

“HALF-BRIDGE” IGBT MODULE

Features

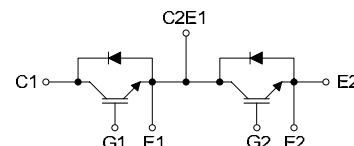
- Smarted NPT Technology Design
- 10μs Short circuit capability
- Low turn-off losses
- Short tail current for over 18KHZ
- Positive VCE(on) temperature coefficient

Applications

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



Package : V1



V_{CES} = 1200V
I_c = 75A
V_{CE(ON)} typ. = 2.6V
@ I_c = 75A

Absolute Maximum Ratings @ T_c = 25°C (per leg)

Symbol	Parameter	Condition	Ratings	Unit
V _{CES}	Collector-to-Emitter Voltage	V _{GE} = 0V, I _c = 500μA	1200	V
V _{GES}	Gate emitter voltage		± 20	V
I _c	Continuous Collector Current	T _c = 80°C	75	A
I _{CM}	Pulsed collector current	T _c = 80°C	150	A
I _F	Diode Continuous Forward Current	T _c = 80°C	75	A
I _{FM}	Diode Maximum Forward Current		150	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	°C
T _{stg}	Storage Temperature		-40 ~ 125	°C
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°C (unless otherwise specified)

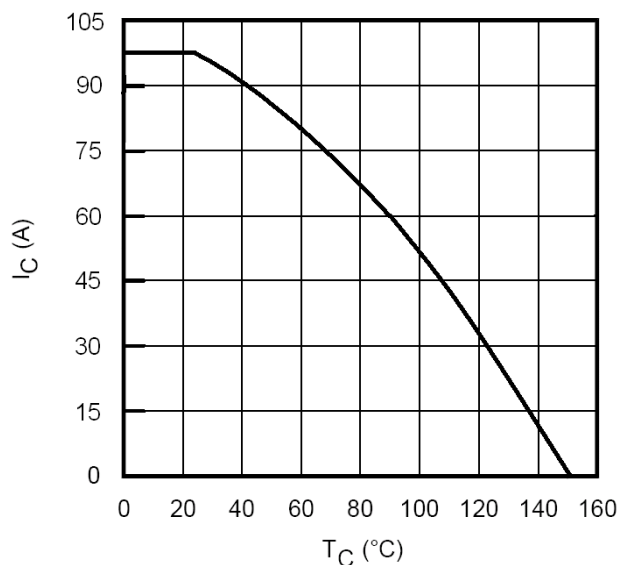
Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
V _{(BR)CES}	Collector-to-Emitter Breakdown Voltage	1200	-	-	V	V _{GE} = 0V, I _c = 500μA
V _{CE(ON)}	Collector-to-Emitter Saturation Voltage	-	2.6	2.8		I _c = 75A, V _{GE} = 15V
V _{GE(th)}	Gate Threshold Voltage	-	5.0	6.0		V _{CE} = V _{GE} , I _c = 500μA
I _{CES}	Zero Gate Voltage Collector Current	-	-	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	-	2.1	2.4	V	I _c = 75A

Switching Characteristic @ $T_j = 25^\circ\text{C}$ (unless otherwise specified)

