昌德微电 THUNDER

THC65R090KH

RoHS SGS

650V Planar SiC Power MOSFET

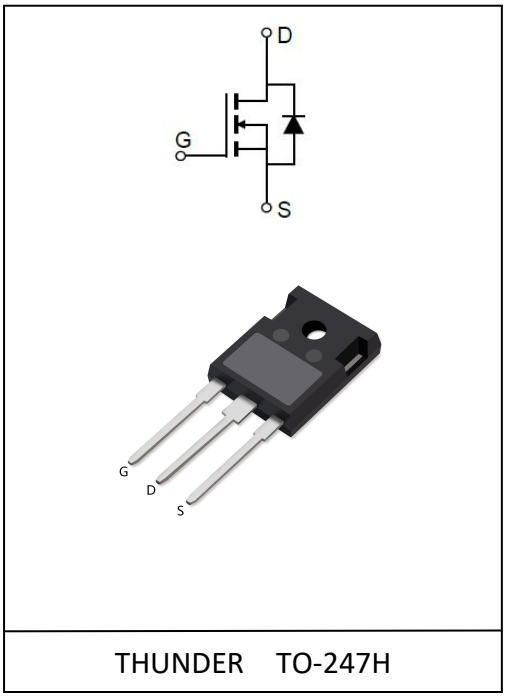
Parameter		Value	Unit
V_{DS}		650	V
$R_{DS(on)}$_typ.	V_{GS}=15V	90	mΩ
I_D		36	A

Features

- Wide Bandgap SiC MOSFET Technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery (Qrr)
- Robust against Parasitic Turn on Even 0V Turn off Gate Voltage

Benefits

- Reduced Switching Losses
- Increased System Switching Frequency
- Increased Power Density
- Reduction of Heat Sink Requirements
- Reduced EMI



THUNDER TO-247H

Application

- Switch Mode Power Supplies
- High Voltage DC/DC Converters
- Battery Chargers
- Motor Drives
- Pulsed Power Applications

Maximum ratings at T_j=25℃, Unless otherwise specified

Parameter	Symbol	Test Condition	Value	Unit
Drain to Source Voltage	V_{DS}	V_{GS}=0V,I_D=100uA	650	V
Gate to Source Voltage	V_{GS}	Absolute maximum values	-10/+22	V
Recommended Operation Voltage of Gate to Source	V_{GSOP}	Recommended operational values	0/+18	V
Continuous Drain Current	I_D	V_{GS}=15V,T_C=25℃	36	A
		V_{GS}=15V,T_C=100℃	27	
Pulsed Drain Current	I_{DM}	V_{GS}=15V,T_C=25℃	72	A

Power Dissipation	P_{tot}	T_C=25℃, T_j=175℃	136	W
Operating and Storage Temperature	Tj, Tstg		-55 to +175	℃

Thermal Characteristics

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Thermal Resistance from Junction to Case	$R_{th(j-c)}$	-	1.1	-	℃/W

Electrical Characteristics

Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=500uA	650			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS},I_D=7.5mA	2.7		4.5	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V,V_{DS}=650V,T_j=25℃			10	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=18V,V_{DS}=0V			250	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=15V,I_D=17A		90	120	mΩ
		V_{GS}=15V,I_D=17A,T_j=175℃		77		
		V_{GS}=18V,I_D=17A		63		
		V_{GS}=18V,I_D=17A,T_j=175℃		65		

Dynamic Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_{iss}	V_{GS}=0V,V_{DS}=500V, f=100KHz,T_j=25℃		1040		pF
Output Capacitance	C_{oss}			96		
Reverse Transfer Capacitance	C_{rss}			9		

Total Gate Charge	Q_g	V_{GS}=0/15V,V_{DS}=500V, I_D=17A,T_j=25℃		41		nC
Gate-Source Charge	Q_{gs}			10		
Gate-Drain Charge	Q_{gd}			16		
Gate Resistance	R_g	V_{AC}=25mV, f=100KHz		3.0		Ω

Switching Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=0/15V,V_{DD}=500V, I_D=17A,R_g=2Ω		19		nS
Rise Time	t_r			115		
Turn-Off Delay Time	$t_{d(off)}$			31		
Fall Time	t_f			34		

Reverse Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	V_{GS}=0V,I_{SD}=8.5A,T_j=25℃		3.5		V
Continuous Diode Forward Current	I_S	V_{GS}=0V,T_j=25℃		36		A
Reverse Recovery Time	t_{rr}	V_{GS}=0V,I_{SD}=17A, V_R=500V,di/dt=550A/us, T_j=25℃		17.8		nS
Reverse Recovery Charge	Q_{rr}			63		nC
Peak Reverse Recovery Current	I_{rrm}			4.9		A

