V_{DSS}	1200 V
I_D	36 A
$R_{DS(ON)}$	80 mΩ

FEATURES

- Wide Bandgap SiC MOSFET Technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery (Qrr)
- Easy to Parallel and Simple to Drive

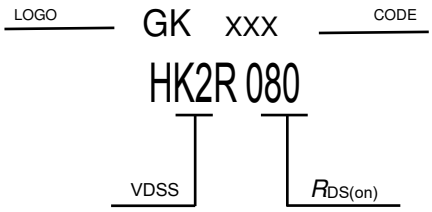
BENEFITS

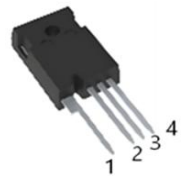
- Reduced Switching Losses
- Increased System Switching Frequency
- Increased Power Density
- Reduction of Heat Sink Requirements
- Reduced EMI

APPLICATION

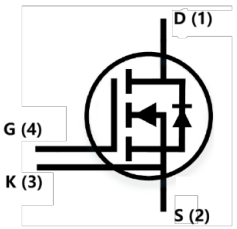
- Power Factor Correction Modules
- Switch Mode Power Supplies
- DC-AC Inverters
- High Voltage DC/DC Converters







TO-247-4L top view



ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

Parameter	Symbol	Test Condition	Value	Unit
Drain to Source Voltage	V_{DS}	V_{GS} = 0V, I_D = 100μA	1200	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	-4/+18	V
Continuous Drain Current	I_D	V_{GS}=18V, T_C=25℃	36	A
		V_{GS}=18V, T_C=100℃	25	
Pulsed Drain Current	I_{DM}	Pulse with T_p limited by T_{jmax}	80	A
Power Dissipation	P_{tot}	T_C=25℃, T_j=175℃	283	W
Operating and Storage Temperature	T_j, T_{stg}		-55 to +175	℃

ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

Static Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=500μA	1200			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}= V_{DS}, I_D=5mA, T_j=25℃	2		4	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS}=0V, V_{DS}=1200V			10	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS}=18V, V_{DS}=0V			100	nA
Drain to Source on Resistance	$R_{DS(on)}$	V_{GS}=18V, I_D=20A		80	104	mΩ
		V_{GS}=18V, I_D=20A, T_j=175℃		122		

Dynamic Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=800V, f=1MHz, T_j=25℃		944		pF
Output Capacitance	C_{oss}			42.6		
Reverse Transfer Capacitance	C_{rss}			4.1		
Total Gate Charge	Q_g	V_{GS}=-4/18V, V_{DS}=800V, I_D=20A, T_j=25℃		51		nC
Gate-Source Charge	Q_{gs}			13		
Gate-Drain Charge	Q_{gd}			25		
Gate Resistance	R_g	V_{AC}=25mV, f=1MHz		4		Ω

Thermal Characteristics

Parameter	Symbol	Value			Unit
		Min.	Typ.	Max.	
Thermal Resistance from Junction to Case	$R_{th(j-c)}$	-	0.529	-	℃/W

ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

Switching Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=-4/18V, V_{DD}=800V, I_D=20A, R_g=10Ω		38		ns
Rise Time	t_r			46		
Turn-Off Delay Time	$t_{d(off)}$			32		
Fall Time	t_f			41		
Turn-On Energy	E_{on}			108		μJ
Turn-Off Energy	E_{off}			49		

Reverse Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	V_{GS}=-4V, I_{SD}=10A, T_j=25℃	-	4.5		V
Continuous Diode Forward Current	I_S	V_{GS}=-4V, T_j=25℃		36		A
Reverse Recovery Time	t_{rr}	V_{GS} = -4V, I_{SD}=20A, V_R=800V, di/dt=800A/us, T_j=25℃		17.5		ns
Reverse Recovery Charge	Q_{rr}			71.4		nC
Peak Reverse Recovery Current	I_{rrm}			6.8		A

