

**RFK35N08, RFK35N10**

File Number 1499

**Power MOS Field-Effect Transistors**

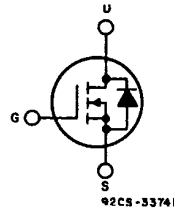
**N-Channel Enhancement-Mode  
Power Field-Effect Transistors**

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

**N-CHANNEL ENHANCEMENT MODE**

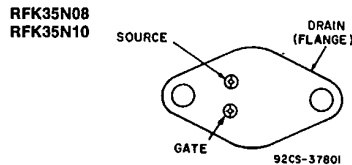


**TERMINAL DIAGRAM**

The RFK35N08 and RFK35N10\* 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 RFK-types are supplied in the JEDEC TO-204AE steel package.

**TERMINAL DESIGNATIONS**



**JEDEC TO-204AE**

\*The RFK35N08 and RFK35N10-types were formerly RCA developmental numbers TA9288A and TA9288B, respectively.

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

	RFK35N08	RFK35N10	
DRAIN-SOURCE VOLTAGE .....	80	100	V
DRAIN-GATE VOLTAGE, $R_{GS}=1 M\Omega$ .....	80	100	V
GATE-SOURCE VOLTAGE .....	±20		V
DRAIN CURRENT, RMS Continuous .....	35		A
Pulsed .....	100		A
POWER DISSIPATION @ $T_C=25^\circ C$ .....	150		W
Derate above $T_C=25^\circ C$ .....	1.2		W/°C
OPERATING AND STORAGE TEMPERATURE .....	-55 to +150		°C

## RFK35N08, RFK35N10

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

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFK35N08		RFK35N10		
			MIN.	MAX.	MIN.	MAX.	
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D=1 \text{ mA}$ $V_{GS}=0$	80	—	100	—	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}$ $I_D=1 \text{ mA}$	2	4	2	4	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS}=65 \text{ V}$ $V_{DS}=80 \text{ V}$	—	1	—	—	$\mu\text{A}$
		$T_C=125^\circ\text{C}$ $V_{GS}=65 \text{ V}$ $V_{DS}=80 \text{ V}$	—	50	—	50	
Gate-Source Leakage Current	$I_{DSS}$	$V_{GS}=\pm 20 \text{ V}$ $V_{DS}=0$	—	100	—	100	nA
Drain-Source On Voltage	$V_{DS(on)}^a$	$I_D=17.5 \text{ A}$ $V_{GS}=10 \text{ V}$	—	0.9625	—	0.9625	V
		$I_D=35 \text{ A}$ $V_{GS}=10 \text{ V}$	—	3.5	—	3.5	
Static Drain-Source On Resistance	$r_{DS(on)}^a$	$I_D=17.5 \text{ A}$ $V_{GS}=10 \text{ V}$	—	0.055	—	0.055	$\Omega$
Forward Transconductance	$g_m^a$	$V_{DS}=10 \text{ V}$ $I_D=17.5 \text{ A}$	10	—	10	—	mho
Input Capacitance	$C_{iss}$	$V_{DS}=25 \text{ V}$	—	3000	—	3000	pF
Output Capacitance	$C_{oss}$	$V_{GS}=0 \text{ V}$	—	1500	—	1500	
Reverse Transfer Capacitance	$C_{rss}$	$f=1 \text{ MHz}$	—	600	—	600	
Turn-On Delay Time	$t_d(on)$	$V_{DD}=50 \text{ V}$	45(typ)	100	45(typ)	100	ns
Rise Time	$t_r$	$I_D=17.5 \text{ A}$	225(typ)	450	225(typ)	450	
Turn-Off Delay Time	$t_d(off)$	$R_{gen}=R_{gs}=50 \Omega$	240(typ)	450	240(typ)	450	
Fall Time	$t_f$	$V_{GS}=10 \text{ V}$	165(typ)	350	165(typ)	350	
Thermal Resistance Junction-to-Case	$R\theta_{JC}$	RFK35N08, RFK35N10 Series	—	0.83	—	0.83	$^\circ\text{C/W}$

## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFK35N08		RFK35N10		
			MIN.	MAX.	MIN.	MAX.	
Diode Forward Voltage	$V_{SD}^a$	$I_{SD}=17.5 \text{ A}$	—	1.4	—	1.4	V
Reverse Recovery Time	$t_{rr}$	$I_F=4 \text{ A}$ $d_F/d_I=100 \text{ A}/\mu\text{s}$	200(typ)		200(typ)		ns

<sup>a</sup>Pulsed: Pulse duration = 300  $\mu\text{s}$  max., duty cycle = 2%.

RFK35N08, RFK35N10

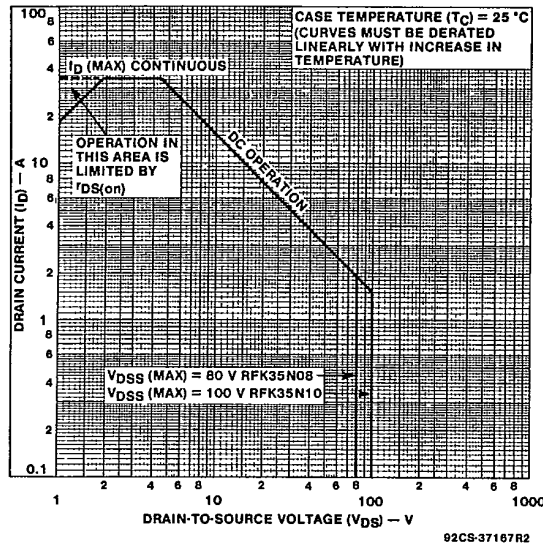


Fig. 1 — Maximum safe operating areas for all types.

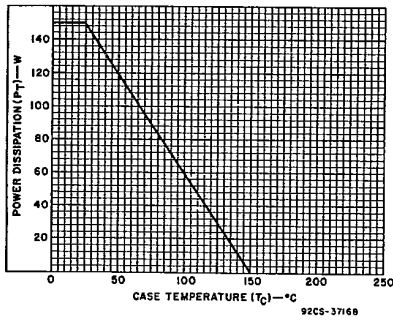


Fig. 2 — Power vs. temperature derating curve for all types.

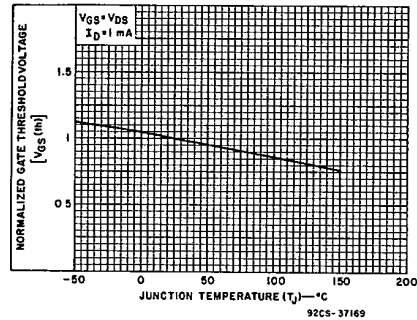


Fig. 3 — Typical normalized gate threshold voltage as a function of junction temperature for all types.

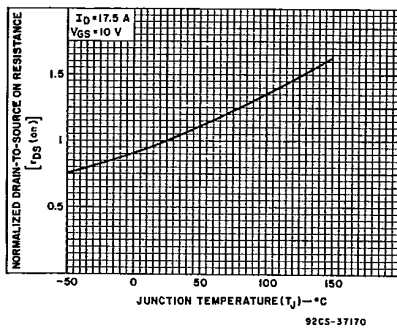


Fig. 4 — Normalized drain-to-source on resistance to junction temperature for all types.

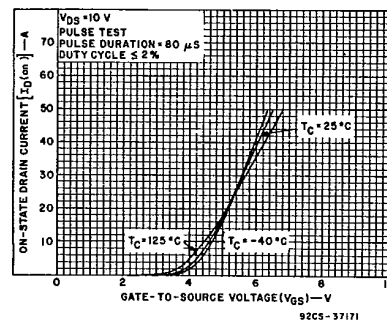


Fig. 5 — Typical transfer characteristics for all types.