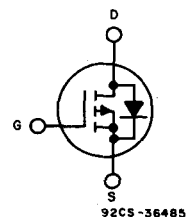


RFM6P08, RFM6P10, RFP6P08, RFP6P10File Number **1490****P-Channel Enhancement-Mode
Power Field-Effect Transistors**

6 A, 80 V — 100 V

 $r_{DS(on)} = 0.6 \Omega$ **Features:**

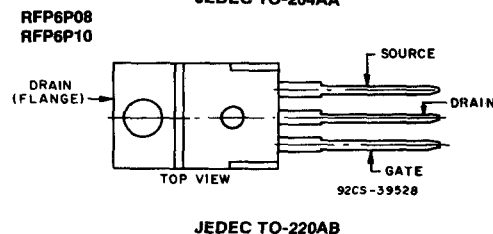
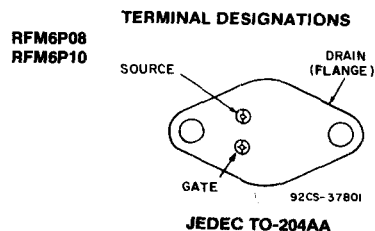
- SOA is power-dissipation limited
- Nanosecond switching speeds
- Linear transfer characteristics
- High input impedance
- Majority carrier device

**P-CHANNEL ENHANCEMENT MODE**

The RFM6P08 and RFM6P10 and the RFP6P08 and RFP6P10* are P-Channel enhancement-mode silicon-gate power field-effect transistors designed for high-speed applications such as switching regulators, switching converters, relay drivers, and drivers for high-power bipolar switching transistors.

The RFM-Series types are supplied in the JEDEC TO-204AA metal package and the RFP-Series types in the JEDEC TO-220AB plastic package. All these types are supplied without an internal gate Zener diode.

*The RFM and RFP series were formerly RCA developmental numbers TA9406 and TA9407, respectively.

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

	RFM6P08	RFM6P10		RFP6P08	RFP6P10	
DRAIN-SOURCE VOLTAGE	80	100		80	100	V
DRAIN-GATE VOLTAGE ($R_{GS}=1\text{ M}\Omega$) ...	80	100		80	100	V
GATE-SOURCE VOLTAGE			± 20			V
DRAIN CURRENT, RMS Continuous			6			A
Pulsed			20			A
POWER DISSIPATION @ $T_c=25^\circ\text{C}$	75	75		60	60	W
Derate above $T_c=25^\circ\text{C}$	0.6	0.6		0.48	0.48	W/ $^\circ\text{C}$
OPERATING AND STORAGE						
TEMPERATURE			-55 to +150			$^\circ\text{C}$

RFM6P08, RFM6P10, RFP6P08, RFP6P10**ELECTRICAL CHARACTERISTICS, At Case Temperature (T_C)=25°C unless otherwise specified.**

CHARACTERISTICS	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFM6P08 RFP6P08		RFM6P10 RFP6P10		
			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}	$V_{DS}=-65\text{ V}$ $V_{DS}=-80\text{ V}$	—	1	—	—	μA
		—	—	—	1		
		$T_C=125^\circ\text{C}$ $V_{DS}=-65\text{ V}$ $V_{DS}=-80\text{ V}$	—	50	—	—	
		—	—	—	50		
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{ V}$ $V_{DS}=0$	—	100	—	100	nA
Drain-Source On Voltage	$V_{DS(on)}^a$	$I_D=3\text{ A}$ $V_{GS}=-10\text{ V}$	—	-1.8	—	-1.8	V
		$I_D=6\text{ A}$ $V_{GS}=-10\text{ V}$	—	-6	—	-6	
Static Drain-Source On Resistance	$r_{DS(on)}^a$	$I_D=3\text{ A}$ $V_{GS}=-10\text{ V}$	—	0.6	—	0.6	Ω
Forward Transconductance	g_{fs}^a	$V_{DS}=10\text{ V}$ $I_D=3\text{ A}$	1	—	1	—	mho
Input Capacitance	C_{iss}	$V_{DS}=25\text{ V}$	—	800	—	800	pF
Output Capacitance	C_{oss}	$V_{GS}=0\text{ V}$	—	350	—	350	
Reverse Transfer Capacitance	C_{rss}	$f=1\text{ MHz}$	—	150	—	150	
Turn-On Delay Time	$t_d(on)$	$V_{DD}=50\text{ V}$	11(typ)	60	11(typ)	60	ns
Rise Time	t_r	$I_D=3\text{ A}$	48(typ)	100	48(typ)	100	
Turn-Off Delay Time	$t_d(off)$	$R_{gen}=R_{gs}=50\text{ }\Omega$	102(typ)	150	102(typ)	150	
Fall Time	t_f	$V_{GS}=10\text{ V}$	70(typ)	100	70(typ)	100	
Thermal Resistance Junction-to-Case	$R\theta_{JC}$	RFM6P08, RFM6P10	—	1.67	—	1.67	$^\circ\text{C/W}$
		RFP6P08, RFP6P10	—	2.083	—	2.083	

