



44A, 50V, 0.022 Ohm, N-Channel UltraFET Power MOSFET

This N-Channel power MOSFET is manufactured using the innovative UltraFET™ process. This advanced process technology achieves the lowest possible on-resistance per silicon area, resulting in outstanding performance. This device is capable of withstanding high energy in the avalanche mode and the diode exhibits very low reverse recovery time and stored charge. It was designed for use in applications where power efficiency is important, such as switching regulators, switching converters, motor drivers, relay drivers, low-voltage bus switches, and power management in portable and battery-operated products.

Ordering Information

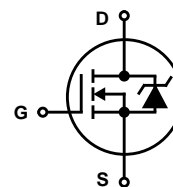
PART NUMBER	PACKAGE	BRAND
HUF75229P3	TO-220AB	75229P

NOTE: When ordering use the entire part number.

Features

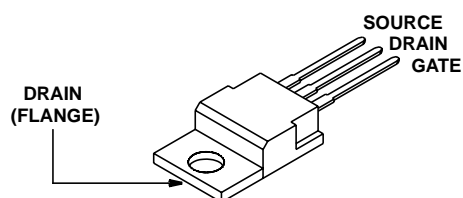
- 44A, 50V
- Low On-Resistance, $r_{DS(ON)} = 0.022\Omega$
- Temperature Compensating PSPICE Model
- Thermal Impedance SPICE Model
- Peak Current vs Pulse Width Curve
- UIS Rating Curve
- Related Literature
 - TB334, "Guidelines for Soldering Surface Mount Components to PC Boards"

Symbol



Packaging

JEDEC TO-220AB



HUF75229P3

Absolute Maximum Ratings $T_C = 25^{\circ}\text{C}$, Unless Otherwise Specified

			UNITS
Drain to Source Voltage (Note 1)	V_{DSS}	50	V
Drain to Gate Voltage ($R_{GS} = 20\text{k}\Omega$) (Note 1)	V_{DGR}	50	V
Gate to Source Voltage	V_{GS}	± 20	V
Drain Current			
Continuous (Figure 2)	I_D	44	A
Pulsed Drain Current	I_{DM}	Figure 5	
Pulsed Avalanche Rating	E_{AS}	Figure 6, 14, 15	
Power Dissipation	P_D	90	W
Derate Above 25°C		0.6	W/ $^{\circ}\text{C}$
Operating and Storage Temperature	T_J, T_{STG}	-55 to 175	$^{\circ}\text{C}$
Maximum Temperature for Soldering			
Leads at 0.063in (1.6mm) from Case for 10s	T_L	300	$^{\circ}\text{C}$
Package Body for 10s, See Techbrief 334	T_{pkg}	260	$^{\circ}\text{C}$

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTE:

1. $T_J = 25^{\circ}\text{C}$ to 150°C .

Electrical Specifications $T_C = 25^{\circ}\text{C}$, Unless Otherwise Specified

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNITS
Drain to Source Breakdown Voltage	BV _{DSS}	I _D = 250μA, V _{GS} = 0V (Figure 11)		50	-	-	V
Gate to Source Threshold Voltage	V _{GS(TH)}	V _{GS} = V _{DS} , I _D = 250μA (Figure 10)		2	-	4	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 45V, V _{GS} = 0V		-	-	1	μA
		V _{DS} = 40V, V _{GS} = 0V, T _C = 150°C		-	-	250	μA
Gate to Source Leakage Current	I _{GSS}	V _{GS} = ±20V		-	-	±100	nA
Drain to Source On Resistance	r _{DS(ON)}	I _D = 44A, V _{GS} = 10V (Figure 9)		0.017	0.020	0.022	Ω
Turn-On Time	t _{ON}	V _{DD} = 30V, I _D ≅ 44A, R _L = 0.68Ω, V _{GS} = 10V, R _{GS} = 9.1Ω (Figures 18, 19)		-	-	105	ns
Turn-On Delay Time	t _{d(ON)}			-	12	-	ns
Rise Time	t _r			-	58	-	ns
Turn-Off Delay Time	t _{d(OFF)}			-	33	-	ns
Fall Time	t _f			-	33	-	ns
Turn-Off Time	t _{OFF}			-	-	100	ns
Total Gate Charge	Q _{g(TOT)}	V _{GS} = 0V to 20V	V _{DD} = 30V, I _D ≅ 44A, R _L = 0.68Ω I _{g(REF)} = 1.0mA (Figures 13, 16, 17)	-	60	75	nC
Gate Charge at 10V	Q _{g(10)}	V _{GS} = 0V to 10V		-	35	43	nC
Threshold Gate Charge	Q _{g(TH)}	V _{GS} = 0V to 2V		-	2.0	2.5	nC
Input Capacitance	C _{ISS}	V _{DS} = 25V, V _{GS} = 0V, f = 1MHz (Figure 12)		-	1060	-	pF
Output Capacitance	C _{OSS}			-	405	-	pF
Reverse Transfer Capacitance	C _{RSS}			-	95	-	pF
Thermal Resistance Junction to Case	R _{θJC}	(Figure 3)		-	-	1.66	°C/W
Thermal Resistance Junction to Ambient	R _{θJA}	TO-220		-	-	62	°C/W

Source to Drain Diode Specifications

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Source to Drain Diode Voltage	V_{SD}	$I_{SD} = 44\text{A}$	-	-	1.25	V
Reverse Recovery Time	t_{rr}	$I_{SD} = 44\text{A}$, $dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	-	72	ns
Reverse Recovered Charge	Q_{RR}	$I_{SD} = 44\text{A}$, $dI_{SD}/dt = 100\text{A}/\mu\text{s}$	-	-	120	nC