V_{DSS}	1200 V
I_D	59 A
$R_{DS(ON)}$	40 mΩ

FEATURES

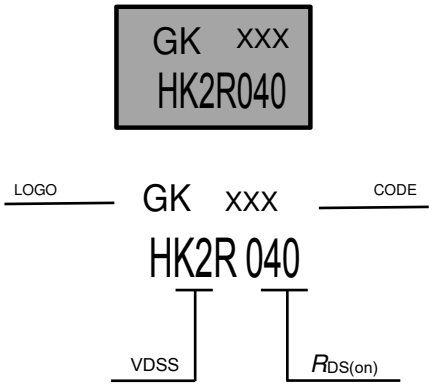
- Wide Bandgap SiC MOSFET Technology
- Low On-Resistance with High Blocking Voltage
- Low Capacitances with High-Speed Switching
- Low Reverse Recovery (Qrr)
- Easy to Parallel and Simple to Drive

BENEFITS

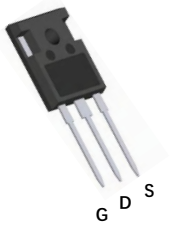
- Reduced Switching Losses
- Increased System Switching Frequency
- Increased Power Density
- Reduction of Heat Sink Requirements
- Reduced EMI

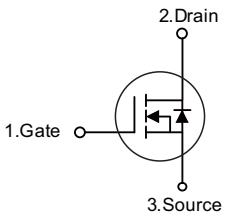
APPLICATION

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



TO-247





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℃	68	A
		V_{GS}=18V, T_C=100℃	59	
Pulsed Drain Current	I_{DM}	Pulse with T_p limited by T_{jmax}	135	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=9mA, 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=40A	-	40	52	mΩ
		V_{GS}=18V, I_D=40A, T_j=175℃		62		

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℃		1860		pF
Output Capacitance	C_{oss}			75		
Reverse Transfer Capacitance	C_{rss}			7		
Total Gate Charge	Q_g	V_{GS}=-4/18V, V_{DS}=800V, I_D=40A, T_j=25℃		80		nC
Gate-Source Charge	Q_{gs}			3		
Gate-Drain Charge	Q_{gd}			13		
Gate Resistance	R_g	V_{AC}=25mV, f=1MHz		2		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=40A, R_g=10Ω		13		ns
Rise Time	t_r			84		
Turn-Off Delay Time	$t_{d(off)}$			36		
Fall Time	t_f			28		
Turn-On Energy	E_{on}			265		μJ
Turn-Off Energy	E_{off}			45		

Reverse Diode Characteristics

Parameter	Symbol	Test Condition	Value			Unit
			Min.	Typ.	Max.	
Diode Forward Voltage	V_{SD}	V_{GS}=-4V, I_{SD}=20A, T_j=25℃	-	4.5		V
Continuous Diode Forward Current	I_S	V_{GS}=-4V, T_j=25℃		68		A
Reverse Recovery Time	t_{rr}	V_{GS} = -4V, I_{SD}=40A, V_R=800V, di/dt=800A/us, T_j=25℃		28		ns
Reverse Recovery Charge	Q_{rr}			85		nC
Peak Reverse Recovery Current	I_{rrm}			5.3		A

