Hybrid IGBT, 50 A, 650 V

AFGHL50T65SQDC

Using the novel field stop 4th generation IGBT technology and the 1.5th generation SiC Schottky Diode technology, AFGHL50T65SQDC offers the optimum performance with both low conduction and switching losses for high efficiency operations in various applications, especially totem pole bridgeless PFC and Inverter.

Features

- AEC−Q101 Qualified
- Maximum Junction Temperature : T_J = 175 C
- Positive Temperature Co−efficient for Easy Parallel Operating
- High Current Capability
- Low Saturation Voltage: $V_{CE(Sat)}$ = 1.6 V (Typ.) @I_C = 50 A
- Fast Switching
- Tighten Parameter Distribution
- No Reverse Recovery/No Forward Recovery

Typical Applications

- Automotive
- On & Off Board Chargers
- DC−DC Converters
- PFC
- Industrial Inverter

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector to Emitter Voltage	V_{CES}	650	V
Gate to Emitter Voltage Transient Gate to Emitter Voltage	V_{GES}	20 30	V
Collector Current @T_C = 25 C @T_C = 100 C	I_C	100 50	A
Pulsed Collector Current (Note 1)	I_{LM}	200	A
Pulsed Collector Current (Note 2)	I_{CM}	2000707 15.307 ref233.575 263.10 Tc(200)Tj 264.529 .9071001 Tw(Pulswardr Current)re68(	

THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Thermal resistance junction−to−case, for IGBT	$R_{\theta JC}$	0.63	C/W
Thermal resistance junction−to−case, for Diode	$R_{\theta JC}$	1.55	C/W
Thermal resistance junction−to−ambient	$R_{\theta JA}$	40	C/W

ELECTRICAL CHARACTERISTICS (T_J = 25 C unless otherwise noted)

Parameter	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS						
Collector−emitter breakdown voltage, gate−emitter short−circuited	V_{GE} = 0 V, I_C = 1 mA	BV_{CES}	650	−	−	V
Temperature Coefficient of Breakdown Voltage	V_{GE} = 0 V, I_C = 1 mA	$\frac{\Delta BV_{CES}}{\Delta T_J}$	−			

ELECTRICAL CHARACTERISTICS (T_J = 25 C unless otherwise noted)

Parameter	Unit

TYPICAL CHARACTERISTICS

Figure 1. Typical Output Characteristics (T_C = 25°C)

Figure 2. Typical Output Characteristics ¨ (T_C = 175°C)

TYPICAL CHARACTERISTICS (continued)

Figure 7. Saturation Voltage vs. V_{GE} (T_C = 175°C)

Figure 8. Capacitance Characteristics

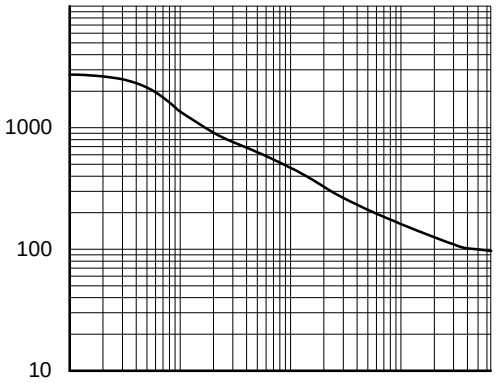
Figure 9. Gate Charge Characteristics (T_C = 25°C)

Figure 10. Turn−on Characteristics vs. Gate Resistance

Figure 11. Turn−Off Characteristics vs. Resistance

Figure 12. Turn

TYPICAL CHARACTERISTICS (continued)



