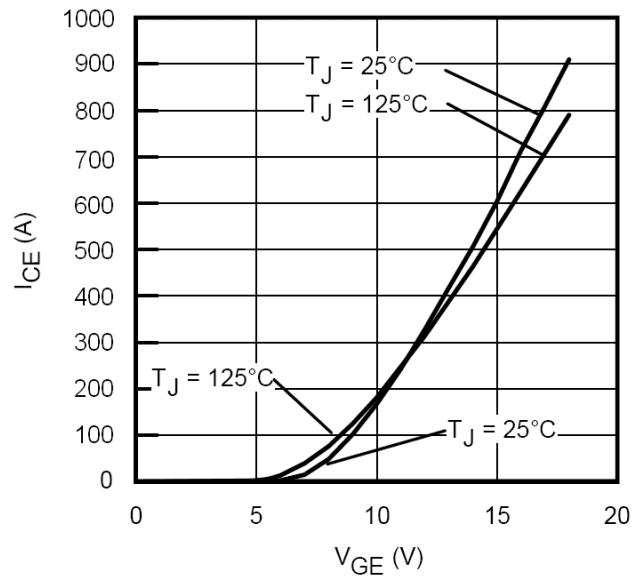


Fig 6. Typ. Transfer Characteristics

VCE = 50V; tp = 10μs

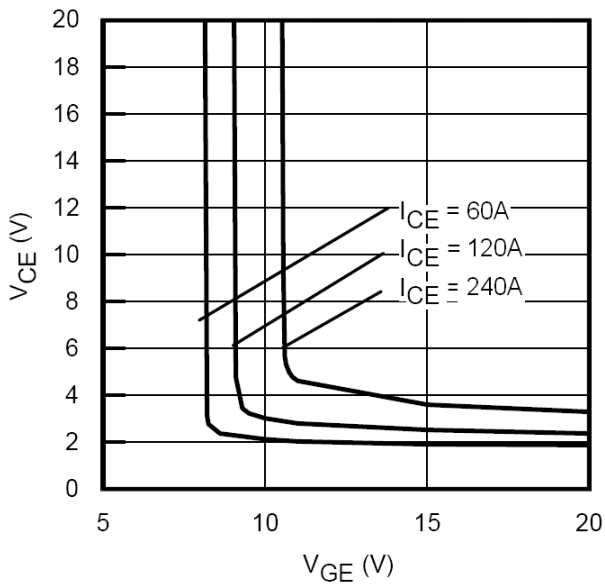


Fig 7. Typical VCE vs. VGE

TJ = 25

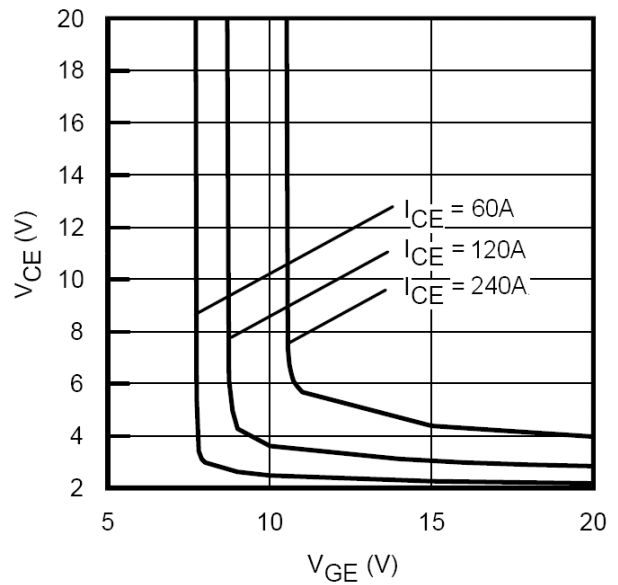


Fig 8. Typical VCE vs. VGE

TJ = 125

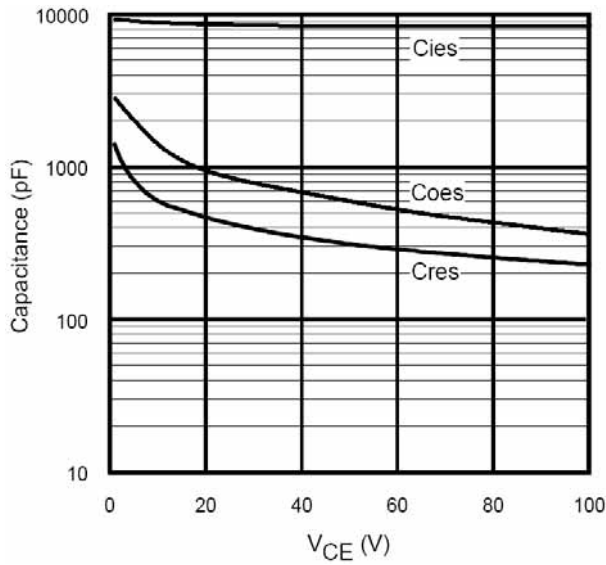


Fig 9. Typ. Capacitance vs. V_{CE}

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

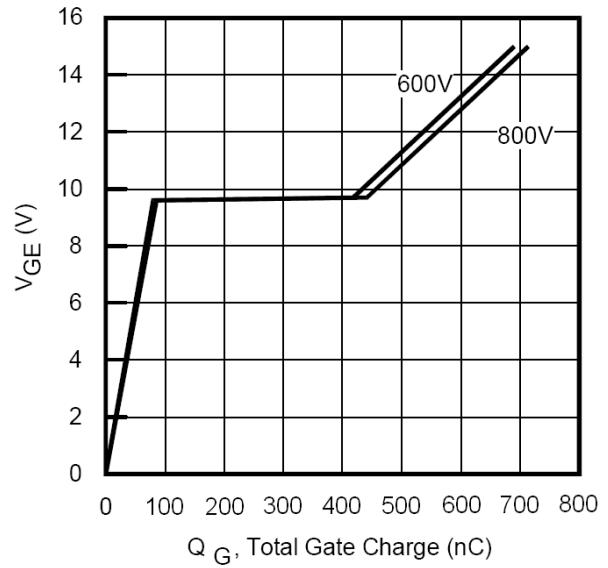


