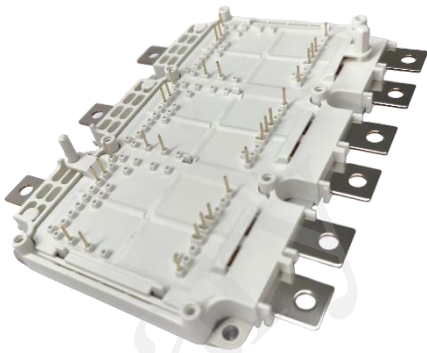


SiC Six-pack Module PAAC07750CM

Features

- Silicon Carbide MOSFET
- Low R_{DSon}
- Low Switching Losses
- Si_3N_4 Ceramic
- PinFin Base Plate
- Sliver Sintering Technology
- Die Top System Technology

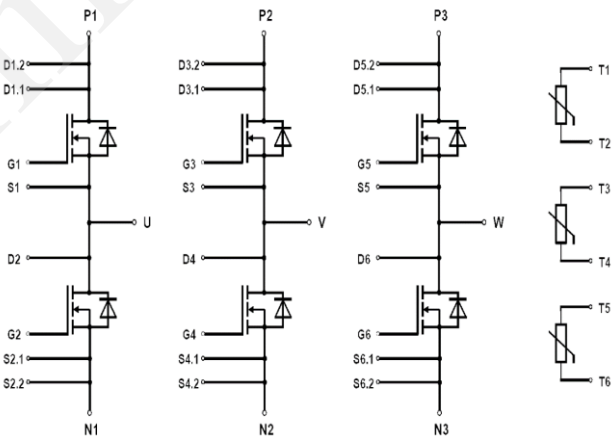


Applications

- Automotive Applications
- EV/HEV
- Motor Drives

Standards Benefits

- Improve System Efficiency
- Increase Power Density
- Reduce Heat Sink Requirement
- Reduce System Cost



Order Information

Part Number	Package	Marking
PAAC07750CM	HPD	PAAC07750CM

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1. Maximum Ratings

At $T_J = 25^\circ\text{C}$, unless specified otherwise

Parameter	Symbol	Value	Unit	Test Conditions
Drain - Source Voltage	V_{DS}	750	V	
Gate - Source Voltage (Dynamic)	V_{GSmax}	-8 / +21	V	AC (f > 1Hz)
Gate - Source Voltage(static) turn-on gate voltage turn-off gate voltage	$V_{GS,on}$ $V_{GS,off}$	+15/18 -3	V	Static
Continuous Drain Current	I_D	750	A	$V_{GS} = 18\text{V}$ $T_F = 25^\circ\text{C}$
Power Dissipation	P_D	1650	W	$T_F = 25^\circ\text{C}$
Operating Junction Temperature	T_J	-55 To +175	$^\circ\text{C}$	

2. Electrical Characteristics

At $T_J = 25^\circ\text{C}$, unless specified otherwise (Per Position)

Parameter	Symbol	Value			Unit	Test Conditions
		Min.	Typ.	Max.		
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	750	/	/	V	$V_{GS} = 0V$ $I_D = 8mA$
Gate Threshold Voltage	$V_{GS(th)}$	1.8	2.5	/	V	$V_{DS} = V_{GS}$ $I_D = 141.6mA$ $T_J = 25^\circ\text{C}$
Reverse Bias Drain Current	I_{DSS}	/	10	300	μA	$V_{GS} = 0V$ $V_{DS} = 750V$
Reverse Bias Drain Current	I_{DSS}	/	1	100	μA	$V_{GS} = -3V$ $V_{DS} = 750V$
Gate-Source Leakage Current	I_{GSS}	/	1	100	nA	$V_{GS} = 18V$ $V_{DS} = 0V$
Drain-Source On-State Resistance	$R_{DS(on)}$	/	1.5	/	m Ω	$V_{GS} = 18V$ $I_D = 750A$ $T_J = 25^\circ\text{C}$
		/	1.9	/		$V_{GS} = 18V$ $I_D = 750A$ $T_J = 125^\circ\text{C}$
		/	2.3	/		$V_{GS} = 18V$ $I_D = 750A$ $T_J = 175^\circ\text{C}$
Internal Gate Resistance	$R_{G(int)}$	/	1.7	/	Ω	$f = 1MHz$ $V_{AC} = 25mV$
Input Capacitance	C_{iss}	/	50	/	nF	$V_{GS} = 0V$ $V_{DS} = 600V$
Output Capacitance	C_{oss}	/	1.7	/	nF	$f = 100kHz$ $V_{AC} = 25mV$

