

FMCRZ01-80

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FMCRZ01-80

1.0A 800V Sensitive Gate Silicon Controlled Rectifiers

Features

- $V_D / V_R : 800V$, $I_{T(RMS)} : 1A$, $I_{GT} : 200\mu A$.
- Sensitive gate.
- Direct triggering from low power drivers and logic ICs.
- Surface mountable package.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMCRZ01-80-H.

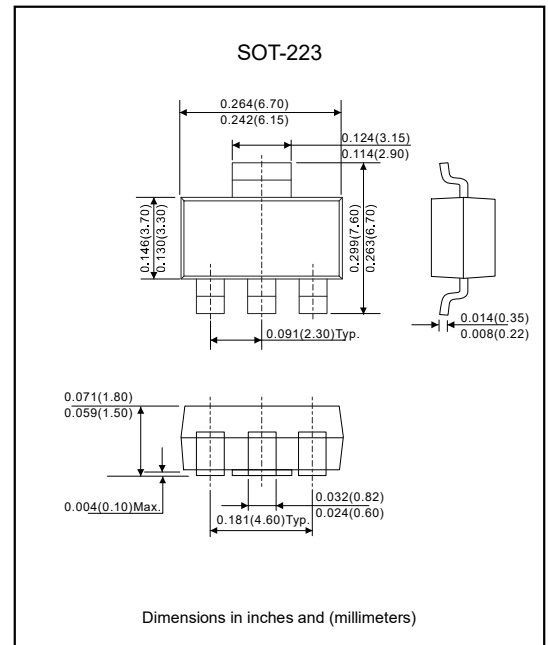
Applications

- Ground fault circuit interrupters (GFCI).
- General purpose switching and phase control.
- Ignition circuits, CDI.
- Motor control-e.g. small kitchen applications.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-223.
- Terminals : Solder plated, solder able per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



Maximum ratings (At $T_c=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Repetitive peak off-state voltage	V_{DRM}	800	V
Repetitive peak reverse voltage	V_{RRM}	800	V
RMS on-state current ($T_c=75^\circ C$)	$I_{T(RMS)}$	1	A
Non repetitive surge peak on-state current (180° conduction angle, $f=50Hz$, $t=10ms/60Hz$, 8.3ms)	I_{TSM}	12	A
I^2t value for fusing ($t_p=10ms$)	I^2t	0.72	A ² S
Critical rate of rise of on-state current ($I=2 \times I_{GT}$, $t_r \leq 100ns$)	di/dt	50	A/ μ S
Peak gate current	I_{GM}	0.5	A
Average gate power dissipation	$P_{G(AV)}$	0.1	W
Thermal resistance, junction to case (DC)	$R_{\theta JC}$	25	$^\circ C/W$
ESD Level	HBM	Class 3 (4K ~ 16K)	
Humidity sensitive level	MSL	Three - Level (30 $^\circ C$, 60%RH, 168h)	
Device temperature for soldering purposes (for 10 seconds maximum)	T_L	260	$^\circ C$
Operating junction temperature	T_J	+125	$^\circ C$
Storage junction temperature range	T_{STG}	-40 to +150	$^\circ C$

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Electrical characteristics (T_C=25°C unless otherwise specified)

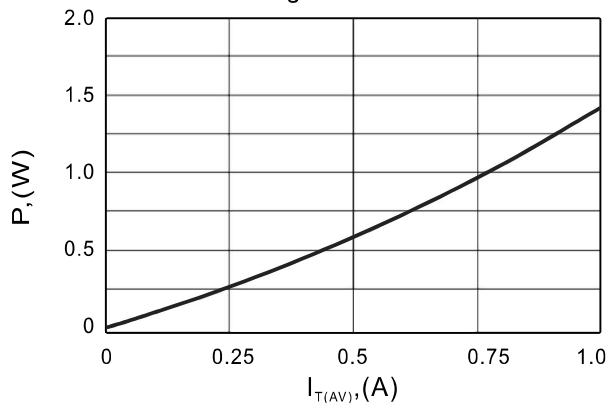
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate trigger current	I _{GT}	V=12V, R=140Ω	20	40	120	μA
Gate trigger voltage	V _{GT}				1	V
Gate Non-trigger voltage	V _{GD}	V _D =V _{DRM} , T _J =125°C, R=1KΩ	0.2			V
Latching current	I _L	I _G =1.2I _{GT}			6	mA
Holding current	I _H	I _T =50mA			5	mA
Critical rate of rise of off-state voltage	dv/dt	V _D =2/3V _{DRM} gate open, T _J =125°C	50			V/μs

