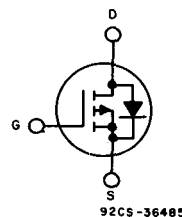


RFM8P08, RFM8P10, RFP8P08, RFP8P10File Number **1496****P-Channel Enhancement-Mode
Power Field-Effect Transistors**

8 A, -80 V and -100 V

 $r_{DS(on)} = 0.4 \Omega$ **Features:**

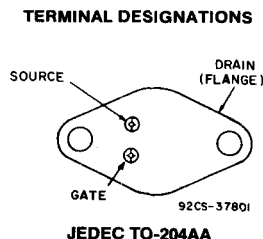
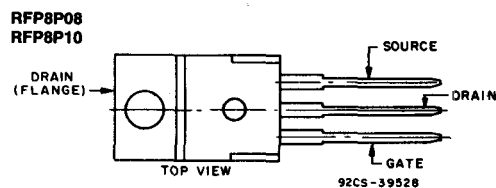
- SOA is power-dissipation limited
- Nanosecond switching speeds
- Linear transfer characteristics
- High input impedance
- Majority carrier device

**P-CHANNEL ENHANCEMENT MODE**

The RFM8P08 and RFM8P10 and the RFP8P08 and RFP8P10* are p-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 RFM-types are supplied in the JEDEC TO-204AA steel package and the RFP-types in the JEDEC TO-220AB plastic package.

*The RFM and RFP series were formerly RCA developmental numbers TA9410 and TA9411, respectively.

**RFM8P08
RFM8P10**
**JEDEC TO-204AA****JEDEC TO-220AB****MAXIMUM RATINGS, Absolute-Maximum Values ($T_C=25^\circ\text{C}$):**

	RFM8P08	RFM8P10		RFP8P08	RFP8P10	
DRAIN-SOURCE VOLTAGE	V_{DS}	-80	-100	-80	-100	V
DRAIN-GATE VOLTAGE ($R_{DS}=1\text{ M}\Omega$)	V_{DGR}	-80	-100	-80	-100	V
GATE-SOURCE VOLTAGE	V_{GS}		± 20			V
DRAIN CURRENT, RMS Continuous	I_D		8			A
Pulsed	I_{DM}		20			A
POWER DISSIPATION @ $T_C=25^\circ\text{C}$	P_T	100	100	75	75	W
Derate above $T_C=25^\circ\text{C}$		0.8	0.8	0.6	0.6	W/ $^\circ\text{C}$
OPERATING AND STORAGE						
TEMPERATURE	T_j, T_{stg}		-55 to +150			$^\circ\text{C}$

RFM8P08, RFM8P10, RFP8P08, RFP8P10**ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C)=25°C unless otherwise specified.**

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFM8P08 RFP8P08		RFM8P10 RFP8P10		
			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}	$V_{DS}=-65\text{ V}$ $V_{GS}=-80\text{ V}$	—	1	—	—	μA
		$T_C=125^\circ\text{ C}$ $V_{DS}=-65\text{ V}$ $V_{GS}=-80\text{ V}$	—	50	—	50	
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{ V}$ $V_{DS}=0$	—	100	—	100	nA
Drain-Source On Voltage	$V_{DS(on)}^a$	$I_D=4\text{ A}$ $V_{GS}=-10\text{ V}$	—	-1.6	—	-1.6	V
		$I_D=8\text{ A}$ $V_{GS}=-10\text{ V}$	—	-4.0	—	-4.0	
Static Drain-Source On Resistance	$r_{DS(on)}^a$	$I_D=4\text{ A}$ $V_{GS}=-10\text{ V}$	—	.4	—	.4	Ω
Forward Transconductance	g_{fs}^a	$V_{DS}=-10\text{ V}$ $I_D=4\text{ A}$	2	—	2	—	mho
Input Capacitance	C_{iss}	$V_{DS}=25\text{ V}$	—	1500	—	1500	pF
Output Capacitance	C_{oss}	$V_{GS}=0\text{ V}$	—	700	—	700	
Reverse Transfer Capacitance	C_{rss}	$f=1\text{ MHz}$	—	300	—	300	
Turn-On Delay Time	$t_d(on)$	$V_{DD}=50\text{ V}$	18(typ)	60	18(typ)	60	ns
Rise Time	t_r	$I_D=4\text{ A}$	70(typ)	150	70(typ)	150	
Turn-Off Delay Time	$t_d(off)$	$R_{gen}=R_{gs}=50\text{ }\Omega$	166(typ)	275	166(typ)	275	
Fall Time	t_f	$V_{GS}=-10\text{ V}$	94(typ)	175	94(typ)	175	
Thermal Resistance Junction-to-Case	$R\theta_{JC}$	RFM8P08, RFM8P10	—	1.25	—	1.25	$^\circ\text{C/W}$
		RFP8P08, RFP8P10	—	1.67	—	1.67	

