

# Silicon N-MOSFET Transistor

## **TA9438B**

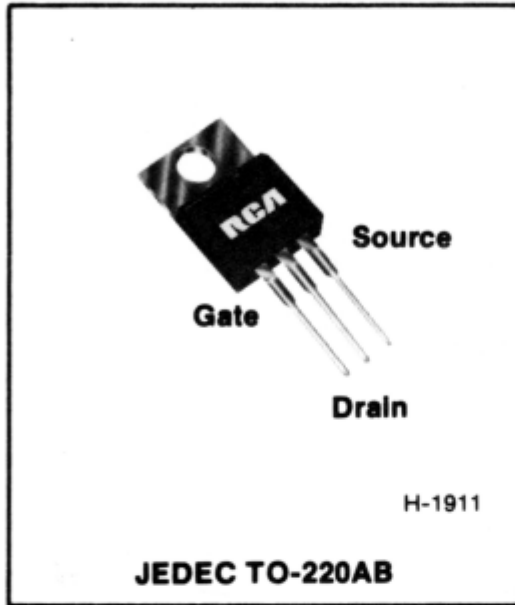
400V / 10A

# DATASHEET

OEM – RCA

Source: RCA Databook MOSFET 1984

### Developmental Types



## N-Channel Enhancement Mode Conductivity-Modulated Power Field-Effect Transistors

10A, 350V and 400V  
 $V_{DS(on)}$ : 2V

**Features:**

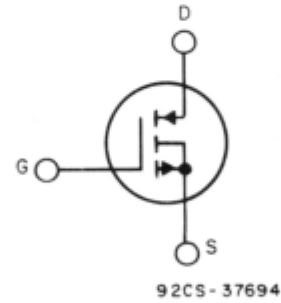
- Low on-state resistance
- Microsecond switching speeds
- High input impedance

**Applications:**

- Motor drives
- Power supplies
- Crowbar circuits
- Protective circuits

The TA9438A and TA9438B are n-channel enhancement-mode conductivity-modulated power field-effect transistors designed for applications such as switching regulators, switching converters and motor drivers.

**TERMINAL DIAGRAM**



**N-CHANNEL ENHANCEMENT MODE**

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

	TA9438A	TA9438B	
Drain-Source Voltage	350	400	V
Gate-Source Voltage	$\pm 20$		V
Drain Current	10		A
Gate Threshold Voltage	2-4		V
Drain Current (80% of Rated $V_{DS}$ )	10		$\mu A$
Gate-Source Leakage Current	100		nA
Drain-Source ON Voltage (At Rated $I_D$ , $V_{GS} = 10 V$ )	2		V
Thermal Resistance (J-C)	2.08		$^\circ C/W$
$T_{stg}, T_J(max)$	-55 to +150		$^\circ C$

File No. 1534

TA9438A

TA9438B

ELECTRICAL CHARACTERISTICS, at Case Temperature (T<sub>c</sub>) = 25° C unless otherwise specified.

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			TA9438A		TA9438B		
			Min.	Max.	Min.	Max.	
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	I <sub>D</sub> = 1 mA V <sub>GS</sub> = 0	350	—	400	—	V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>GS</sub> = V <sub>DS</sub> I <sub>D</sub> = 1 mA	2	4	2	4	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 280 V	—	10	—	—	μA
		V <sub>DS</sub> = 320 V	—	—	—	10	
		T <sub>c</sub> = 125° C	—	500	—	—	
		V <sub>DS</sub> = 280 V	—	—	—	500	
Gate-Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ± 20 V V <sub>DS</sub> = 0	—	100	—	100	nA
On-State Gate Voltage	V <sub>GS(on)</sub> <sup>a</sup>	V <sub>DS</sub> = 2 V I <sub>D</sub> = 10 A	—	10	—	10	V
		V <sub>DS</sub> = 1.5 V I <sub>D</sub> = 5 A	—	10	—	10	
Drain-Source On Voltage	V <sub>DS(on)</sub> <sup>a</sup>	I <sub>D</sub> = 10 A V <sub>GS</sub> = 10 V	—	2	—	2	V
		I <sub>D</sub> = 5 A V <sub>GS</sub> = 10 V	—	1.5	—	1.5	
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = 25 V	—	650	—	650	pF
Output Capacitance	C <sub>oss</sub>	V <sub>GS</sub> = 0 V	—	230	—	230	
Reverse Transfer Capacitance	C <sub>rss</sub>	f = 1 MHz	—	60	—	60	
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DS</sub> = 30	—	0.5	—	0.5	μs
Rise Time	t <sub>r</sub>	I <sub>D</sub> = 10 A	—	0.5	—	0.5	
Turn-Off Delay Time	t <sub>d(off)</sub>	R <sub>gen</sub> = R <sub>gs</sub> = 50 Ω	—	0.5	—	0.5	
Fall Time	t <sub>f</sub>	V <sub>GS</sub> = 10 V	—	2.5	—	2.5	
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>	TA9438A, TA9438B	—	2.08	—	2.08	°C/W

<sup>a</sup>Pulsed: Pulse duration = 300 μs max., duty cycle = 2%.