RATING AND CHARACTERISTIC CURVES

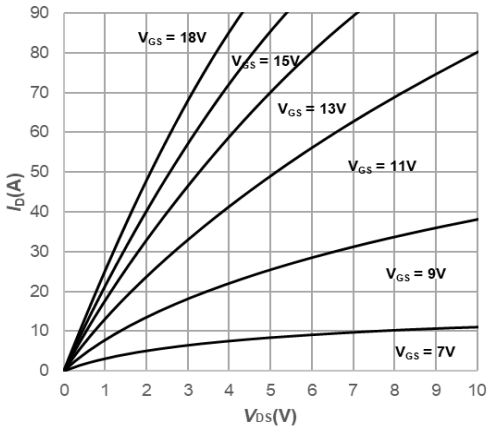


Fig1. Output Characteristics T_j=25℃

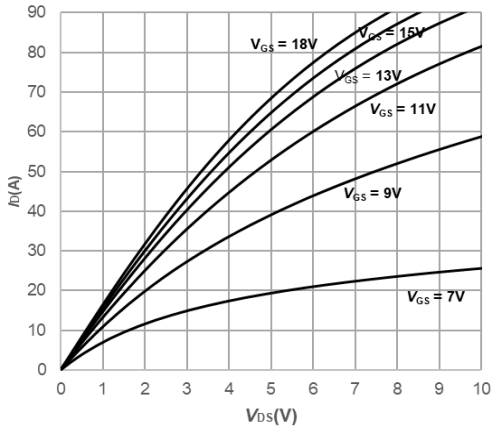


Fig2. Output Characteristics T_j=175℃

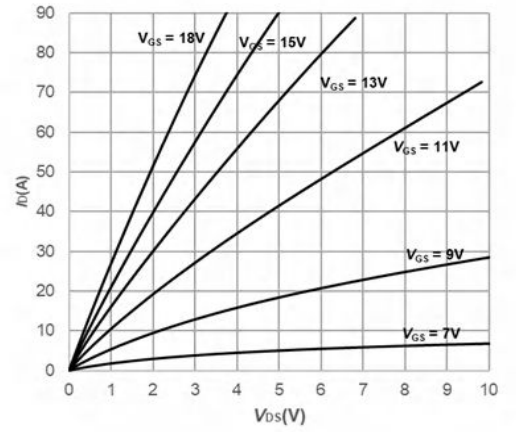


Fig3. Output Characteristics T_j=-55℃

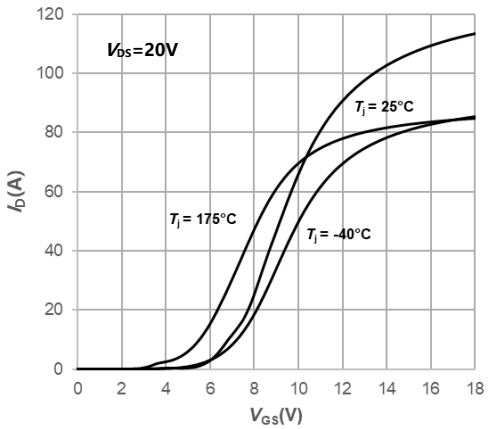


Fig4. Typical Transfer Characteristics

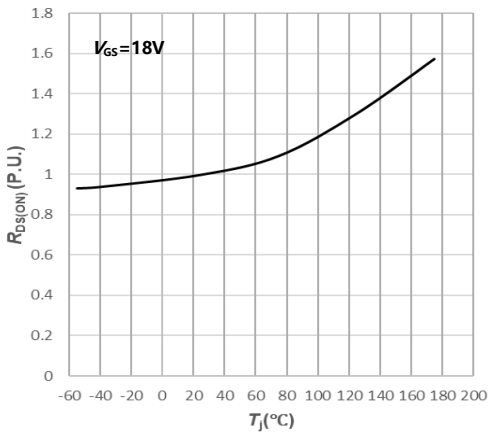


Fig5. Normalized On-Resistance vs. Temperature

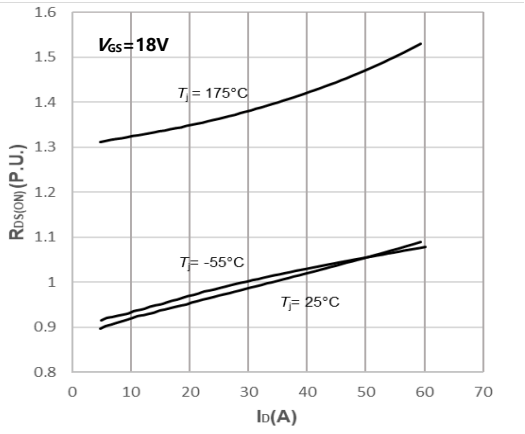


Fig6. Normalized On-Resistance vs. Drain Current for Various Temperatures

RATING AND CHARACTERISTIC CURVES

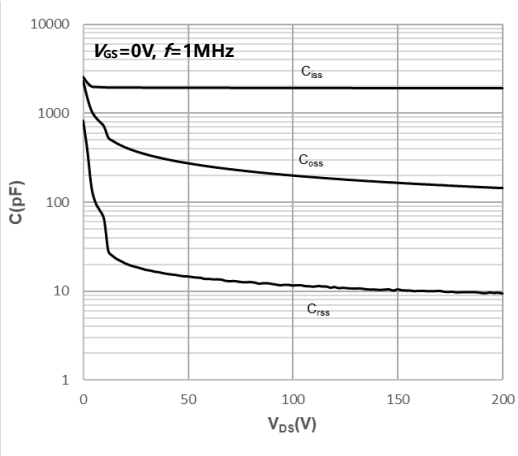


Fig7. Capacitances vs. Drain-Source Voltage (0-200V)

