

Electromechanical vs. Solid State Relay Characteristics Comparison

Characteristics	EMR	SSR	Comment
Sensitivity to withstand misuse or misapplication	Good	Poor	1
Sensitive to corrosion, oxidation, or contaminants	Yes	No	2
Sensitive to shock, vibration or acceleration	Yes	No	
Sensitivity to radiation	Fair	Poor	2
Package versatility	Good	Fair	???
Cost per pole	Best	Fair	2
Input TTL & CMOS (buffer) compatibility	Fair	Best	
Operate and release time	5-20 mS	.005-10ms	
Ease of troubleshooting	Good	Poor	???
Input to output isolation capability	4Kv	>4Kv	???
Normal failure mode (output)	Open	Shorted	???
Normal wearout mechanism	Contacts	LED	Not true
Physical size per pole	Best	Fair	2
Available output contact forms	???	???	
Multipole capability from single input	Yes	Some	???
Electrical life expectancy (operations)	>100K	>100 Million	???
Capable of rapid duty cycle switching	Some	All	
Capable of AC & DC voltage switching	Yes	Some	2
Capable of inductive load switching	Yes	Yes	
Capable of resistive load switching	Yes	Yes	
Capable of capacitive load switching	Yes	Yes	
Capable of low level load switching	Yes	Some	2
Capable of dry circuit load switching	Yes	No	???
Capable of coaxial load (RF) switching	Yes	No	2
Capable of precision synchronous switching	No	Yes	
Capable of zero voltage turn-on/zero current turn-off	No	Yes	???
Output contact off-state resistance	>1 M ohms	>20K ohms	???
Output contact on-state resistance	<.05 ohms	<.05... ohms	
Output contact arcing	Yes	No	
Output contact bounce	Yes	No	
Level of EMI/RFI generated (emitted)	Large	Small	2
Derating of output current required above T _A =25°C	No	Yes	2
Heatsink required to switch maximum rated loads	No	Some	1
Inrush surge current capability (ref. to max. rated current)	1-5 times	2-10 times	X
On-state surge current capability (ref. to max. rated current)	1-5 times	2-10 times	X
Sensitive to explosive environment	Yes	No	2
Sensitivity to magnetic fields	Fair	Good	2
Sensitive (susceptibility) to EMI/RFI false operation	No	Yes	2
Sensitive to ESD (electrostatic discharge) turn-on	No	Yes	2
Sensitive to overvoltage turn-on	No	Yes	2
Sensitive to thermal turn-on	No	Yes	2
Sensitive to dv/dt turn-on	No	Yes	2
Sensitive to load di/dt turn-on	No	Yes	2

Comments: 1 = depend on application
 2 = true if the components chosen incorrectly
 X = no factual
 ??? = strange estimate