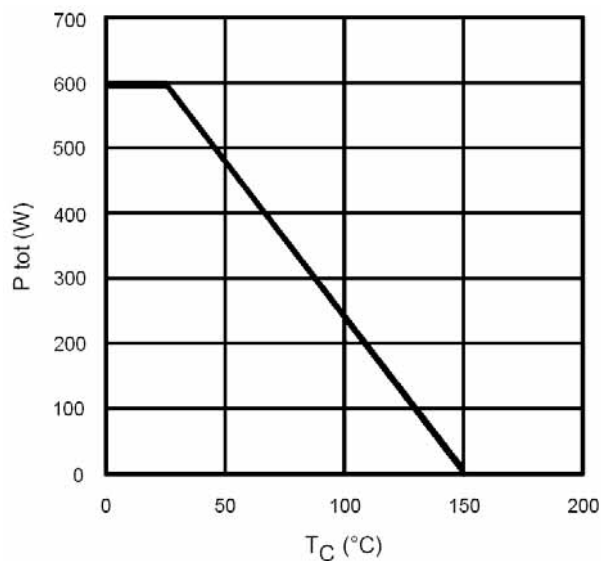
Symbol	Parameters	Min	Typ	Max	Unit	Test conditions
C_{ies}	Input capacitance	-	4100	-	pF	$V_{CC} = 30V, V_{GE} = 0V$
C_{oss}	Output capacitance	-	395	-		
C_{res}	Reverse transfer capacitance	-	160	-		
$t_{d(on)}$	Turn-on delay time	-	72	-	ns	$T_j = 125^\circ\text{C}, V_{CC} = 600V$ $I_C = 75A, V_{GE} = 15V$ $R_G = 4.7\Omega$
t_r	Rise time	-	32	-		
$t_{d(off)}$	Turn-off delay time	-	366	-		
t_f	Fall time	-	46	-		
I_{rr}	Diode Peak Reverse Recovery current	-	55	-	A	$T_j = 125^\circ\text{C}, V_{CC} = 600V$ $I_F = 75A, V_{GE} = 15V$ $R_G = 4.7\Omega, di/dt = 1200A/\mu s$
t_{rr}	Diode Reverse Recovery time	-	180	-	ns	

Thermal Characteristic Values

Symbol	Parameters	Min	Typ	Max	Unit
$R_{\theta JC}$	Junction-to-Case (IGBT Part, Per 1/2 Module)	-	-	0.26	$^\circ\text{C/W}$
$R_{\theta JC}$	Junction-to-Case (Diode Part, Per 1/2 Module)	-	-	0.54	
$R_{\theta CS}$	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**

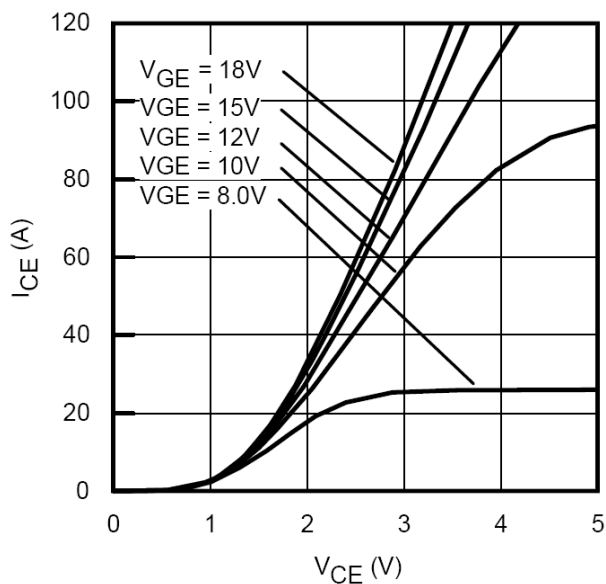


Fig 3. Typ. IGBT Output Characteristics
 $T_J = 25^\circ\text{C}; t_p = 80\mu\text{s}$

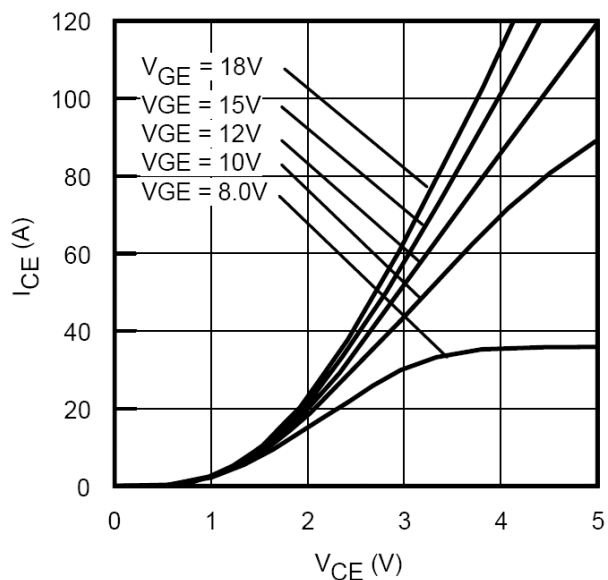


Fig 4. Typ. IGBT Output Characteristics
 $T_J = 125^\circ\text{C}; t_p = 80\mu\text{s}$