*Pulsed: Pulse duration = 300 μs max., duty cycle = 2%.**SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS**

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS							
CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFM8P08 RFP8P08		RFM8P10 RFP8P10		
			Min.	Max.	Min.	Max.	
Diode Forward Voltage	V _{SD}	I _{SD} = 4A	—	1.4	—	1.4	V
Reverse Recovery Time	t _{rr}	I _F = 4A dI _F /dt = 100A/μs	200(typ.)		200(typ.)		ns

*Pulse Test: Width $\leq 300\text{ }\mu\text{s}$, Duty Cycle $\leq 2\%$.

RFM8P08, RFM8P10, RFP8P08, RFP8P10

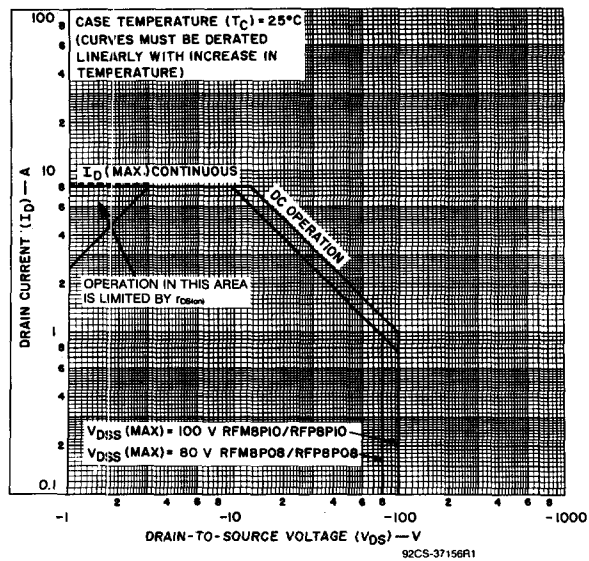


Fig. 1 — Maximum operating areas for all types.

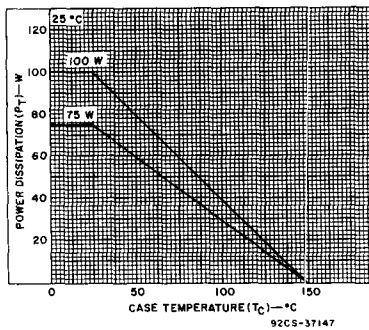


Fig. 2 — Power dissipation vs. case temperature derating curve for all types.

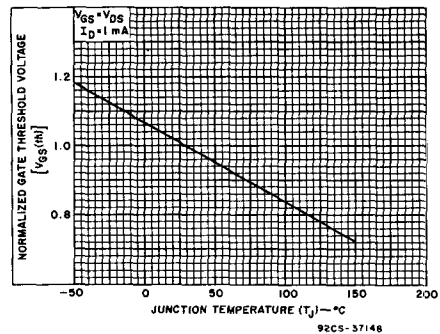


Fig. 3 — Typical normalized gate threshold voltage as a function of junction temperature for all types.

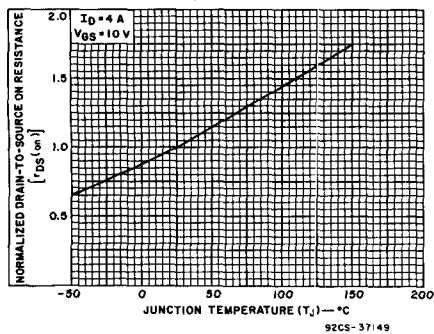


Fig. 4 — Normalized drain-to-source on resistance to junction temperature for all types.