RATING AND CHARACTERISTIC CURVES

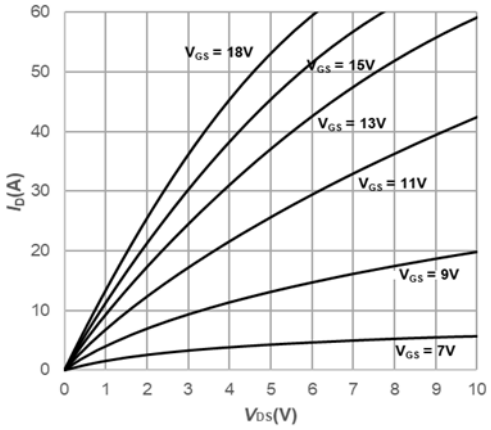


Fig1. Output Characteristics T_j=25℃

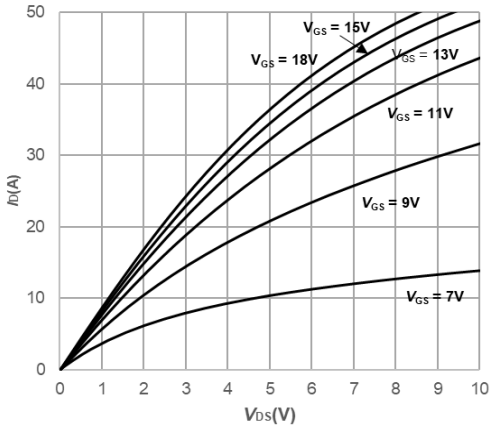


Fig2. Output Characteristics T_j=175℃

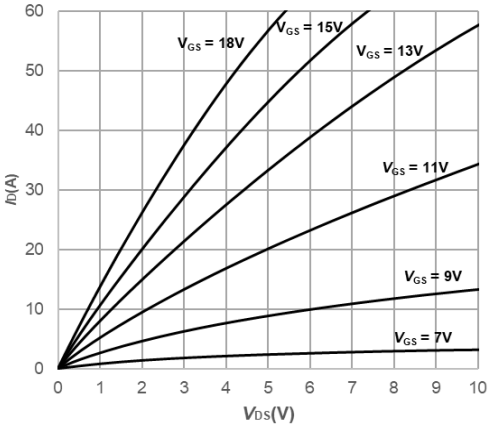


Fig3. Output Characteristics T_j=-55℃

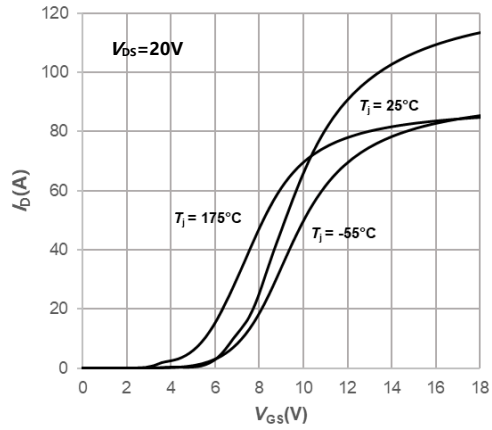


Fig4. Typical Transfer Characteristics

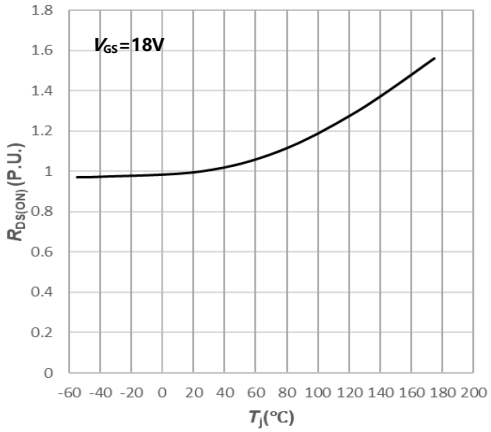