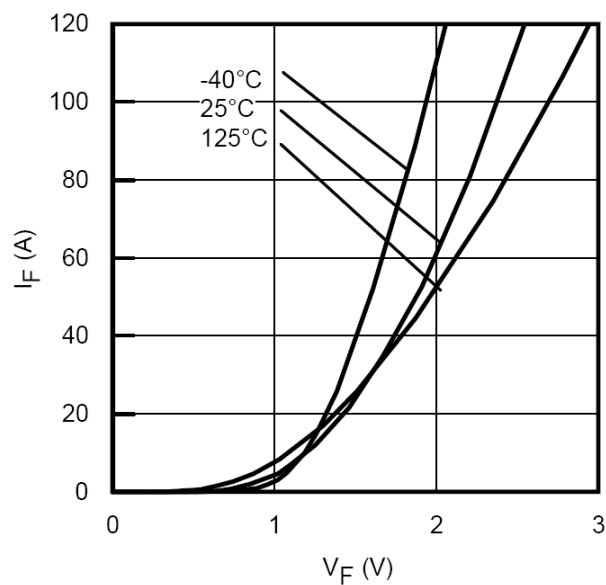


Fig 5. Typ. Diode Forward Characteristics

$t_p = 80\mu s$

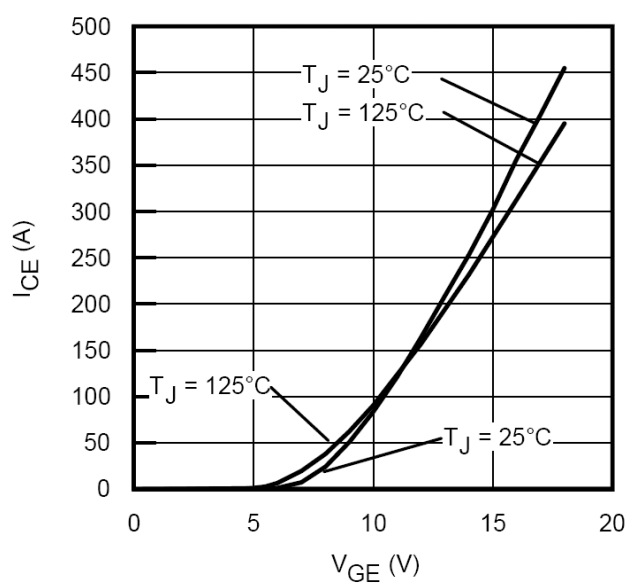


Fig 6. Typ. Transfer Characteristics

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

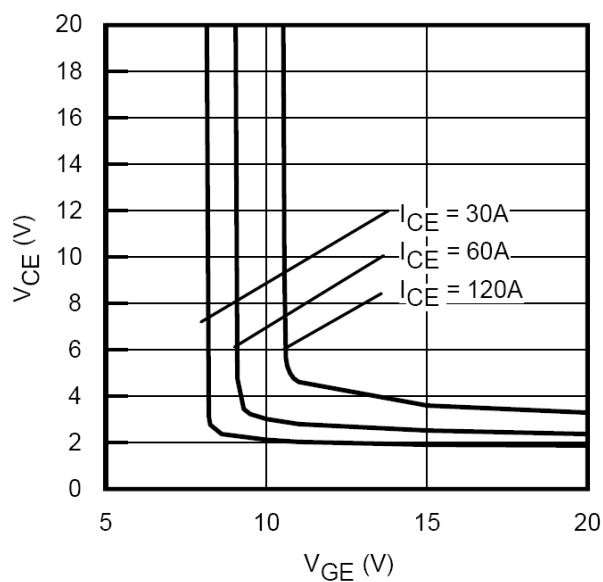


Fig 7. Typical V_{CE} vs. V_{GE}

$T_J = 25^\circ C$

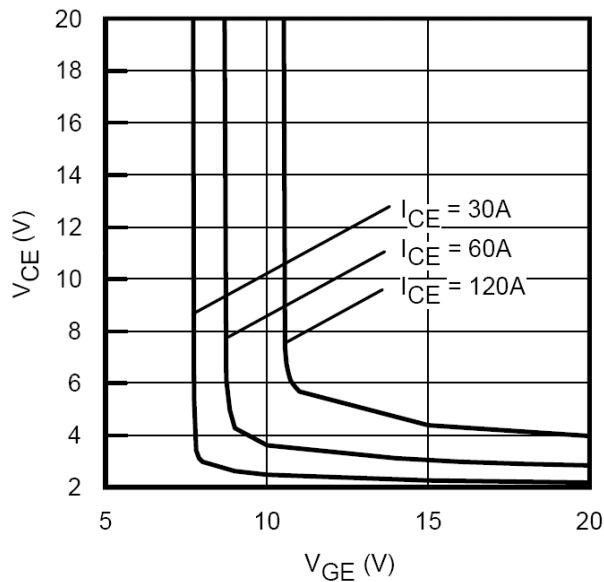