Fig 10. Typical Gate Charge vs. V_{GE}

I_{CE} = 120A; L = 600μH

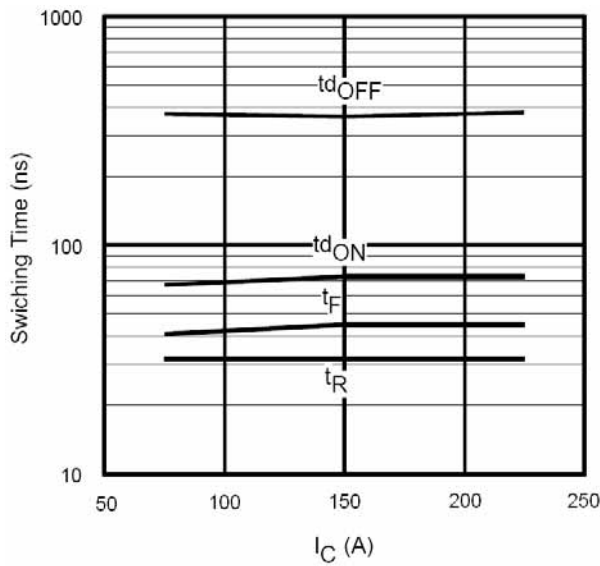


Fig 11. Typ. Switching Time vs. I_C

T_J = 125 ; L = 200μH; V_{CE} = 600V
R_G = 4.7Ω; V_{GE} = 15V

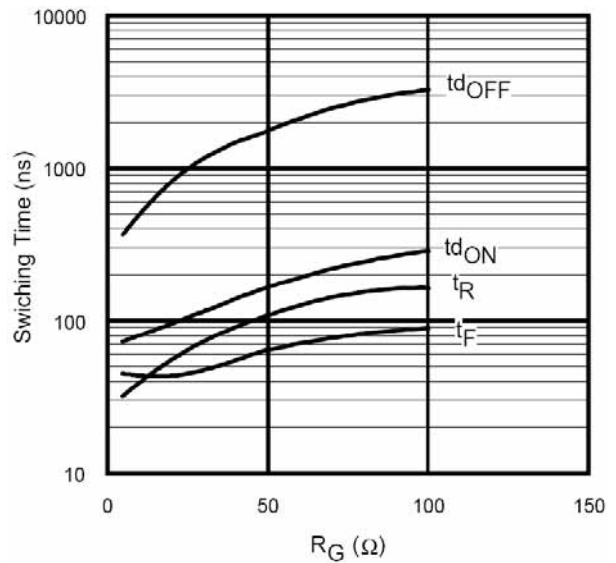


Fig 12. Typ. Switching Time vs. R_G

T_J = 125 ; L = 200μH; V_{CE} = 600V
I_{CE} = 150A; V_{GE} = 15V

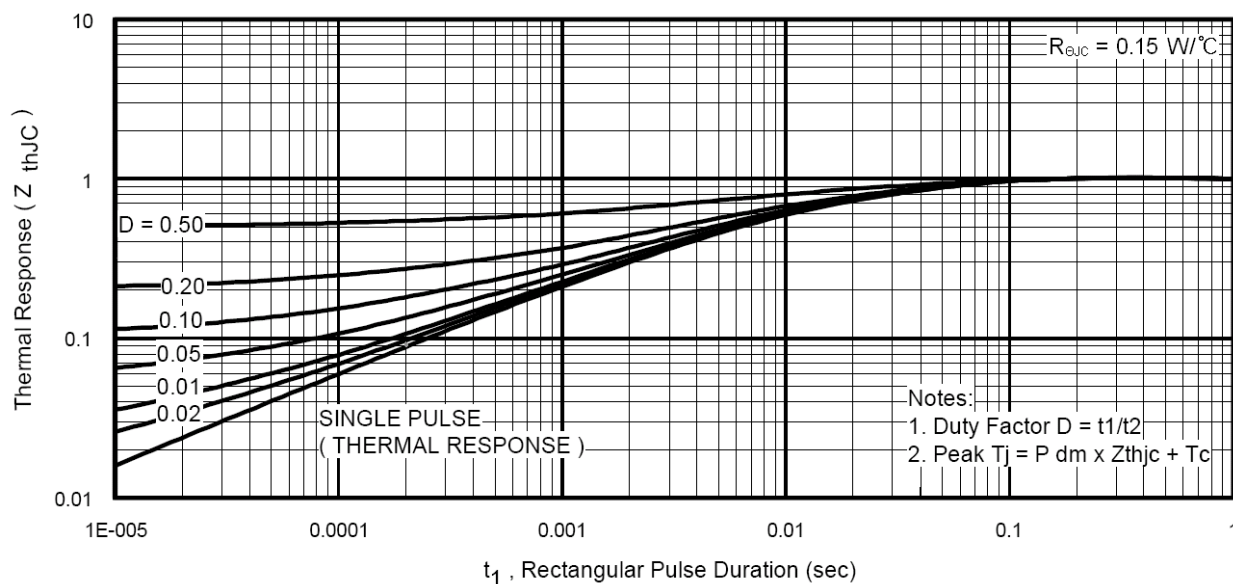


Fig 13. Normalized Transient Thermal Impedance, Junction-to-Case (IGBT)