Static characteristics

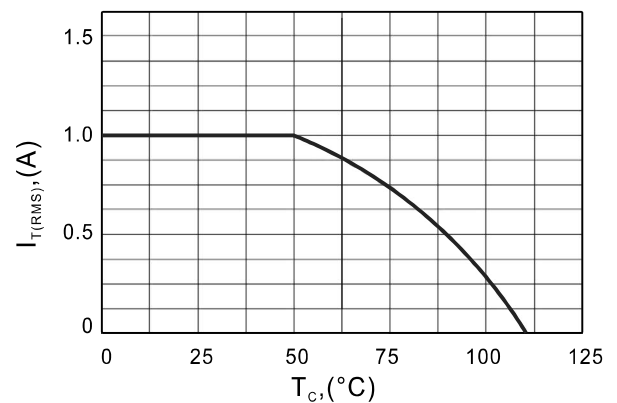
Peak on-state voltage	V _{TM}	I _{TM} =2A, t _p =380μs (T _J =25°C)			1.7	V
Repetitive peak off-state current	I _{DRM}	V _D =V _{DRM} , V _R =V _{RRM} (T _J =25°C)			10	μA
Repetitive peak reverse current	I _{RRM}				0.5	mA

Rating and characteristic curves

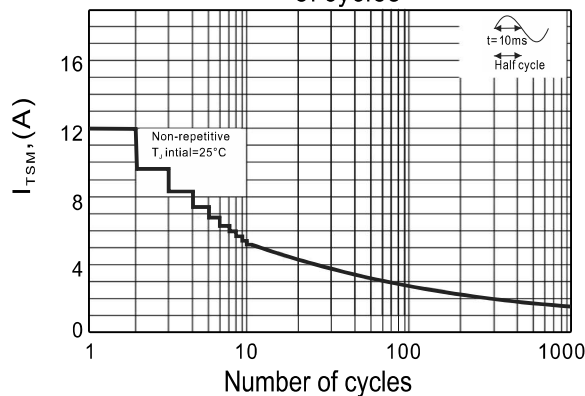
Maximum power dissipation vs.
Average on-state current



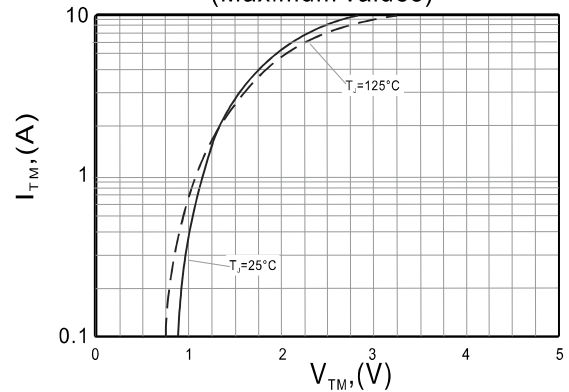
On-state current vs. Case temperature



Surge peak on-state current vs. Number of cycles



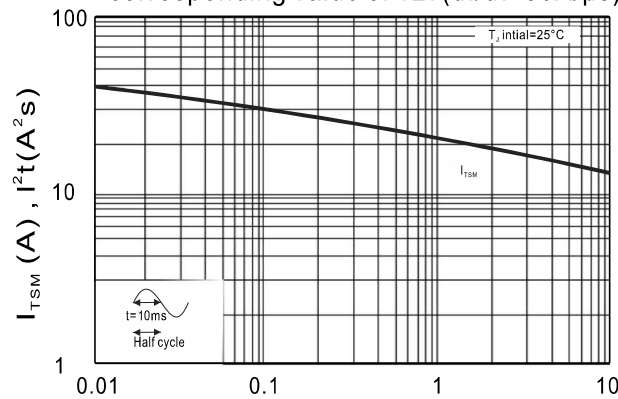
On-state current characteristics
(Maximum values)



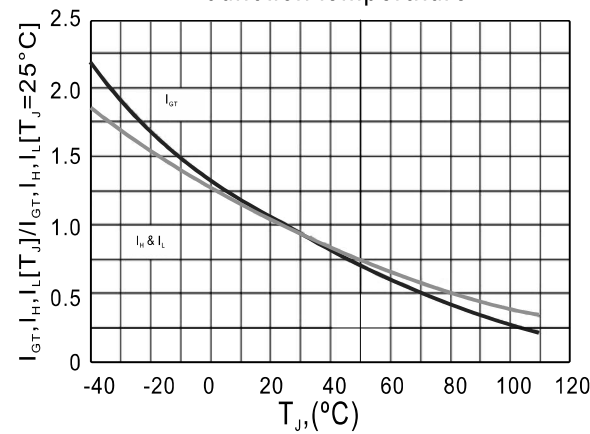
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Rating and characteristic curves

