

RFM12N18/12N20 RFP12N18/12N20

N-Channel Enhancement Mode
Power Field Effect Transistors

August 1991

Features

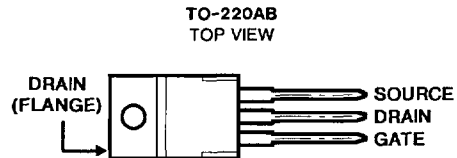
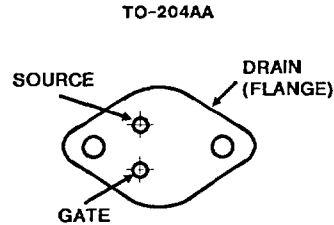
- 12A, 180V and 200V
- $r_{DS(on)} = 0.25\Omega$
- SOA is Power-Dissipation Limited
- Nanosecond Switching Speeds
- Linear Transfer Characteristics
- High Input Impedance
- Majority Carrier Device

Description

The RFM12N18 and RFM12N20 and the RFP12N18 and RFP12N20 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.

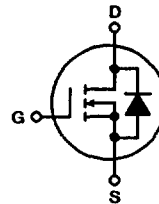
The RFM-types are supplied in the JEDEC TO-204AA steel package and the RFP-series types in the JEDEC TO-220AB plastic package.

Packages



Terminal Diagram

N-CHANNEL ENHANCEMENT MODE



Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$), Unless Otherwise Specified

	RFM12N18	RFM12N20	RFP12N18	RFP12N20	UNITS
Drain-Source Voltage	V_{DSS} 180	200	180	200	V
Drain-Gate Voltage ($R_{GS} = 1\text{m}\Omega$)	V_{DGR} 180	200	180	200	V
Continuous Drain Current					
RMS Continuous	I_D 12	12	12	12	A
Pulsed Drain Current	I_{DM} 30	30	30	30	A
Gate-Source Voltage	V_{GS} ± 20	± 20	± 20	± 20	V
Maximum Power Dissipation					
$T_C = +25^\circ\text{C}$	P_D 100	100	75	75	W
Above $T_C = +25^\circ\text{C}$, Derate Linearly	0.8	0.8	0.6	0.6	W/ $^\circ\text{C}$
Operating and Storage Junction	T_J, T_{STG} -55 to +150	-55 to +150	-55 to +150	-55 to +150	$^\circ\text{C}$
Temperature Range					

RFM12N18, RFM12N20, RFP12N18, RFP12N20

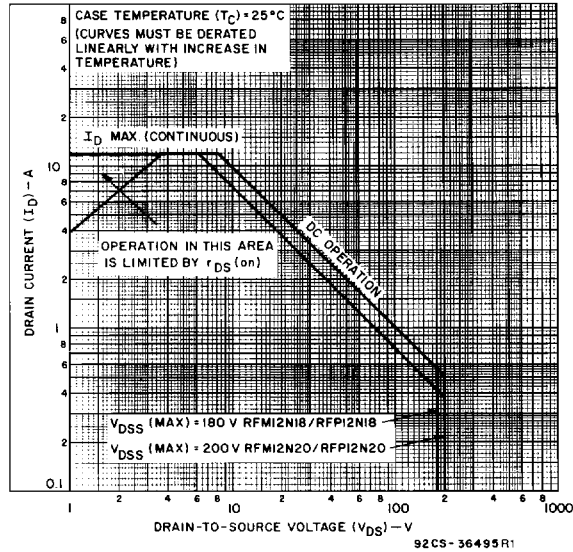


Fig. 1 - Maximum safe operating areas for all types.

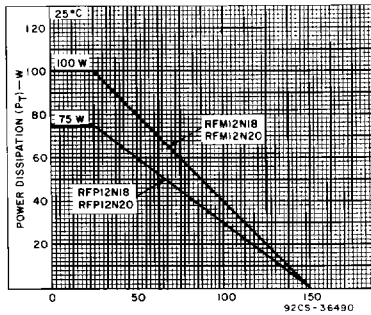


Fig. 2 - Power dissipation vs. case temperature derating curve for all types.

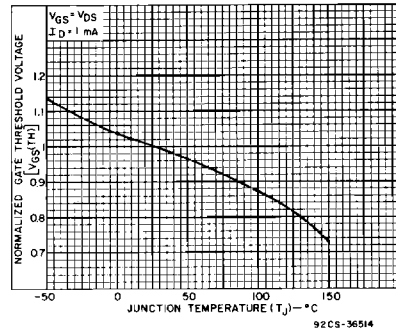


Fig. 3 - Typical normalized gate threshold voltage as a function of junction temperature for all types.