Parameter	Symbol	Value			Unit	Test Conditions
		Min.	Typ.	Max.		
Reverse Transfer Capacitance	C _{rss}	/	99	/	pF	V _{DS} = 600V I _{DS} = 750A V _{GS} = -3 to 18V
Gate to Source Charge	Q _{gs}	/	684	/	nC	
Gate to Drain Charge	Q _{gd}	/	298	/		
Total Gate Charge	Q _g	/	1576	/		
Coss Stored Energy	E _{oss}	/	675	/	μJ	V _{DS} = 600V f= 100kHz
Thermal Resistance from Junction to Cooling Fluid	R _{θJF}	/	0.09	/	°C/W	per MOSFET, ΔV/Δt= 10.0dm³/min; T _F = 60°C

3. Reverse Diode Characteristics

At $T_J = 25^\circ\text{C}$, unless specified otherwise (Per Position)

Parameter	Symbol	Value		Unit	Test Conditions
		Typ.	Max.		
Diode Forward Voltage	V_{SD}	5.8	/	V	$V_{GS} = -3\text{V}$ $I_{SD} = 400\text{A}$ $T_J = 25^\circ\text{C}$
		5.2	/	V	$V_{GS} = -3\text{V}$ $I_{SD} = 400\text{A}$ $T_J = 175^\circ\text{C}$

4. NTC Thermistor Characteristics

Parameter	Symbol	Value			Unit	Test Conditions
		Min.	Typ.	Max.		
Rated Resistance	R_{NTC}	/	5	/	k Ω	$T_{NTC} = 25^{\circ}\text{C}$
Resistance Tolerance	$\Delta R/R$	-5	/	5	%	$T_{NTC} = 25^{\circ}\text{C}$
B-value	$B_{25/50}$	/	3380	/	K	$T_2 = 50^{\circ}\text{C}$
B-value	$B_{25/85}$	/	3435	/	K	$T_2 = 80^{\circ}\text{C}$
B-value	$B_{25/100}$	/	3485	/	K	$T_2 = 100^{\circ}\text{C}$
Power Dissipation	P_{NTC}	/	/	10	mW	$T_{NTC} = 25^{\circ}\text{C}$

5. Typical Performance

At $T_J = 25^\circ\text{C}$, unless specified otherwise (Per Position)