Fig 8. Typical V_{CE} vs. V_{GE}

$T_J = 125^\circ C$

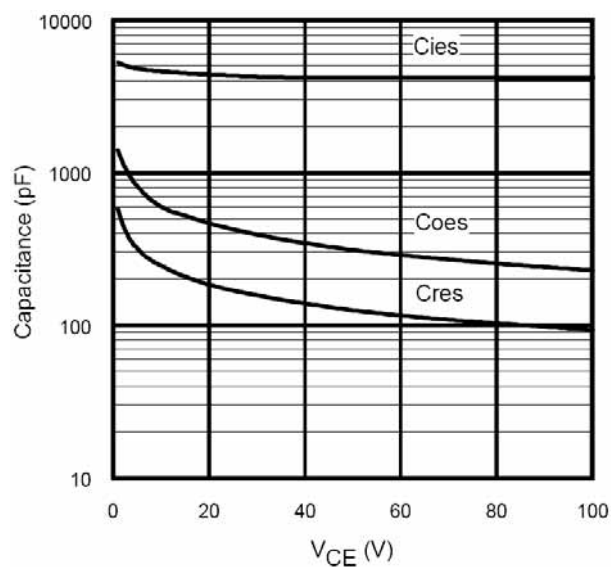


Fig 9. Typ. Capacitance vs. Vce

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

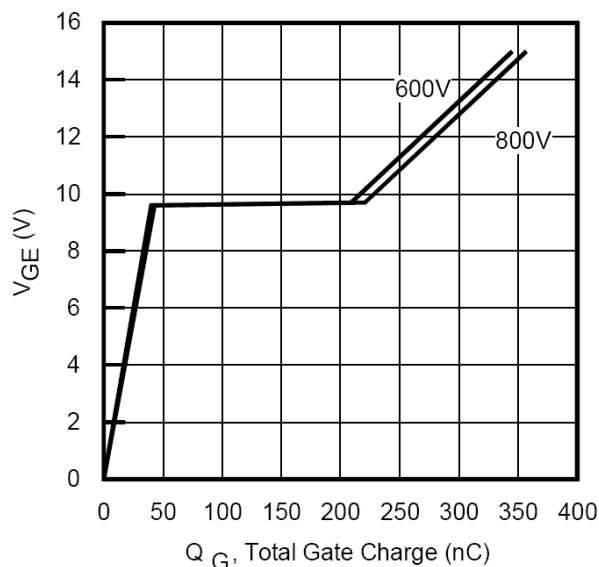


Fig 10. Typical Gate Charge vs. Vge

$I_{CE} = 60A$; $L = 600\mu H$

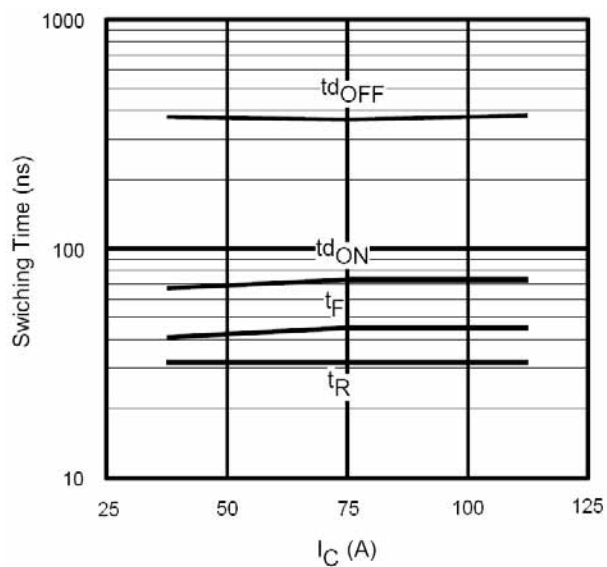


Fig 11. Typ. Switching Time vs. Ic