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

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	LIMITS				UNITS
			RFM6P08 RFP6P08		RFM6P10 RFP6P10		
			MIN.	MAX.	MIN.	MAX.	
Diode Forward Voltage	V _{SD}	I _{SD} =3 A	—	1.4	—	1.4	V
Reverse Recovery Time	t _{rr}	I _F =4 A dI _F /dt=50 A/μs	150(typ)		150(typ)		ns

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

RFM6P08, RFM6P10, RFP6P08, RFP6P10

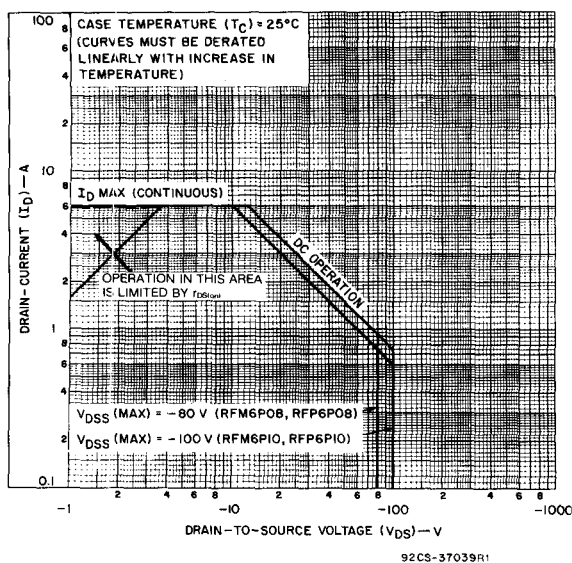


Fig. 1 — Maximum safe operating areas for all types.

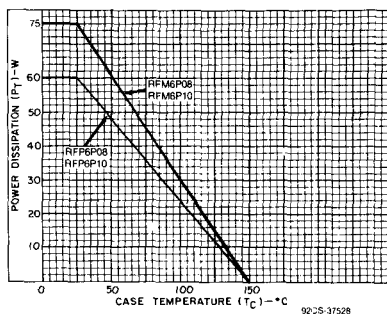


Fig. 2 — Power dissipation vs. temperature derating curve for all types.

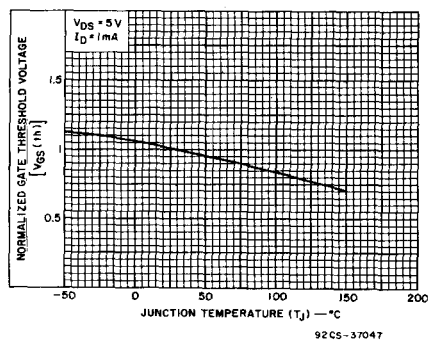


Fig. 3 — Typical normalized gate threshold voltage as a function of junction temperature for all types.

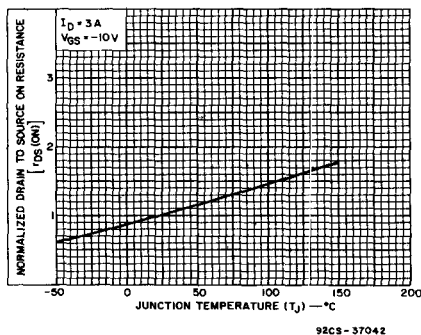


Fig. 4 — Normalized drain-to-source on resistance to junction temperature for all types.