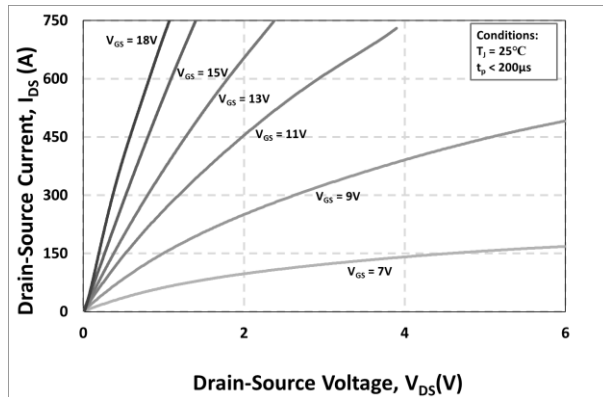


Figure 1. Output Characteristics $T_J = 25^\circ\text{C}$

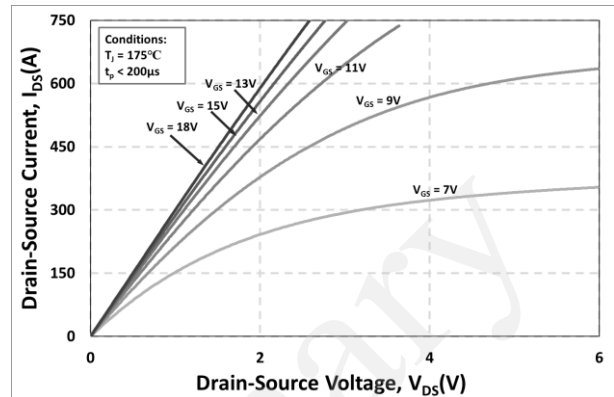


Figure 2. Output Characteristics $T_J = 175^\circ\text{C}$

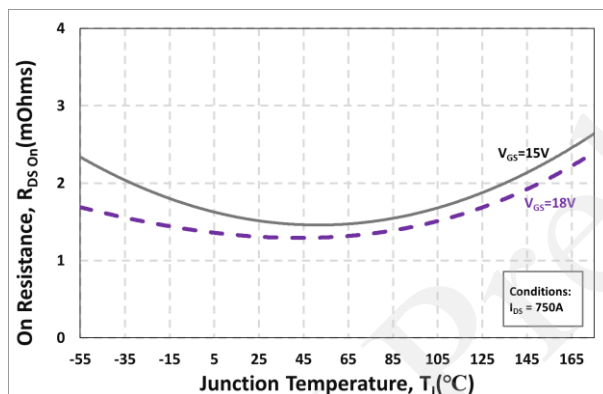


Figure 3. On-State Resistance vs. Junction Temperature

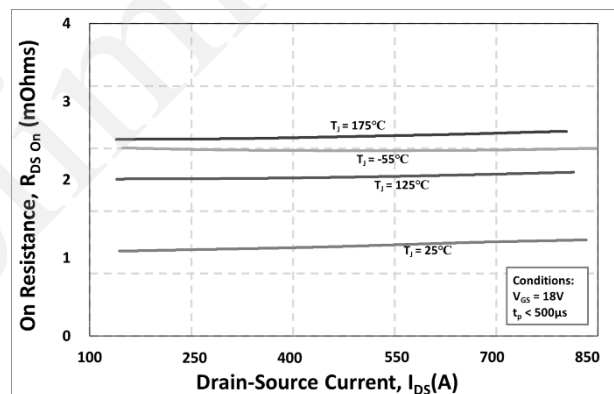


Figure 4. On-Resistance vs. Drain Current Various Temperatures

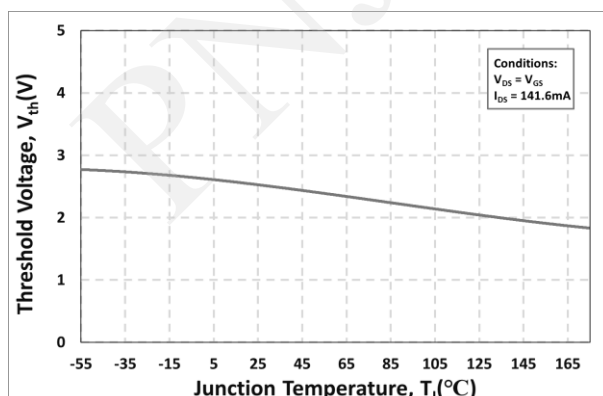


Figure 5. Threshold Voltage vs. Junction Temperature

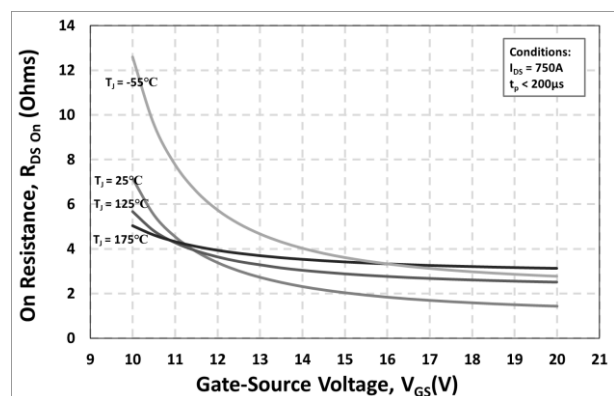


