

International
Rectifier

PROVISIONAL

IRFK6H/J054

Isolated Base Power HEX-pak™

Assembly - Parallel Chip

- High Current Capability.
- UL recognized E78996.
- Electrically Isolated Base Plate.
- Easy Assembly into Equipment.



$V_{DS} = 60V$
$R_{DS(on)} = 3.3m\Omega$
$I_D = 350A$

Description

The HEX-pak™ utilizes the well-proven HEXFET™ transistor die, combining low on-state resistance with high transconductance. These superior technology die are assembled by state of the art techniques into the TO-240 package, featuring 2.5kV rms isolation and solid M5 screw connections. The small footprint means the package is highly suited to power applications where space is a premium. Available in two versions, IRFK.H... for fast switching and IRFK.J... for oscillation sensitive applications.



Absolute Maximum Ratings

	Parameter	Max.	Units
I_D @ $T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10V @$	350	A
I_D @ $T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V @$	220	
I_{DM}	Pulsed Drain Current @	1400	
	Linear Derating Factor	5.0	W/°C
P_D @ $T_C = 25^\circ C$	Power Dissipation	525	W
V_{GS}	Gate-to-Source Voltage	±20	V
V_{IN}	R.M.S. Isolation Voltage, Circuit to Base (1 Minute)	2.5	kV
T_J	Operating Junction and	-40 to 150	°C
T_{STG}	Storage Temperature Range		

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
R_{JC}	Junction-to-Case	—	—	0.20	°C/W
R_{CS}	Case-to-Sink, Flat, Greased Surface	—	0.10	—	
T	Mounting torque +10%, M5 Screw @	—	5.0	—	Nm
	Busbar to HEXPAK with M5 Screw	—	3.0	—	
wt	Approximate Weight	—	140 (5.0)	—	g (oz)

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Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$ Drain-to-Source Breakdown Voltage	60	—	—	V	$V_{GS} = 0V, I_D = 1.0mA$
$R_{DS(on)}$ Static Drain-to-Source On-Resistance $\oplus$	—	2.2	3.3	m Ω	$V_{DS} = 10V, I_D = 110A \oplus$
$I_{D(on)}$ On State Drain Current	150	—	—	A	$V_{DS} > I_{D(on)} \times R_{DS(on)} / \text{max.}, V_{GS} = 10V$
$V_{GS(th)}$ Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 1.0mA$
g_{fs} Forward Transconductance $\oplus$	186	282	—	S	$V_{DS} = 50V, I_D = 225A$
I_{OSS} Drain-to-Source Leakage Current	—	1.5	6.0	mA	$V_{DS} = 60V, V_{GS} = 0V$
I_{GSS} Gate-to-Source Forward Leakage	—	—	600	nA	$V_{GS} = 20V$
Gate-to-Source Reverse Leakage	—	—	-600	nA	$V_{GS} = -20V$
Q_g Total Gate Charge	—	780	900	nC	$I_D = 225A$
Q_{gs} Gate-to-Source Charge	—	150	220	nC	$V_{DS} = 48V$
Q_{gd} Gate-to-Drain ("Miller") Charge	—	270	400	nC	$V_{GS} = 10V \oplus$
$t_{(on)}$ Turn-On Delay Time	IRFK6H054	—	110	—	$V_{DD} = 25V$ $I_D = 225A$ $V_{GS} = 10V$ $R_\theta = 3.3\Omega \oplus$
	IRFK6J054	—	125	—	
t_r Rise Time	IRFK6H054	—	700	—	
	IRFK6J054	—	800	—	
$t_{(off)}$ Turn-Off Delay Time	IRFK6H054	—	400	—	
	IRFK6J054	—	530	—	
t_f Fall Time	IRFK6H054	—	260	—	
	IRFK6J054	—	300	—	
L_{DS} Drain Inductance to Source	—	18	—	nH	
C_{iss} Input Capacitance	—	14	—	nF	$V_{DS} = 0V$
C_{oss} Output Capacitance	—	2.5	—	nF	$V_{DS} = 25V$
C_{rss} Reverse Transfer Capacitance	—	0.75	—	nF	$f = 1.0MHz$

Source-Drain Ratings and Characteristics

Parameter	Min.	Typ.	Max.	Units	Conditions
I_S Continuous Source Current (Body Diode)	—	—	300	A	Modified MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM} Pulsed Source Current (Body Diode) $\oplus$	—	—	100	A	
V_{SD} Diode Forward Voltage	—	—	2.5	V	$T_J = 25^\circ\text{C}, I_S = 225A, V_{GS} = 0V \oplus$
t_{rr} Reverse Recovery Time	71	150	320	ns	$T_J = 25^\circ\text{C}, I_F = 225A$
Q_{rr} Reverse Recovery Charge	4.4	10	23	μC	$di/dt = 400A/\mu\text{s} \oplus$

Notes:

- Repetitive rating; pulse width limited by maximum junction temperature.
- A mounting compound is recommended and the torque should be rechecked after a period of three hours to allow for the spread of the compound.
- Limited by package to 200 amperes maximum continuous current.
- Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.