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RFP25N05

25A, 50V, 0.047 Ohm, N-Channel Power MOSFET

The RFP25N05 N-channel power MOSFET is manufactured using the MegaFET process. This process which uses feature sizes approaching those of LSI integrated circuits, gives optimum utilization of silicon, resulting in outstanding performance. It was designed for use in applications such as switching regulators, switching converters, motor drivers, and relay drivers. This transistor can be operated directly from integrated circuits.

Features

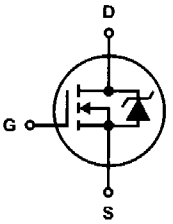
- 25A, 50V
- $r_{DS(ON)} = 0.047\Omega$
- Temperature Compensating PSPICE® Model
- Peak Current vs Pulse Width Curve
- UIS Rating Curve
- 175°C Operating Temperature

Ordering Information

PART NUMBER	PACKAGE	BRAND
RFP25N05	TO-220AB	RFP25N05

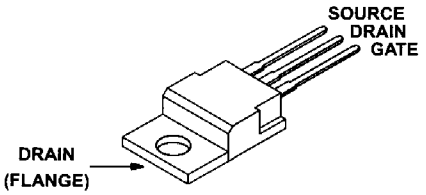
NOTE: When ordering use the entire part number.

Symbol



Packaging

JEDEC TO-220AB



NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

Absolute Maximum Ratings $T_C = 25^oC$, Unless Otherwise Specified

		RFP25N05	UNITS
Drain to Source Voltage (Note 1)	V_{DSS}	50	V
Drain to Gate Voltage	V_{DGR}	50	V
Gate to Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	25	A
Pulsed Drain Current (Note 3)	I_{DM}	Refer to Peak Current Curve	A
Pulsed Avalanche Rating	E_{AS}	Refer to UIS Curve	
Maximum Power Dissipation	P_D	72	W
Linear Derating Factor		0.48	W/°C
Operating and Storage Temperature	T_J, T_{STG}	-55 to 175	°C
Maximum Temperature for Soldering			
Leads at 0.063in (1.6mm) from Case for 10s	T_L	300	°C
Package Body for 10s, See Techbrief 334	T_{pkg}	260	°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. $T_J = 25^oC$ to 150^oC.

Electrical Specifications $T_C = 25^oC$, 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 Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250mA (Figure 10)		2	-	4	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = Rated BV_{DSS}, V_{GS} = 0V		-	-	1	µA
		V_{DS} = 0.8 x Rated BV_{DSS}, $T_C = 150^oC$		-	-	25	µA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V		-	-	±100	nA
Drain to Source On Resistance	$r_{DS(ON)}$	I_D = 25A, V_{GS} = 10V (Figure 9)		-	-	0.047	Ω
Turn-On Time	t_{ON}	V_{DD} = 25V, $I_D \approx$ 12.5A, R_L = 2.0Ω, V_{GS} = 10V, R_G = 10Ω (Figure 13)		-	-	60	ns
Turn-On Delay Time	$t_{d(ON)}$			-	14	-	ns
Rise Time	t_r			-	30	-	ns
Turn-Off Delay Time	$t_{d(OFF)}$			-	45	-	ns
Fall Time	t_f			-	22	-	ns
Turn-Off Time	t_{OFF}			-	-	100	ns
Total Gate Charge	$Q_{G(TOT)}$	V_{GS} = 0V to 20V	V_{DD} = 40V, I_D = 25A, R_L = 1.6Ω, $I_{g(REF)}$ = 0.75mA (Figure 13)	-	-	80	nC
Gate Charge at 10V	$Q_{G(10)}$	V_{GS} = 0V to 10V		-	-	45	nC
Threshold Gate Charge	$Q_{G(TH)}$	V_{GS} = 0V to 2V		-	-	3	nC
Input Capacitance	C_{ISS}	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz (Figure 12)		-	1075	-	pF
Output Capacitance	C_{OSS}			-	350	-	pF
Reverse Transfer Capacitance	C_{RSS}			-	100	-	pF
Thermal Resistance Junction to Case	$R_{\theta JC}$	(Figure 3)		-	-	2.083	°C/W
Thermal Resistance Junction to Ambient	$R_{\theta JA}$			-	-	80	°C/W

Source to Drain Diode Specifications

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNITS
Source to Drain Diode Voltage (Note 2)	V_{SD}	I_{SD} = 25A	-	-	1.5	V
Reverse Recovery Time	t_{RR}	I_{SD} = 25A, dI_{SD}/dt = 100A/µs	-	-	125	ns

NOTES:

2. Pulse test: pulse width ≤ 300µs, duty cycle ≤ 2%.
3. Repetitive rating: pulse width limited by maximum junction temperature. See Transient Thermal Impedance curve