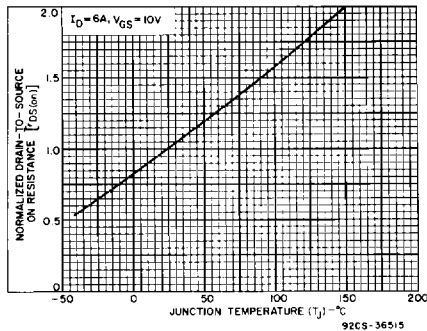


Fig. 4 - Normalized drain-to-source on resistance as a function of junction temperature for all types.

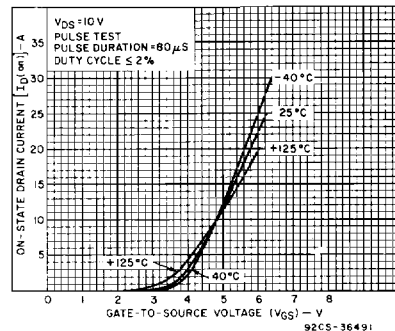


Fig. 5 - Typical transfer characteristics for all types.

RFM12N18, RFM12N20, RFP12N18, RFP12N20

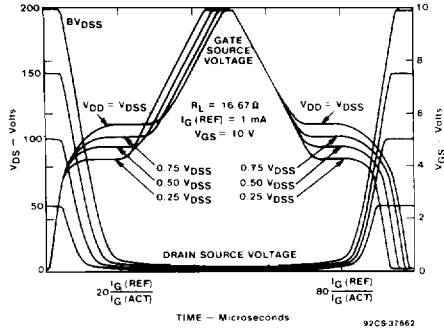


Fig. 6 - Normalized switching waveforms for constant gate-current. Refer to Harris application notes AN-7254 and AN-7260

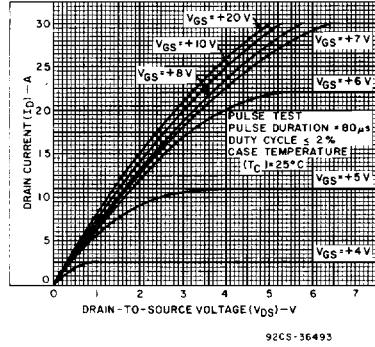


Fig. 7 - Typical saturation characteristics for all types.

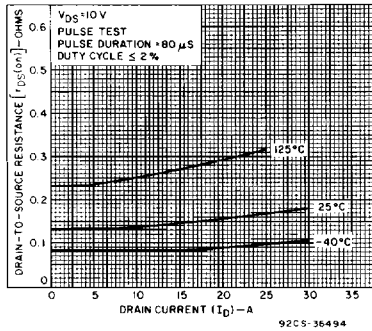


Fig. 8 - Typical drain-to-source on resistance as a function of drain current for all types.

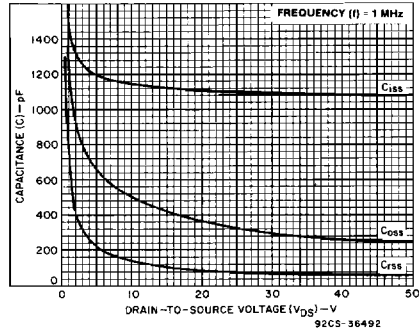


Fig. 9 - Capacitance as a function of drain-to-source voltage for all types.

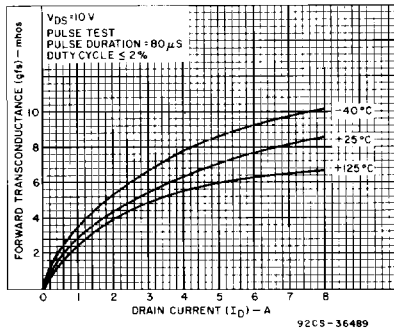


Fig. 10 - Typical forward transconductance as a function of drain current for all types.

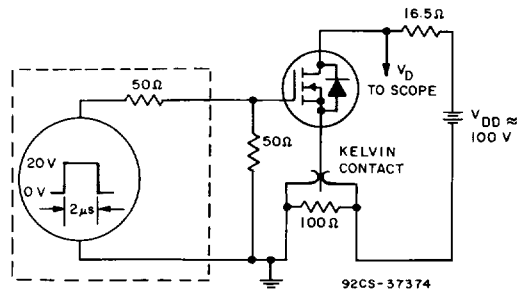


Fig. 11 - Switching Time Test Circuit