Typical Performance

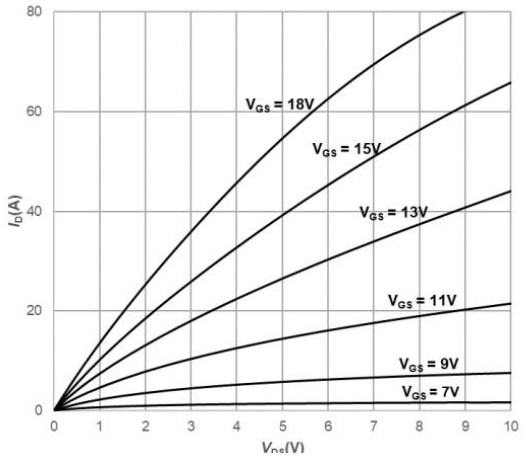


Fig1. Output Characteristics T_j=25℃

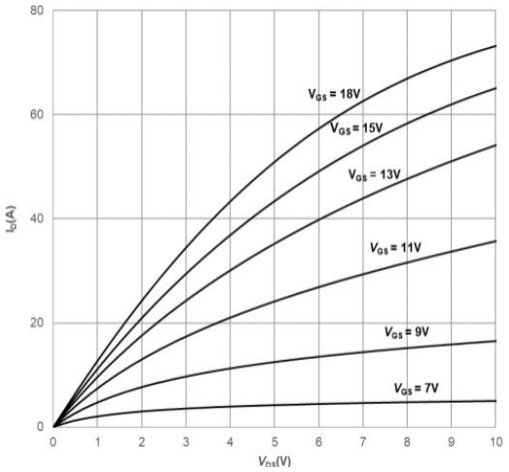
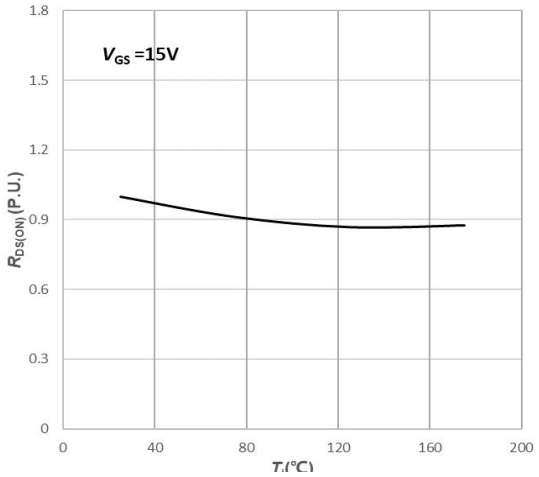


Fig2. Output Characteristics T_j=175℃



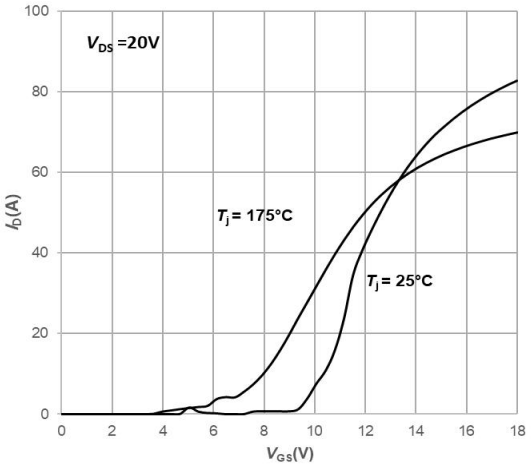
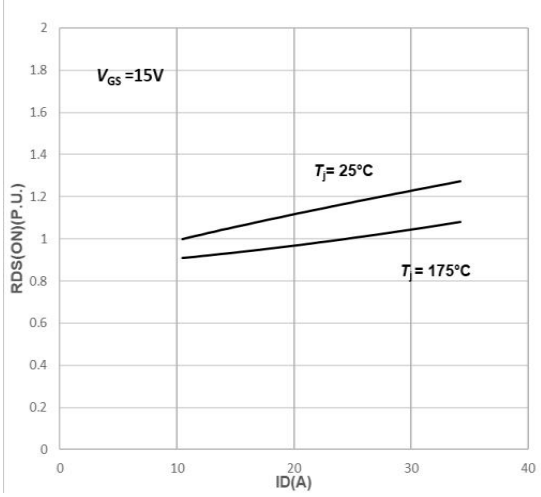