Figure 6. On-Resistance vs. Gate-Source Voltage

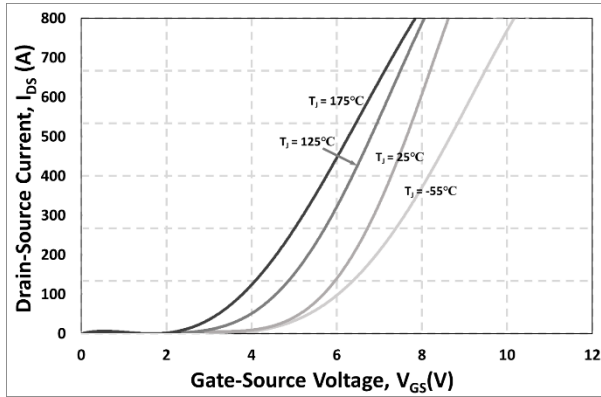


Figure 7. Transfer Characteristic for Various Junction Temperatures

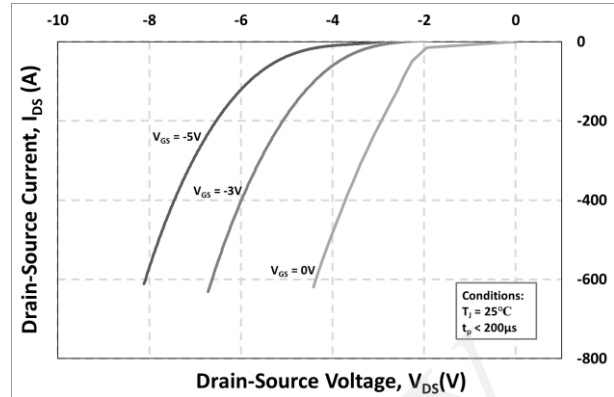


Figure 8. Body Diode Characteristic at 25°C

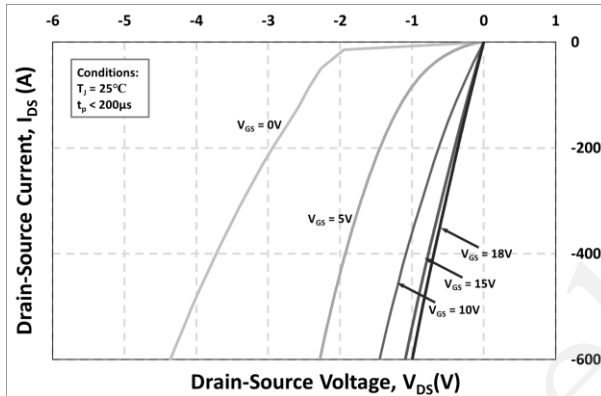


Figure 9. 3rd Quadrant Characteristic at 25°C

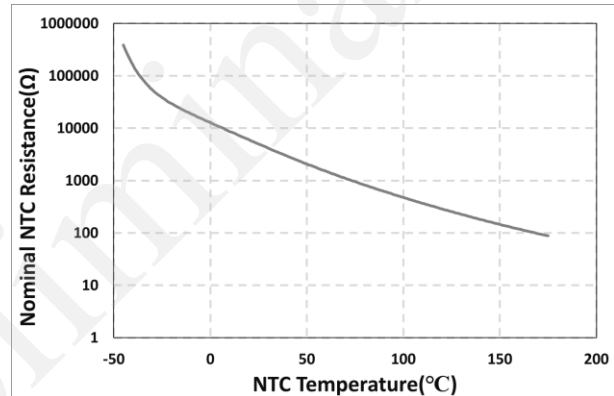


Figure 10. Nominal NTC Resistance vs. NTC Temperature

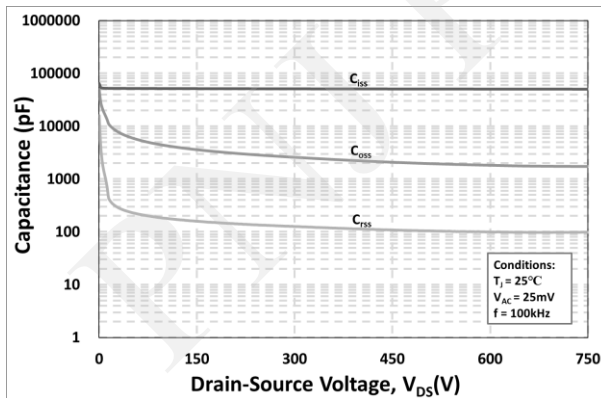


Figure 11. Capacitances vs. Drain-Source Voltage (0 - 750V)

