

International Rectifier

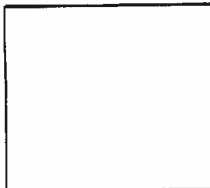
PROVISIONAL

IRFK6H/J054

Isolated Base Power HEX-pak™

Assembly - Parallel Chip

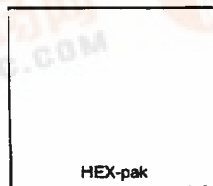
- High Current Capability.
- UL recognized E78996.
- Electrically Isolated Base Plate.
- Easy Assembly into Equipment.



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

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, $V_{GS} @ 10V \text{ } \textcircled{\text{D}}$	350	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V \text{ } \textcircled{\text{D}}$	220	
I_{DM}	Pulsed Drain Current $\text{ } \textcircled{\text{D}}$	1400	
	Linear Derating Factor	5.0	W/°C
$P_D @ T_C = 25^\circ C$	Power Dissipation	625	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
$R_{\theta JC}$	Junction-to-Case	—	—	0.20	°C/W
$R_{\theta CS}$	Case-to-Sink, Flat, Greased Surface	—	0.10	—	°C/W
	Mounting torque $\pm 10\%$, M5 Screw $\text{ } \textcircled{\text{D}}$	—	5.0	—	
	Busbar to HEXPAK with M5 Screw	—	3.0	—	Nm
	Approximate Weight	—	140 (5.0)	—	g (oz)




IRFK6H/J054



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

Parameter	Min.	Typ.	Max.	Units	Conditions	
$V_{(BR)DSS}$	60	—	—	V	$V_{GS} = 0V, I_D = 1.0mA$	
$R_{DS(ON)}$	—	2.2	3.3	m Ω	$V_{GS} = 10V, I_D = 110A$ ①	
$I_{D(ON)}$	150	—	—	A	$V_{DS} > I_{D(ON)} \times R_{DS(ON)} / \text{max.}, V_{GS} = 10V$	
$V_{GS(th)}$	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 1.0mA$	
g_{fs}	186	282	—	S	$V_{DS} = 50V, I_D = 225A$	
I_{DSS}	Drain-to-Source Leakage Current	—	1.5	mA	$V_{DS} = 60V, V_{GS} = 0V$	
		—	6.0		$V_{DS} = 48V, V_{GS} = 0V, T_J = 125^\circ\text{C}$	
I_{GSS}	Gate-to-Source Leakage	—	600	nA	$V_{DS} = 20V$	
		—	-600		$V_{GS} = -20V$	
Q_g	Total Gate Charge	—	780	900	$I_D = 225A$	
Q_{gs}	Gate-to-Source Charge	—	150	220	$V_{DS} = 48V$	
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	270	400	$V_{GS} = 10V$ ②	
$t_{(on)}$	Turn-On Delay Time	IRFK6H054	—	110	ns	$V_{DD} = 25V$ $I_D = 225A$ $V_{GS} = 10V$ $R_S = 3.3\Omega$ ③
		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	
C_{oss}	Output Capacitance	—	2.5	—	nF	
C_{rss}	Reverse Transfer Capacitance	—	0.75	—	nF	
					$f = 1.0MHz$	

Source-Drain Ratings and Characteristics

Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	—	—	300	A	Modified MOSFET symbol showing the integral reverse p-n junction diode. 
I_{SM}	—	—	1100		
V_{SD}	—	—	2.5	V	$T_J = 25^\circ\text{C}, I_S = 225A, V_{GS} = 0V$ ④
t_{rr}	71	150	320	ns	$T_J = 25^\circ\text{C}, I_F = 225A$
Q_{rr}	4.4	10	23	μC	$di/dt = 400A/\mu\text{s}$ ⑤

Notes:

- ① Repetitive rating; pulse width limited by maximum junction temperature.
- ② 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.
- ③ Limited by package to 200 amperes maximum continuous current.
- ④ Pulse width $\leq 300\mu\text{s}$; duty cycle $\leq 2\%$.