S1P10R120HBA Preliminary

1200V / 100A All-Silicon Carbide MOSFET Half-Bridge Module

Features

Electrical features
V_{DSS} = 1200V
I_D nom = 100A
High-speed Switching Possible
High Power Density
High Frequency Operation
Ultra-low Losses

Applications

Servo drives
UPS system
Motor drives

1 Maximum ratings

Table 1 **Maximum rating** (Tc = 25°C unless otherwise specified)

Symbol	Parameter	Value	Unit	Test Conditions	Note
$V_{DS,max}$	Drain source voltage	1200	V	V_{GS} = 0V, I_D = 100 µA	
$V_{GS,max}$	Gate source voltage	-8 /+19	V	Absolute maximum values	

V_{GSop}

3 Electrical characteristics

Table 4 SiC MOSFET characteristics (Tc = 25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
$V_{(BR)DSS}$	Drain-source breakdown voltage	1200	-	-	V	V_{GS} = 0V, I_D = 200µA	
$V_{GS(th)}$	Gate threshold voltage	2.3	2.8	4.0	V	V_{DS} = V_{GS}, I_D = 35.4mA	
		-	2.0	-	V	V_{DS} = V_{GS}, I_D =	

Table 5 Body diode characteristics (Tc = 25°C unless otherwise specified)

Symbol	Parameter	Min.	Typ.	Max.	Unit	Test Conditions	Note
V_{SD}	Diode forward voltage	-	4.0	-	V	V_{GS} = -4V, I_{SD} = 100A	
		-	3.5	-	V	V_{GS} = -4V, I_{SD} = 100A T_J = 175°C	
I_S	Continuous diode						