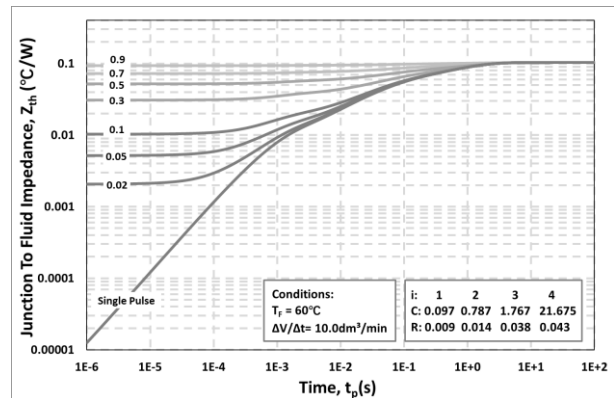
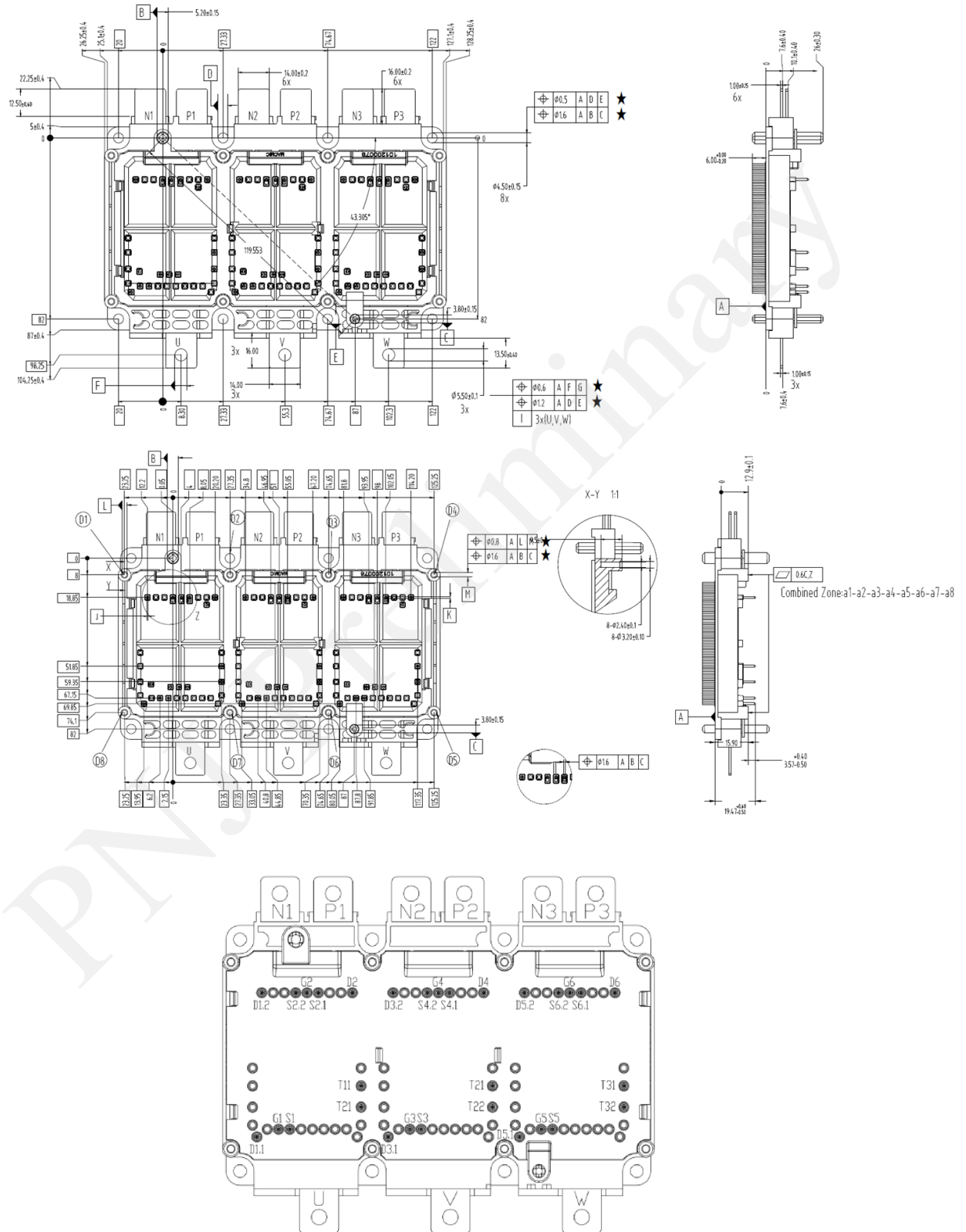


Figure 12. Transient Thermal Impedance (Junction – Cooling Fluid)

6. Package Outlines



Drawing and Dimensions

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