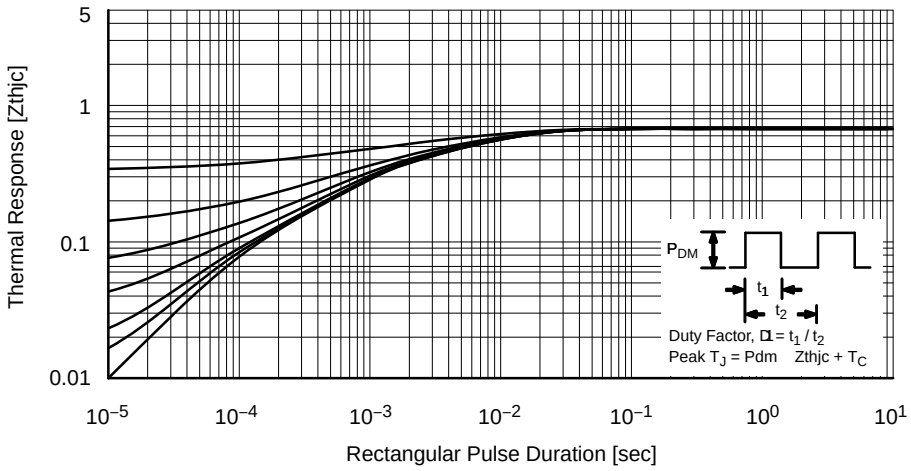


Figure 22. Transient Thermal Impedance of IGBT

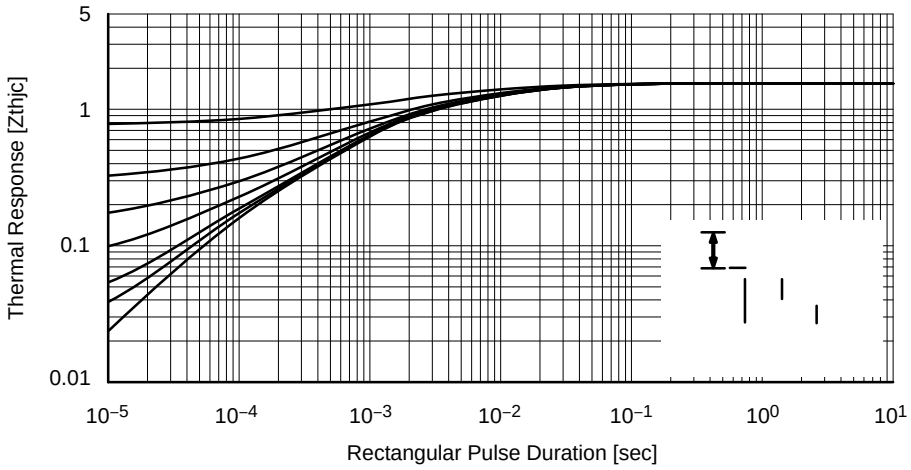
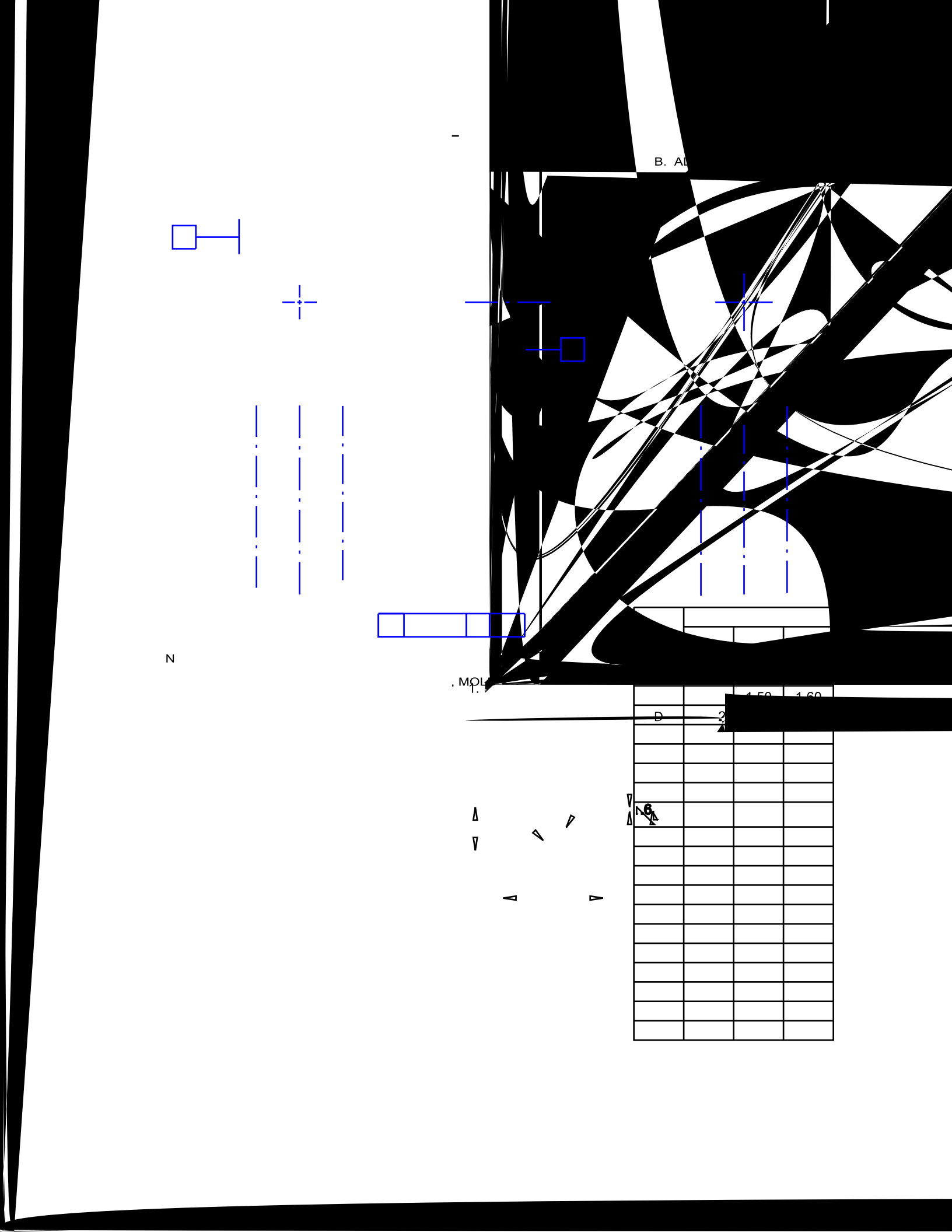


Figure 23. Transient Thermal Impedance of Diode


B. Al
N
1.50
1.60
D
3
6