4 Electrical characteristic diagram

Figure 1. Output Characteristic, T_{vj}=25

Figure 2. Output Characteristic, T_{vj}=175

Figure 3. Transfer Characteristic

Figure 4. On-resistance VS. Junction Temperature

Figure 5. On-resistance VS. Drain to Source Current

Figure 6. Capacitance VS. V_{DS}

Figure 7. 3rd Quadrant Characteristic

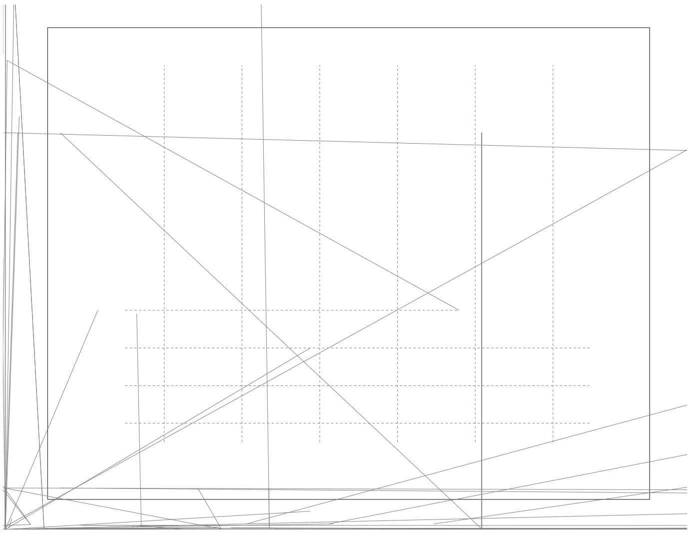


Figure 8. MOSFET Switching Energy vs. External Gate Resistance

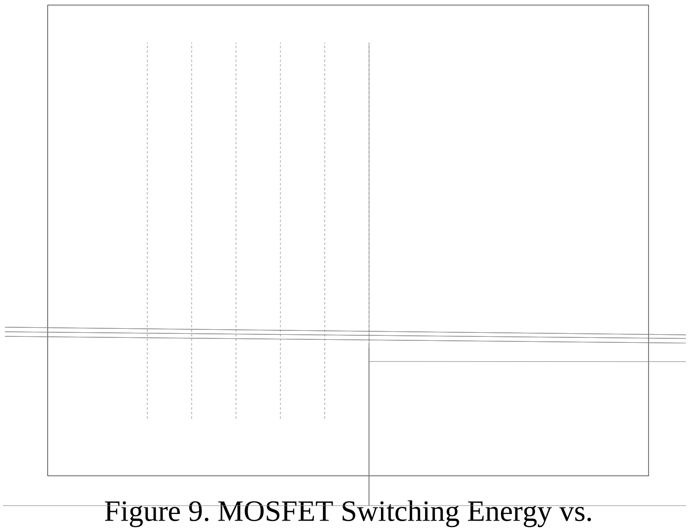


Figure 9. MOSFET Switching Energy vs. Drain to Source Current

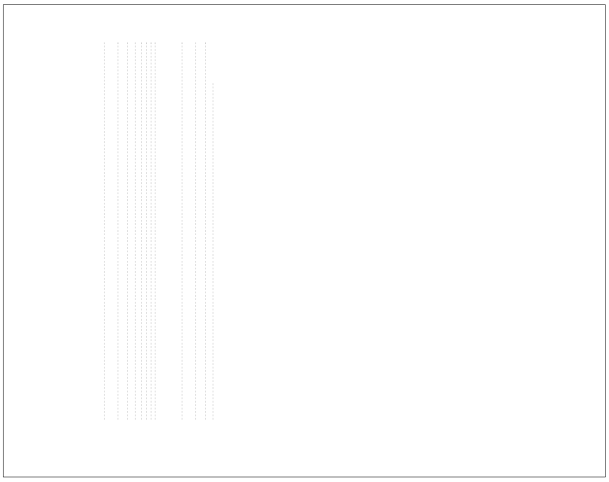
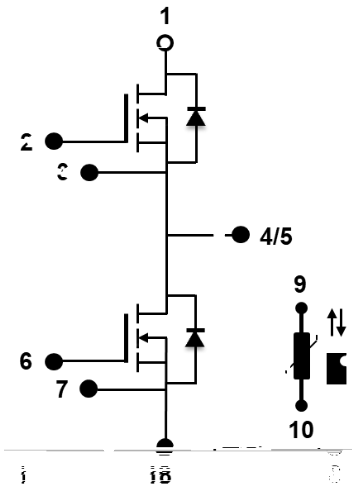
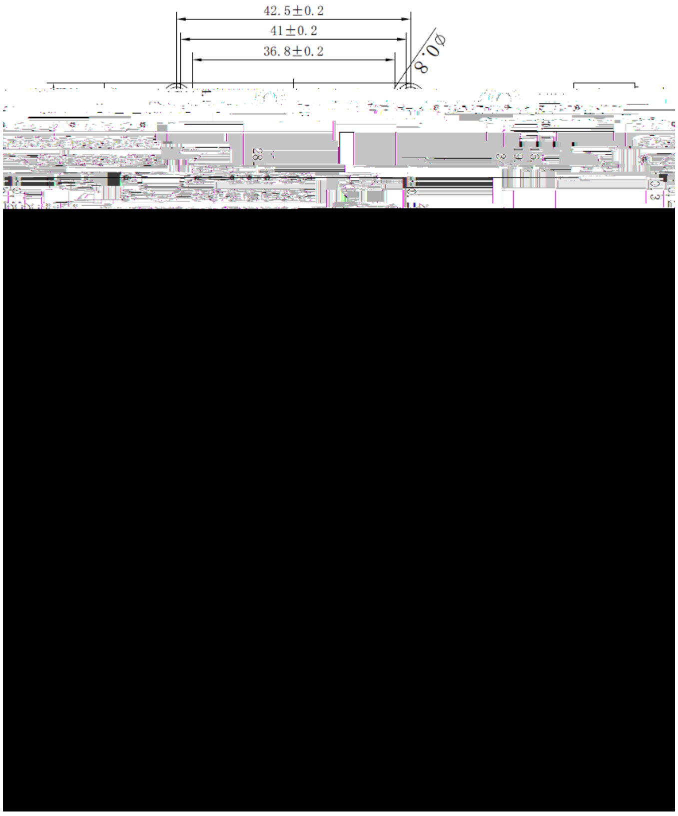


Figure 10. Transient Thermal Impedance (junction to case)

5 Package drawing





6 Test conditions

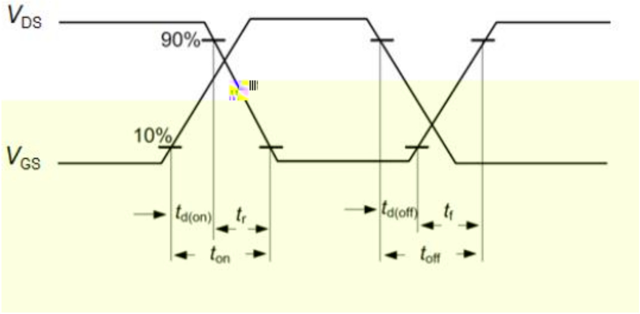


Figure A. Definition of switching times

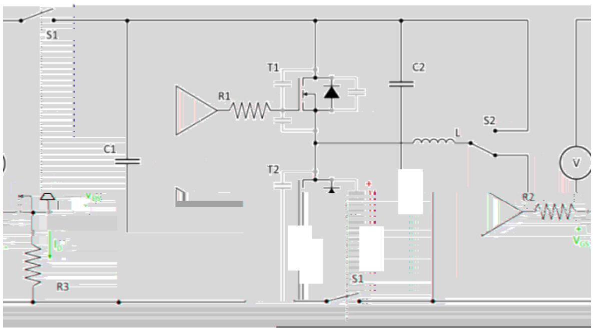


Figure B. Dynamic test circuit

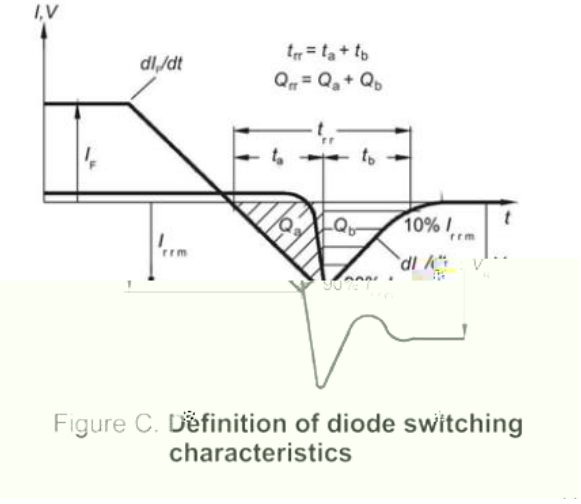


Figure C. Definition of body diode switching characteristics