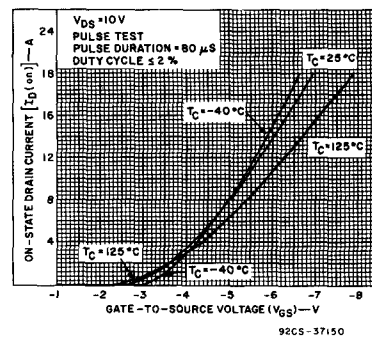


Fig. 5 — Typical transfer characteristics for all types.

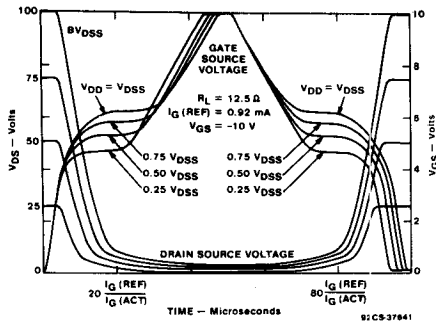
RFM8P08, RFM8P10, RFP8P08, RFP8P10

Fig. 6 - Normalized switching waveforms for constant gate-current.
Refer to RCA application notes AN-7254 and AN-7260.

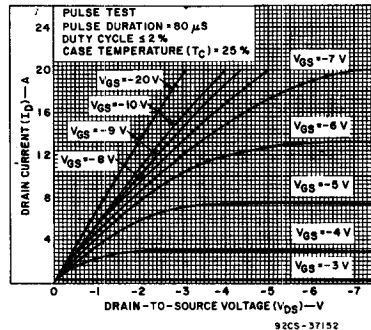


Fig. 7 — Typical saturation characteristics for all types.

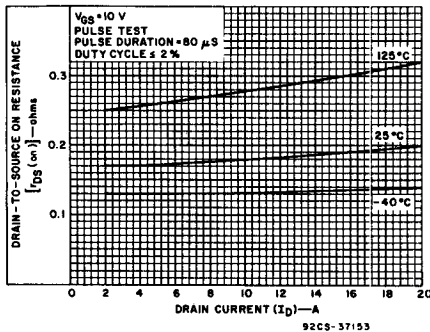


Fig. 8 — Typical drain-to-source on resistance as a function of drain current for all types.

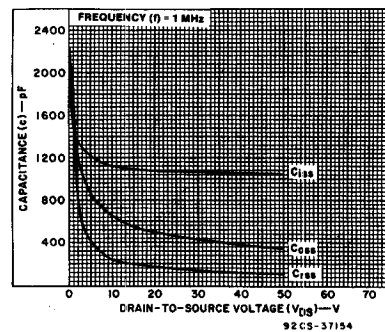


Fig. 9 — Capacitance as a function of drain-to-source voltage for all types.

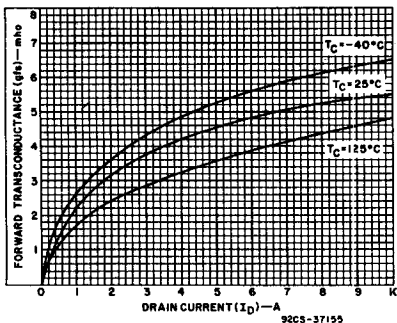


Fig. 10 — Typical forward transconductance as a function of drain current for all types.

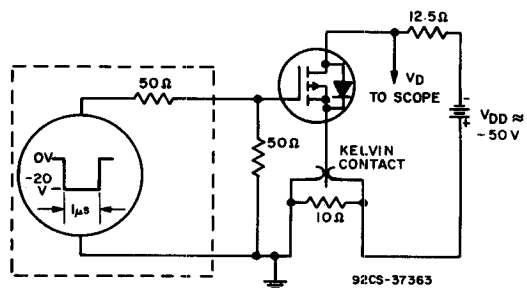


Fig. 11 — Switching Time Test Circuit.