

RFH35N08, RFH35N10

File Number 1634

Power MOS Field-Effect Transistors

N-Channel Enhancement-Mode Power Field-Effect Transistors

35 A, 80 V - 100 V

$r_{DS(on)} = 0.055 \Omega$

Features:

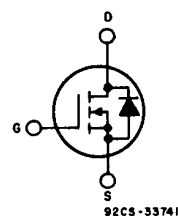
- SOA is power-dissipation limited
- Nanosecond switching speeds
- Linear transfer characteristics
- High input impedance
- Majority carrier device
- High-current, low-inductance package

The RFH35N08 and RFH35N10* 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.

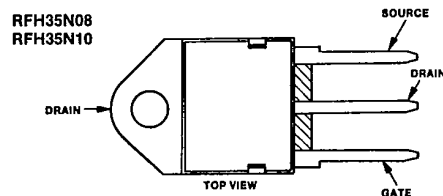
*The RFH35N08 and RFH35N10 types were formerly RCA developmental numbers TA9481A and TA9481B respectively.

TERMINAL DIAGRAM



N-CHANNEL ENHANCEMENT MODE

TERMINAL DESIGNATIONS



JEDEC TO-218AC

MAXIMUM RATINGS, Absolute-Maximum Values ($T_c = 25^\circ\text{C}$):

	RFH35N08	RFH35N10	
DRAIN-SOURCE VOLTAGE	80	100	V
DRAIN-GATE VOLTAGE, $R_{gs} = 1 \text{ M}\Omega$	80	100	V
GATE-SOURCE VOLTAGE	± 20		V
DRAIN CURRENT, RMS Continuous	35		A
Pulsed	100		A
POWER DISSIPATION @ $T_c = 25^\circ\text{C}$	150		W
Derate above $T_c = 25^\circ\text{C}$	1.2		W/ $^\circ\text{C}$
OPERATING AND STORAGE TEMPERATURE	-55 to +150		$^\circ\text{C}$

RFH35N08, RFH35N10

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFH35N08		RFH35N10		
			Min.	Max.	Min.	Max.	
Drain-Source Breakdown Voltage	BV _{DSS}	I _D = 1 mA V _{GS} = 0	80	—	100	—	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} = 65 V	—	1	—	—	μA
		V _{DS} = 80 V	—	—	—	1	
		T _C = 125°C V _{DS} = 65 V	—	50	—	—	
		V _{DS} = 80 V	—	—	—	50	
Gate-Source Leakage Current	I _{GSS}	V _{GS} = ± 20 V V _{DS} = 0	—	100	—	100	nA
Drain-Source On Voltage	V _{DS(on)} ^a	I _D = 17.5 A V _{GS} = 10 V	—	0.963	—	0.963	V
		I _D = 35 A V _{GS} = 10 V	—	3.0	—	3.0	
Static Drain-Source On Resistance	r _{DS(on)} ^a	I _D = 17.5 A V _{GS} = 10 V	—	0.055	—	0.055	Ω
Forward Transconductance	g _{fs} ^a	V _{DS} = 10 V I _D = 17.5 A	10	—	10	—	mho
Input Capacitance	C _{iss}	V _{DS} = 25 V	—	3000	—	3000	pF
Output Capacitance	C _{oss}	V _{GS} = 0 V	—	1500	—	1500	
Reverse Transfer Capacitance	C _{rss}	f = 1 MHz	—	600	—	600	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 50 V	45(typ)	100	45(typ)	100	ns
Rise Time	t _r	I _D = 17.5 A	225(typ)	450	225(typ)	450	
Turn-Off Delay Time	t _{d(off)}	R _{gen} =R _{gs} =50Ω	240(typ)	450	240(typ)	450	
Fall Time	t _f	V _{GS} = 10 V	165(typ)	350	165(typ)	350	
Thermal Resistance Junction-to-Case	Rθ _{JC}	RFH35N08, RFH35N10 Series	—	0.83	—	0.83	°C/W

^aPulsed: Pulse duration = 300 μs max., duty cycle = 2%.

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

CHARACTERISTIC	TEST CONDITIONS	LIMITS				UNITS		
		RFH35N08		RFH35N10				
		Min.	Max.	Min.	Max.			
Diode Forward Voltage	V_{SD}^*	$I_{SD} = 17.5A$		—	1.4	—	1.4	V
Reverse Recovery Time	t_{rr}	$I_F = 4A, dI_F/dt = 100 A/\mu s$		200 (typ.)		200 (typ.)		ns

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

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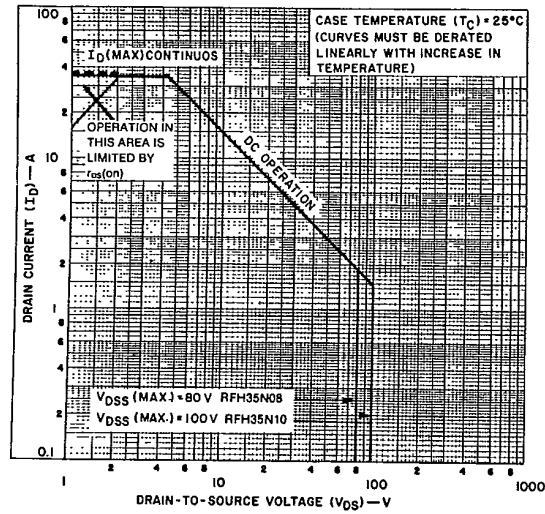


Fig. 1 - Maximum safe operating areas for all types.

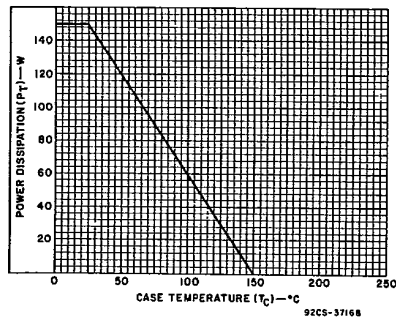


Fig. 2 - Power vs. temperature derating curve for all types.

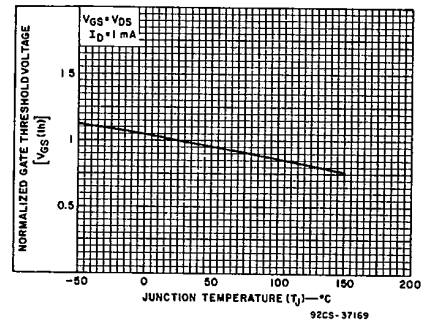


Fig. 3 - Typical normalized gate threshold voltage as a function of junction temperature for all types.

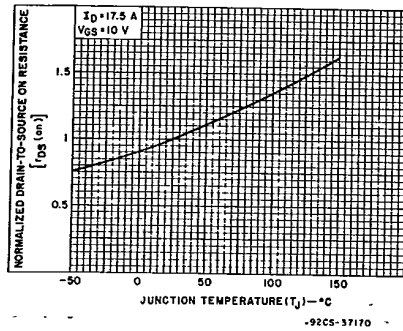


Fig. 4 - Normalized drain-to-source on resistance to junction temperature for all types.

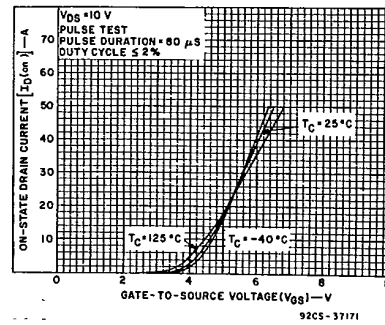


Fig. 5 - Typical transfer characteristics for all types.

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