Fig4. Normalized On-Resistance vs. Temperature



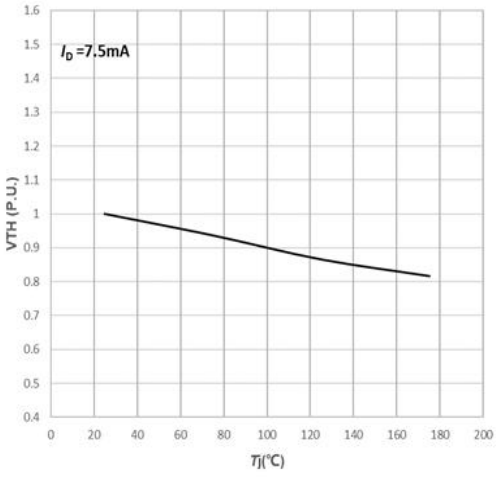


Fig5. Normalized On-Resistance vs. Drain Current For Various Temperatures

Fig6. Normalized Threshold Voltage vs. Temperature

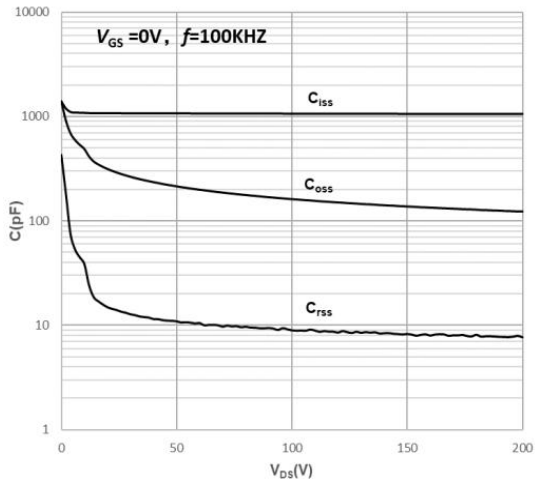


Fig7. Capacitances vs. Drain-Source Voltage (0-200V)

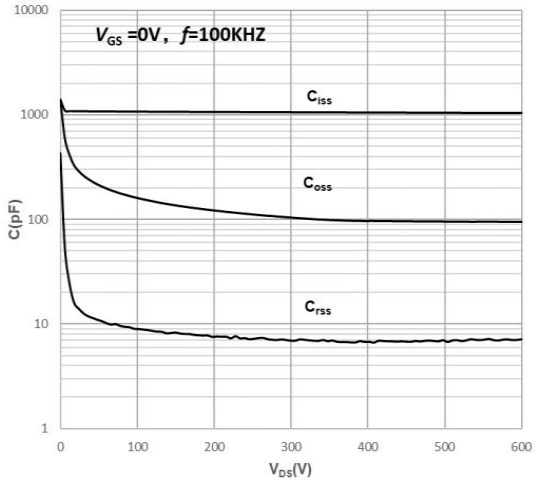


Fig8. Capacitances vs. Drain-Source Voltage (0-600V)

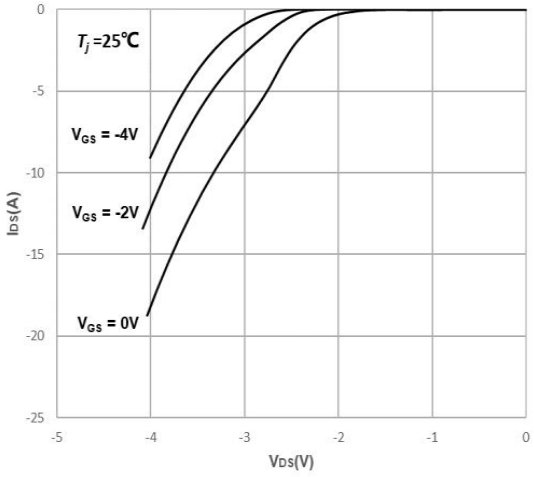
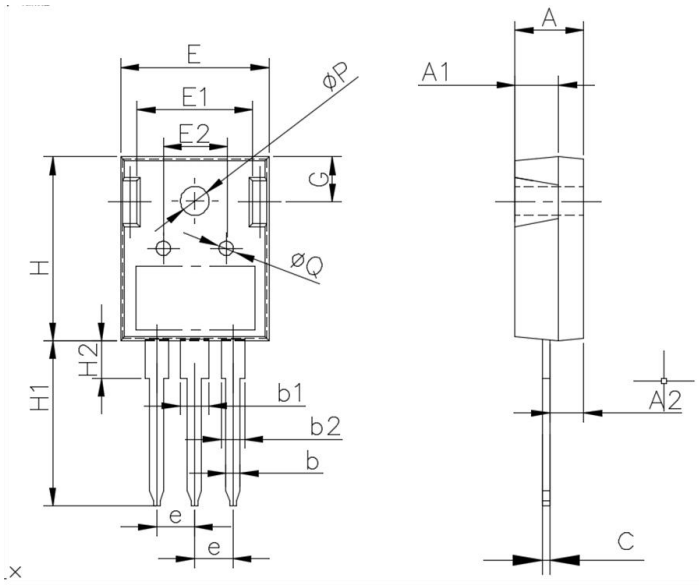


Fig9.Body Diode Characteristics

Package Information

TO-247H PACKAGE



基本尺寸

Symbol	单位 mm		
	Min	Nom	Max
A	4.80	5.00	5.20
A1	2.80	3.00	3.20
A2	2.20	2.40	2.60
b	1.05	1.20	1.35
b1	2.80	3.00	3.20
b2	1.80	2.00	2.20
c	0.50	0.60	0.70
e	5.35	5.45	5.75
E	15.6	15.80	16.0
E1	12.3	12.50	12.7
E2	6.00	6.20	6.40
H	20.8	21.0	21.2
H1	19.5	20.0	20.5
H2	3.70	4.00	4.30
G	5.70	5.90	6.10
ΦP	3.30	3.50	3.70
ΦQ	2.30	2.50	2.70

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