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

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

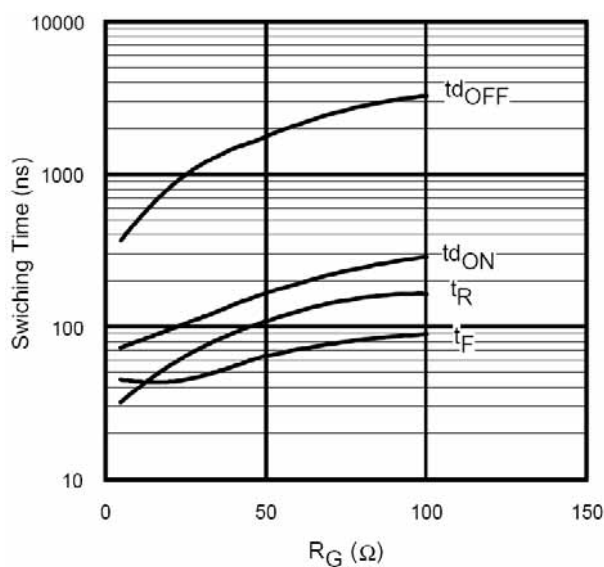


Fig 12. Typ. Switching Time vs. Rg

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

$I_{CE} = 75A$; $V_{GE} = 15V$

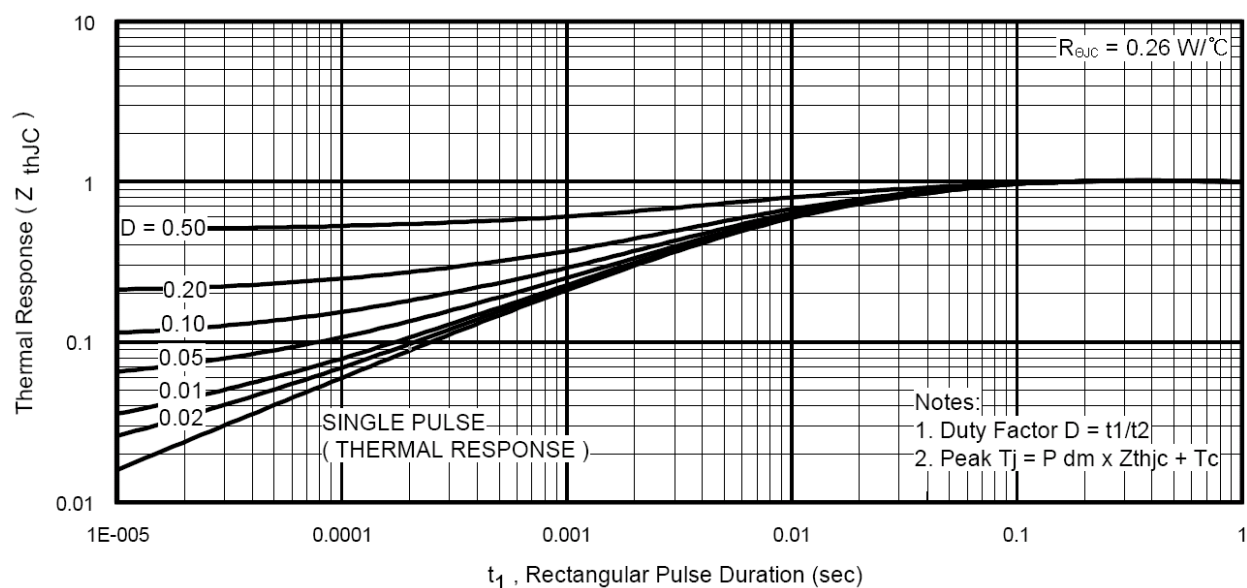


Fig 13. Normalized Transient Thermal Impedance, Junction-to-Case (IGBT)