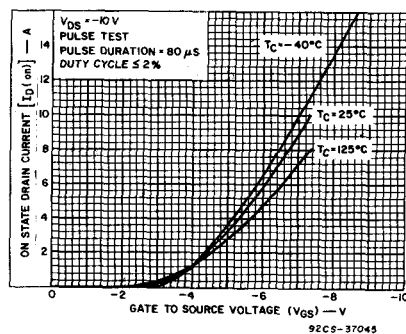


Fig. 5 — Typical transfer characteristics for all types.

RFM6P08, RFM6P10, RFP6P08, RFP6P10

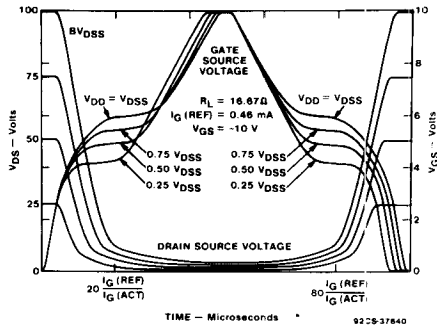


Fig. 6 — Normalized switching waveforms for constant gate-current. Refer to RCA application notes AN-7254 and AN-7260.

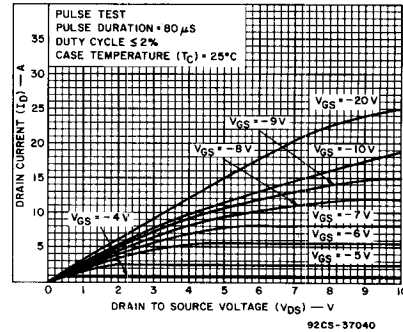


Fig. 7 — Typical saturation characteristics for all types.

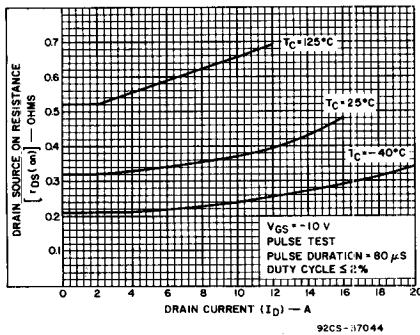


Fig. 8 — Typical drain-to-source on resistance as a function of drain current for all types.

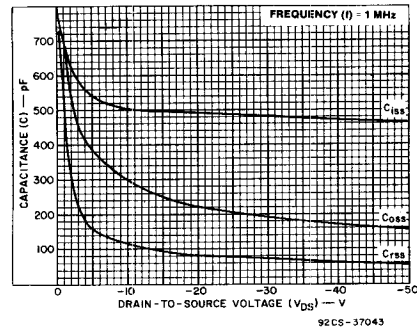


Fig. 9 — Capacitance as a function of drain-to-source voltage for all types.

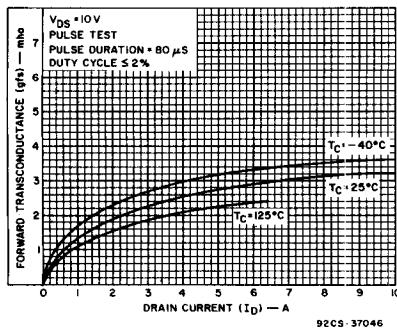


Fig. 10 — Typical forward transconductance as a function of drain current for all types.

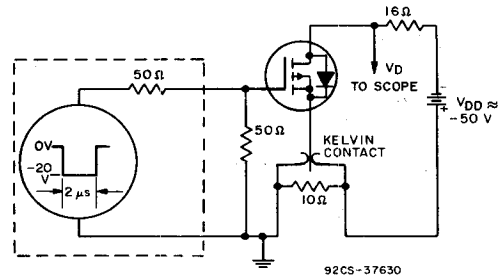


Fig. 11 — Switching Time Test Circuit.