Fig5. Normalized On-Resistance vs. Temperature

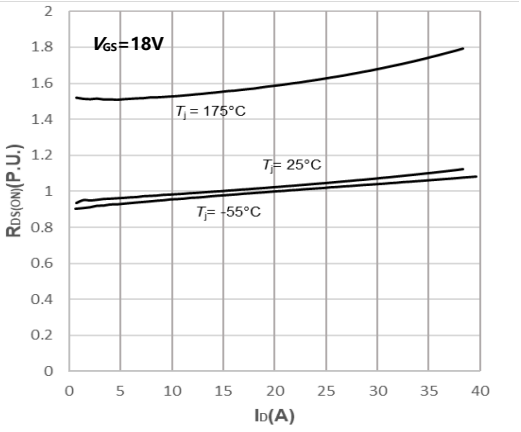


Fig6. Normalized On-Resistance vs. Drain Current for Various Temperatures

RATING AND CHARACTERISTIC CURVES

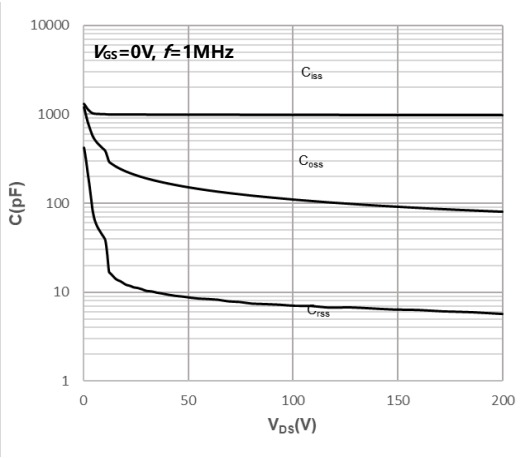


Fig7. Capacitances vs. Drain-Source Voltage (0-200V)

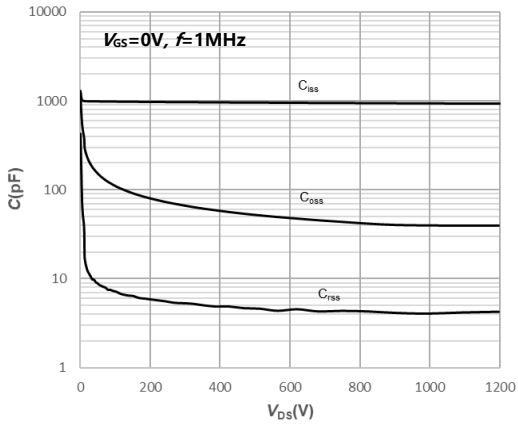


Fig8. Capacitances vs. Drain-Source Voltage (0-1200V)