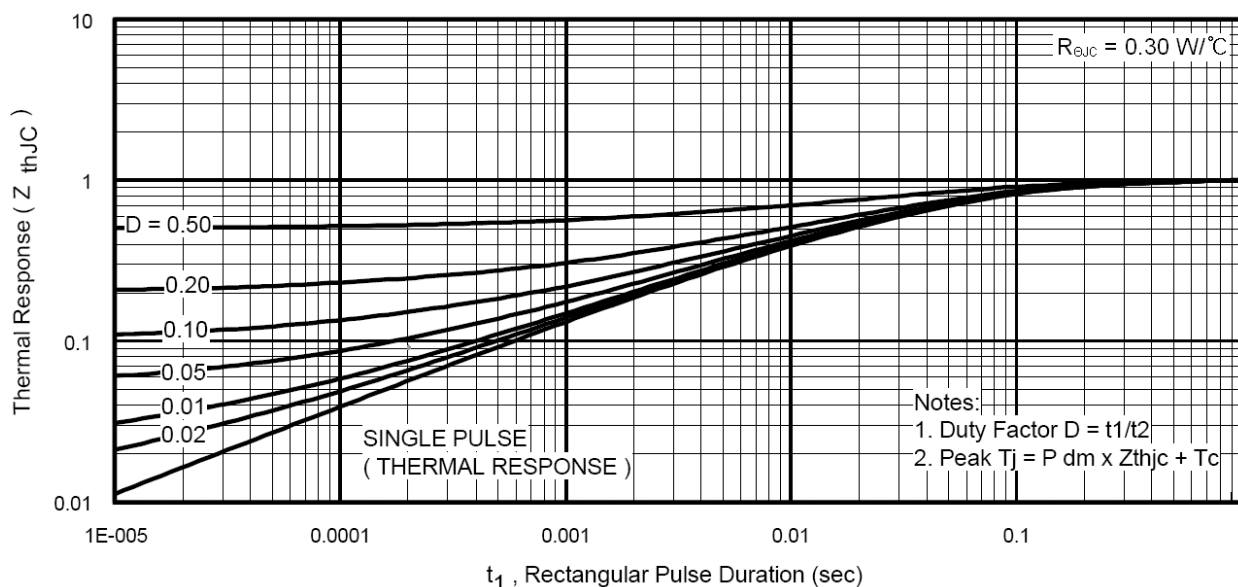
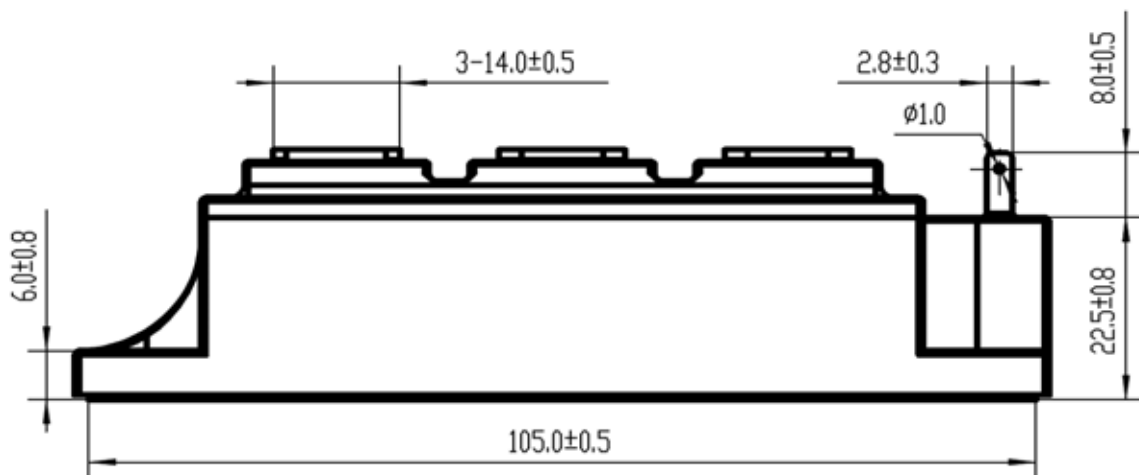
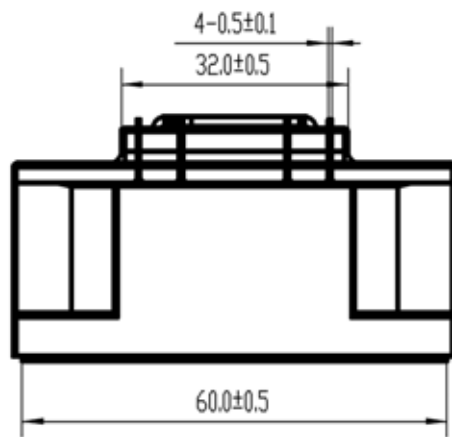
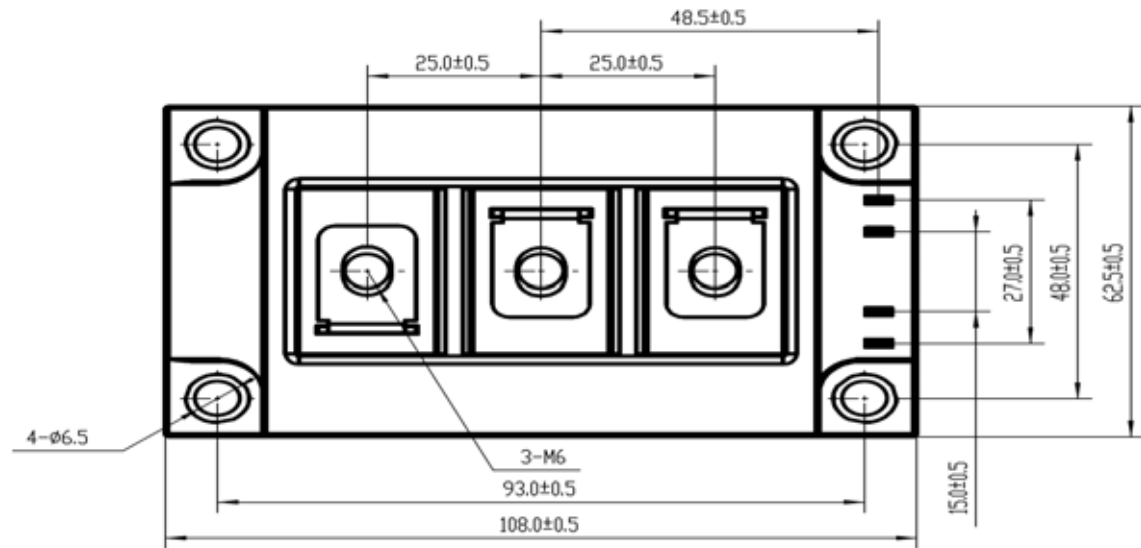


Fig 14. Normalized Transient Thermal Impedance, Junction-to-Case (DIODE)

Package Outline (dimensions in mm)



June 2008

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