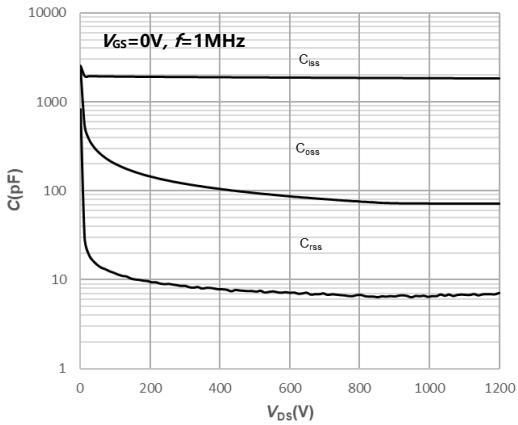


Fig8. Capacitances vs. Drain-Source Voltage (0-1200V)

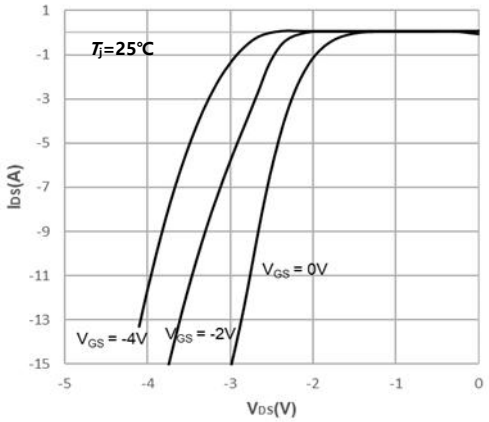


Fig9. Body Diode Characteristics

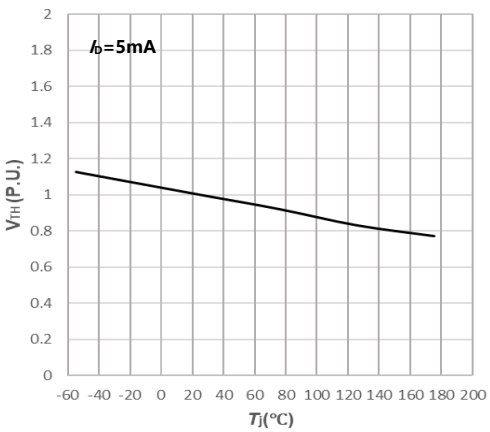
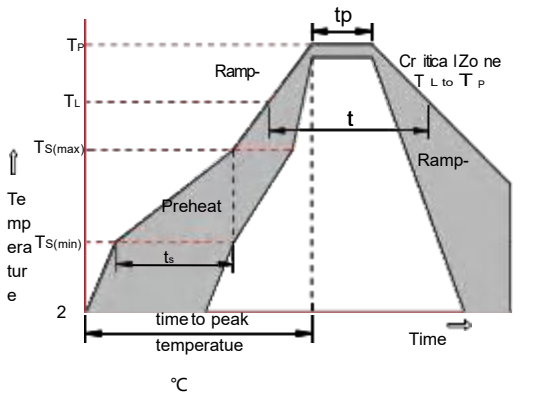


Fig10. Normalized Threshold Voltage vs. Temperature

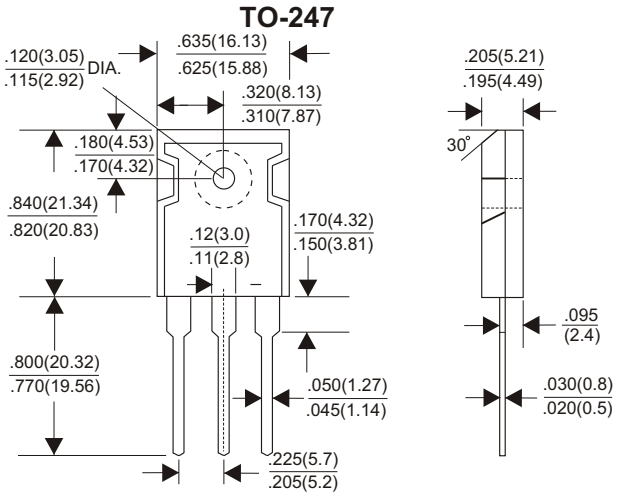
Soldering parameters

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



Dimensions in inches and (millimeters)

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