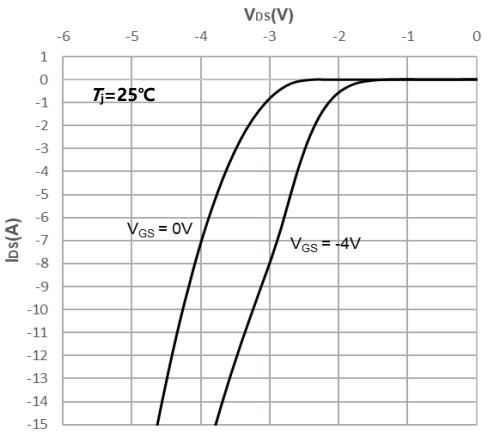


Fig9. Body Diode Characteristics

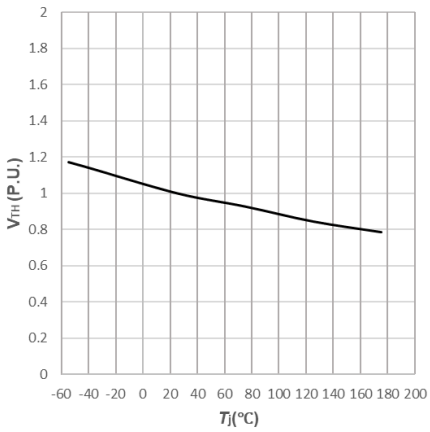


Fig10. Normalized Threshold Voltage vs. Temperature

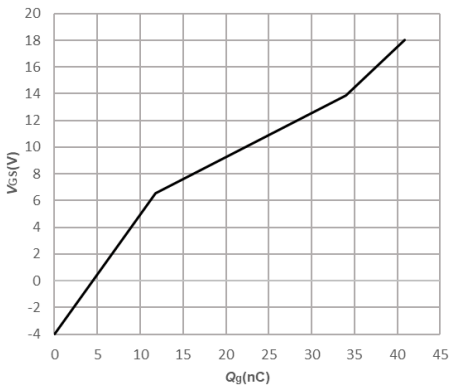


Fig11. Gate Charge Characteristics

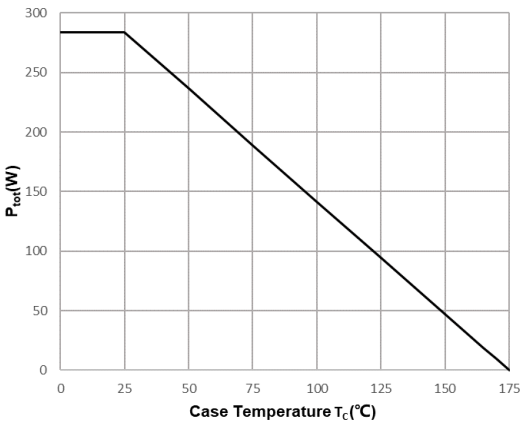


Fig12. Power Dissipation vs. Case Temperature

RATING AND CHARACTERISTIC CURVES

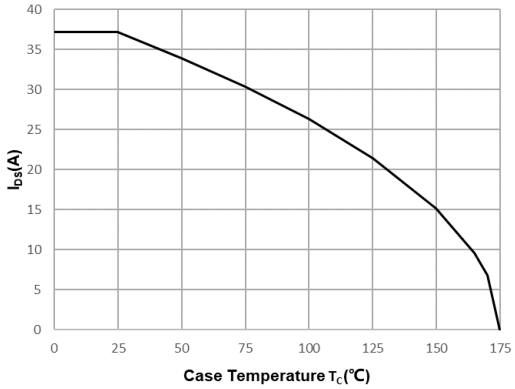
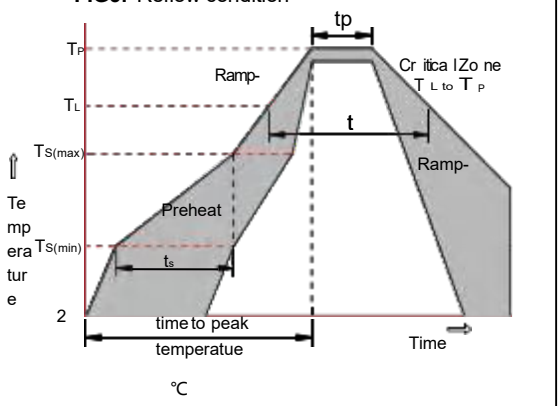


Fig13. Maximum DC Drain to Source Current vs. Case Temperature

Soldering parameters

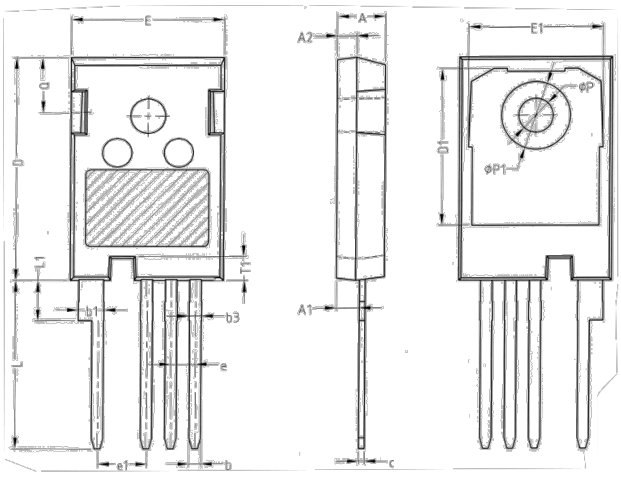
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃

FIG5: Reflow condition



Package Dimensions & Suggested Pad Layout

TO-247-4



SYMBOL	Unit: mm		
	MIN	NOM	MAX
A	4.80	5.00	5.20
A1	2.21	2.41	2.61
A2	1.80	2.00	2.20
b	1.06	1.21	1.36
b1	2.33	2.63	2.93
b3	1.07	1.30	1.60
c	0.51	0.61	0.75
D	23.30	23.45	23.60
D1	16.25	16.55	16.85
E	15.74	15.94	16.14
E1	13.72	14.02	14.32
T1	2.35	2.50	2.65
e	2.54 BSC		
e1	5.08 BSC		
Q	5.49	5.79	6.09
L	17.27	17.57	17.87
L1	3.99	4.19	4.39
ΦP	3.40	3.60	3.80
ΦP1	7.19 REF		

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