

MFE824 (SILICON)

SILICON N-CHANNEL MOS FIELD-EFFECT TRANSISTORS

Depletion-Enhancement Mode. (Type B) MOS Field-Effect Transistors designed for use in smoke detector circuits.

- Low Gate Reverse Current –
 $I_{GSS} = 1.0 \mu\text{A} (\text{Max}) @ V_{GS} = 10 \text{ Vdc}$
- High Sensitivity –
 $Y_{fs} = 1.0 \text{ mmho} (\text{Min}) @ V_{DS} = 10 \text{ Vdc}$

N-CHANNEL MOS FIELD-EFFECT TRANSISTORS



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	Vdc
Gate-Source Voltage	V_{GS}	± 10	Vdc
Drain Current	I_D	30	mA
Total Power Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	300 1.71	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

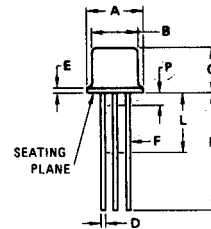
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	584	$^\circ\text{C/W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	250	$^\circ\text{C/W}$

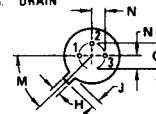
HANDLING PRECAUTIONS:

MOS field-effect transistors have extremely high input resistance. They can be damaged by the accumulation of excess static charge. Avoid possible damage to the devices while handling, testing, or in actual operation, by following the procedures outlined below:

1. To avoid the build-up of static charge, the leads of the devices should remain shorted together with a metal ring except when being tested or used.
2. Avoid unnecessary handling. Pick up devices by the case instead of the leads.
3. Do not insert or remove devices from circuits with the power on because transient voltages may cause permanent damage to the devices.



STYLE 2
PIN 1. SOURCE, SUBSTRATE, CASE
2. GATE
3. DRAIN



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.31	5.84	0.209	0.230
B	4.52	4.95	0.178	0.195
C	4.32	5.33	0.170	0.210
D	0.406	0.533	0.016	0.021
E	—	0.762	—	0.030
F	0.406	0.483	0.016	0.019
G	2.54 BSC		0.100 BSC	
H	0.914	1.17	0.036	0.046
J	0.711	1.22	0.028	0.048
K	12.70	—	0.500	—
L	6.35	—	0.250	—
M	45° BSC		45° BSC	
N	1.27 BSC		0.050 BSC	
P	—	1.27	—	0.050

All JEDEC notes and dimensions apply.

CASE 22-03
(TO-18)

MFE824 (continued)

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage ($I_C = 1.0 \mu\text{A}$, $V_{GS} = -8.0 \text{ Vdc}$)	$V_{(BR)DSX}$	20	—	Vdc
Gate-Source Voltage ($V_{DS} = 10 \text{ Vdc}$, $I_D = 1.0 \text{ nA}$)	V_{GS}	—	-6.0	Vdc
Gate Reverse Current ($V_{GS} = 10 \text{ Vdc}$, $V_{DS} = 0$)	I_{GSS}	—	1.0	pA
ON CHARACTERISTICS				
Zero-Gate Voltage Drain Current ($V_{DS} = 10 \text{ Vdc}$, $V_{GS} = 0$)	I_{DSS}	1.0	15	mA
SMALL-SIGNAL CHARACTERISTICS				
Forward Transfer Admittance ($V_{DS} = 10 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ kHz}$)	Y_{fs}	1.0	4.0	mmhos
Input Capacitance ($V_{DS} = 10 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ MHz}$)	C_{iss}	—	4.0	pF
Reverse Transfer Capacitance ($V_{DS} = 10 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ MHz}$)	C_{rss}	—	0.7	pF
Output Capacitance ($V_{DS} = 10 \text{ Vdc}$, $V_{GS} = 0$, $f = 1.0 \text{ MHz}$)	C_{oss}	—	2.5	pF