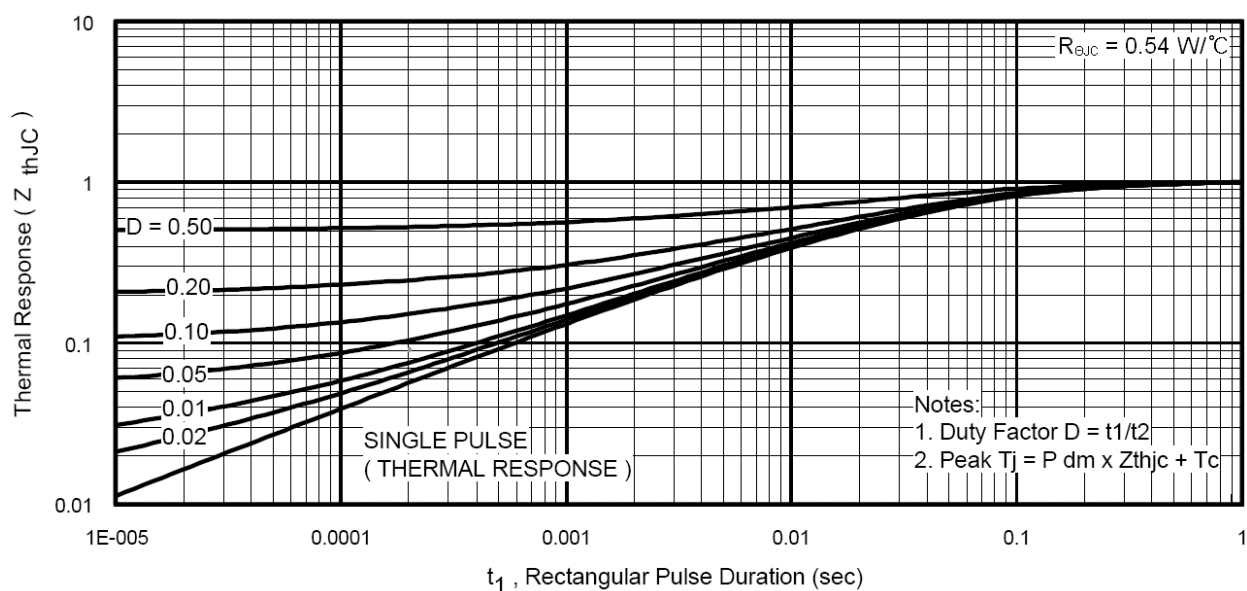
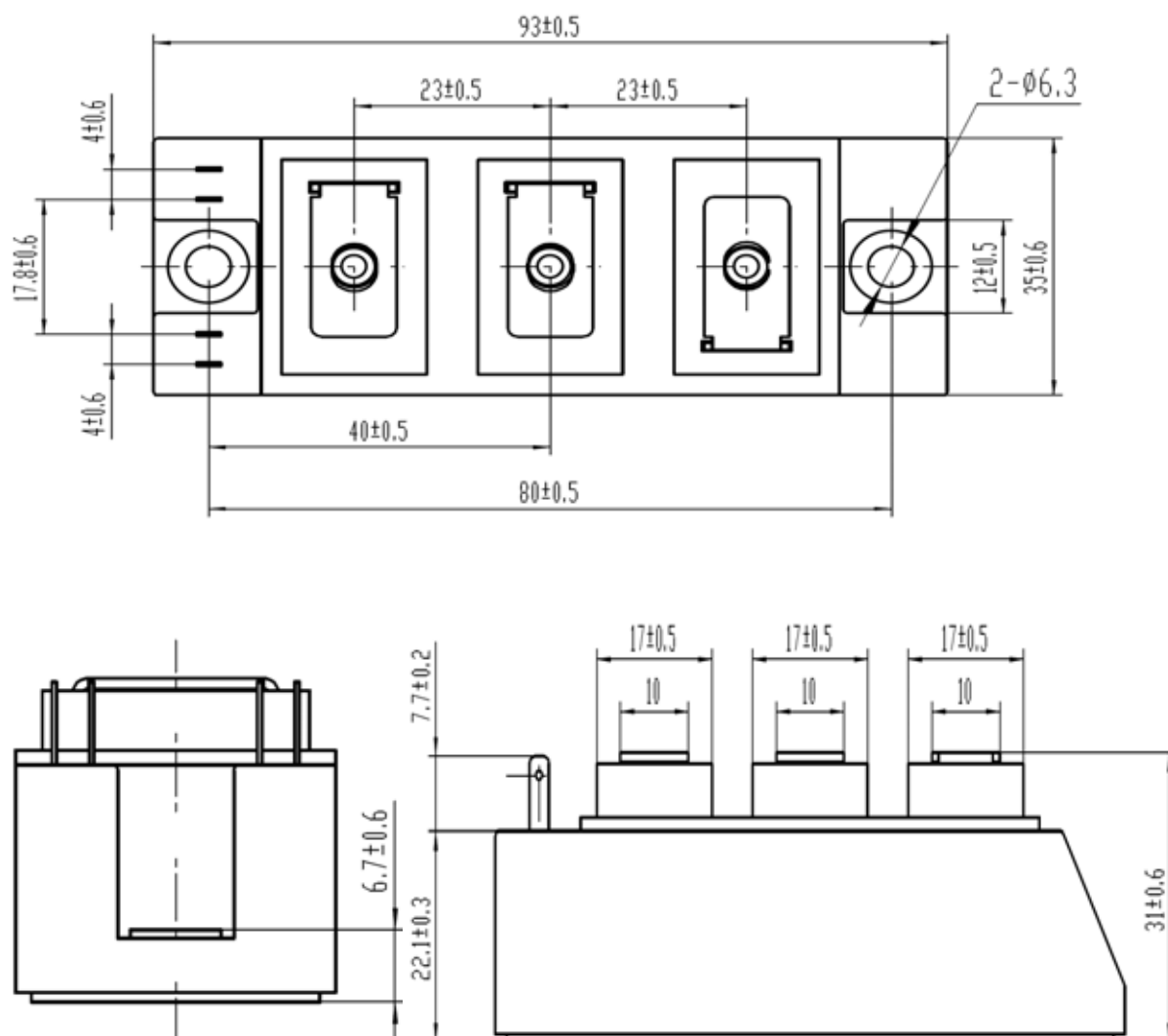


Fig 14. Normalized Transient Thermal Impedance, Junction-to-Case (DIODE)

Package Outline (dimensions in mm)



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