

RFH45N05, RFH45N06

Power MOS Field-Effect Transistors

**N-Channel Enhancement-Mode
 Power Field-Effect Transistors**

45 A, 50 V - 60 V
 $r_{DS(on)} = 0.040 \Omega$

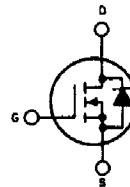
Features:

- SOA is power-dissipation limited
- Nanosecond switching speeds
- Linear transfer characteristics
- High input impedance
- Majority carrier device
- High-current, low-inductance package

The RFH45N05 and RFH45N06* are n-channel enhancement-mode silicon-gate power field-effect transistors designed for applications such as switching regulators, switching converters, motor drivers, relay drivers, and drivers for high-power bipolar switching transistors requiring high speed and low gate-drive power. These types can be operated directly from integrated circuits.

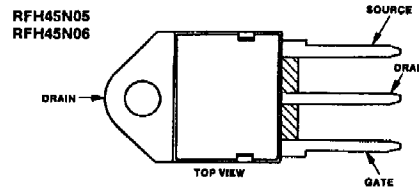
The RFH-types are supplied in the JEDEC TO-218AC plastic package.

TERMINAL DIAGRAM



N-CHANNEL ENHANCEMENT MODE

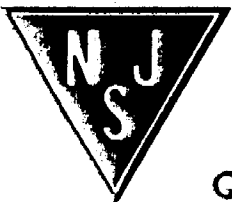
TERMINAL DESIGNATIONS



JEDEC TO-218AC

MAXIMUM RATINGS, Absolute-Maximum Values ($T_C = 25^\circ C$):

	RFH45N05	RFH45N06	
DRAIN-SOURCE VOLTAGE	50	60	V
DRAIN-GATE VOLTAGE, $R_{gs} = 1 M\Omega$	50	60	V
GATE-SOURCE VOLTAGE	± 20		V
DRAIN CURRENT, RMS Continuous	45		A
Pulsed	100		A
POWER DISSIPATION @ $T_C = 25^\circ C$	150		W
Derate above $T_C = 25^\circ C$	1.2		W/ $^\circ C$
OPERATING AND STORAGE TEMPERATURE	-55 to +150		$^\circ C$



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.

RFH45N05, RFH45N06

ELECTRICAL CHARACTERISTICS, at Case Temperature (T_c) = 25°C unless otherwise specified.

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFH45N05		RFH45N06		
			Min.	Max.	Min.	Max.	
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 1 mA V _{GS} = 0	50	—	60	—	V
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} I _D = 1 mA	2	4	2	4	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40 V V _{GS} = 50 V	—	1	—	—	μA
		T _c = 125°C V _{DS} = 40 V V _{GS} = 50 V	—	50	—	50	
Gate-Source Leakage Current	I _{GSS}	V _{GS} = ±20 V V _{DS} = 0	—	100	—	100	nA
Drain-Source On Voltage	V _{DS(on)} [■]	I _D = 22.5 A V _{GS} = 10 V	—	0.9	—	0.9	V
		I _D = 45 A V _{GS} = 10 V	—	3.6	—	3.6	
Static Drain-Source On Resistance	r _{DS(on)} [■]	I _D = 22.5 A V _{GS} = 10 V	—	.04	—	.04	Ω
Forward Transconductance	g _{fs} [■]	V _{DS} = 10 V I _D = 22.5 A	10	—	10	—	mho
Input Capacitance	C _{iss}	V _{DS} = 25 V	—	3000	—	3000	pF
Output Capacitance	C _{oss}	V _{GS} = 0 V	—	1800	—	1800	
Reverse Transfer Capacitance	C _{rss}	f = 1MHz	—	750	—	750	
Turn-On Delay Time	t _{d(on)}	V _{DS} = 30 V	40(typ)	80	40(typ)	80	ns
Rise Time	t _r	I _D = 22.5 A	310(typ)	475	310(typ)	475	
Turn-Off Delay Time	t _{d(off)}	R _{θ(jc)} = R _{θ(jc)} = 50Ω	220(typ)	350	220(typ)	350	
Fall Time	t _f	V _{GS} = 10 V	240(typ)	375	240(typ)	375	
Thermal Resistance Junction-to-Case	R _{θ(jc)}	RFH45N05, RFH45N06 Series	—	0.83	—	0.83	°C/W

■ Pulsed: Pulse duration = 300 μs max., duty cycle = 2%.

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFH45N05		RFH45N06		
			Min.	Max.	Min.	Max.	
Diode Forward Voltage	V _{SD} [*]	I _{SD} = 22.5A	—	1.4	—	1.4	V
Reverse Recovery Time	t _{rr}	I _F = 4A, d _{IF} /d _I = 100 A/μs	150 (typ.)		150 (typ.)		ns

* Pulse Test: Width ≤ 300 μs, Duty cycle ≤ 2%.