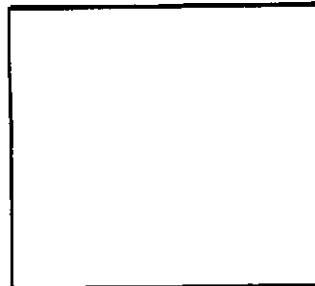


## Isolated Base Power HEX-pak™

## 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, $V_{GS} @ 10V \text{ @}$	350	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10V \text{ @}$	220	
$I_{DM}$	Pulsed Drain Current $\text{ @}$	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	$\pm 20$	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	—	
T	Mounting torque +10%, M5 Screw $\text{ @}$	—	5.0	—	Nm
	Busbar to HEXPAK with M5 Screw	—	3.0	—	
wt	Approximate Weight	—	140 (5.0)	—	g (oz)

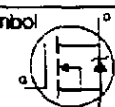
# IRFK6H/J054



## 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	$m\Omega$	$V_{GS} = 10V, I_D = 110A$ ②	
$I_{D(ON)}$	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 Forward Leakage	—	—	600	nA	$V_{GS} = 20V$
	Gate-to-Source Reverse Leakage	—	—	-600		$V_{GS} = -20V$
$Q_g$	Total Gate Charge	—	780	900	nC	$I_D = 225A$
$Q_{gs}$	Gate-to-Source Charge	—	150	220		$V_{DS} = 48V$
$Q_{gd}$	Gate-to-Drain ("Miller") Charge	—	270	400		$V_{GS} = 10V$ ③
$t_{(on)}$	Turn-On Delay Time	IRFK6H054	—	110	—	$V_{DD} = 25V$ $I_D = 225A$ $V_{GS} = 10V$ $R_s = 3.3\Omega$ ④
		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	—		$V_{DS} = 25V$
$C_{rss}$	Reverse Transfer Capacitance	—	0.75	—		$f = 1.0MHz$

## 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	$T_J = 25^\circ\text{C}, I_S = 225A, V_{GS} = 0V$ ⑤
$t_{rr}$	71	150	320	ns	$T_J = 25^\circ\text{C}, I_F = 225A$
$Q_{rr}$	4.4	10	23	$\mu\text{C}$	$di/dt = 400A/\mu\text{s}$ ⑥

### 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  $\leq 2\%$ .