Non-repetitive surge peak on-state current for a sinusoidal pulse with width $t_p < 10$, and corresponding value of $12t$ ($dI/dt < 50A/\mu s$)



Relative variations of gate trigger current holding current and latching current vs. Junction temperature



Pinning information

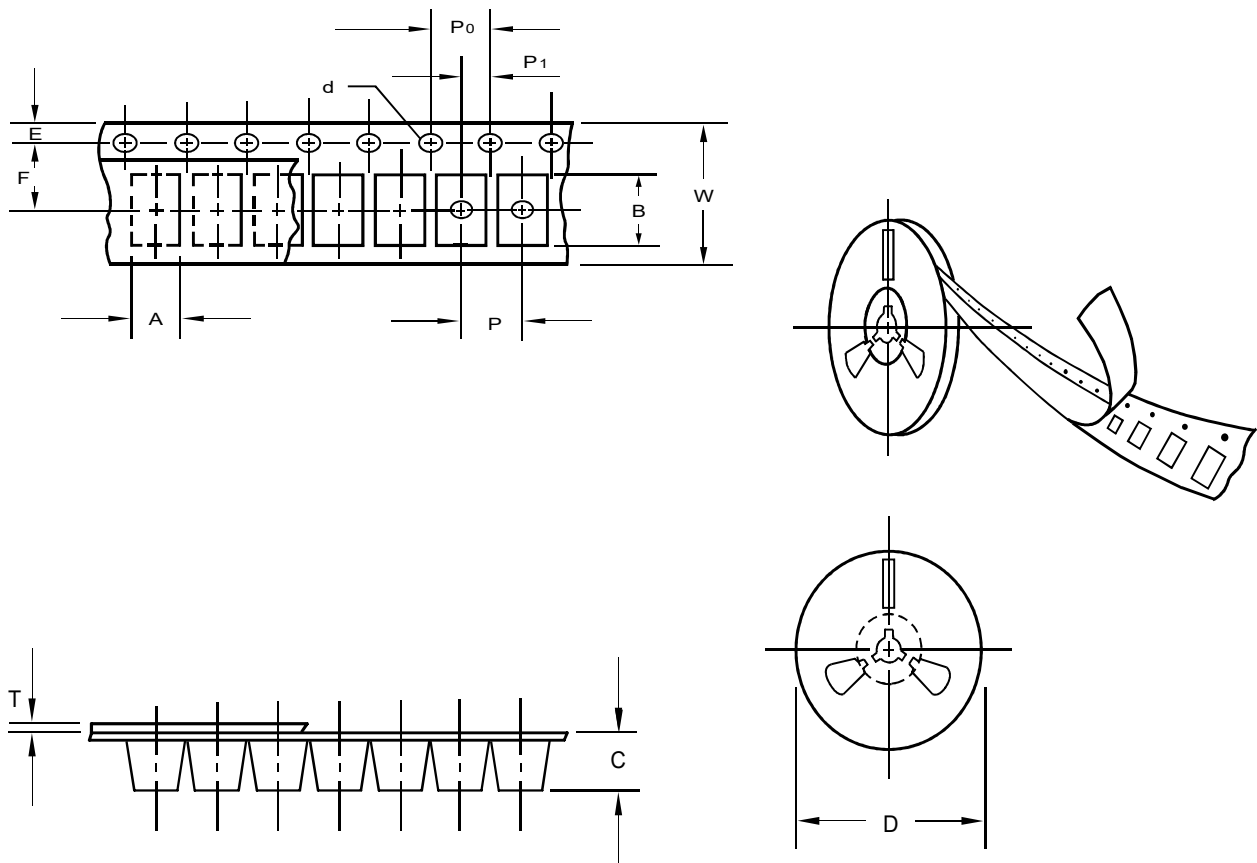
Pin	Simplified outline	Symbol
Pin1 K Pin2 A Pin3 G		

Marking

Type number	Marking code
FMCRZ01-80	S0102-8U

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-223
Carrier width	A	0.2	6.90
Carrier length	B	0.2	7.30
Carrier depth	C	0.2	1.88
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.50
Punch hole pitch	P	0.1	8.00
Sprocket hole pitch	P ₀	0.1	4.00
Embossment center	P ₁	0.1	2.00
Overall tape thickness	T	0.1	0.25
Tape width	W	0.5	12.00

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

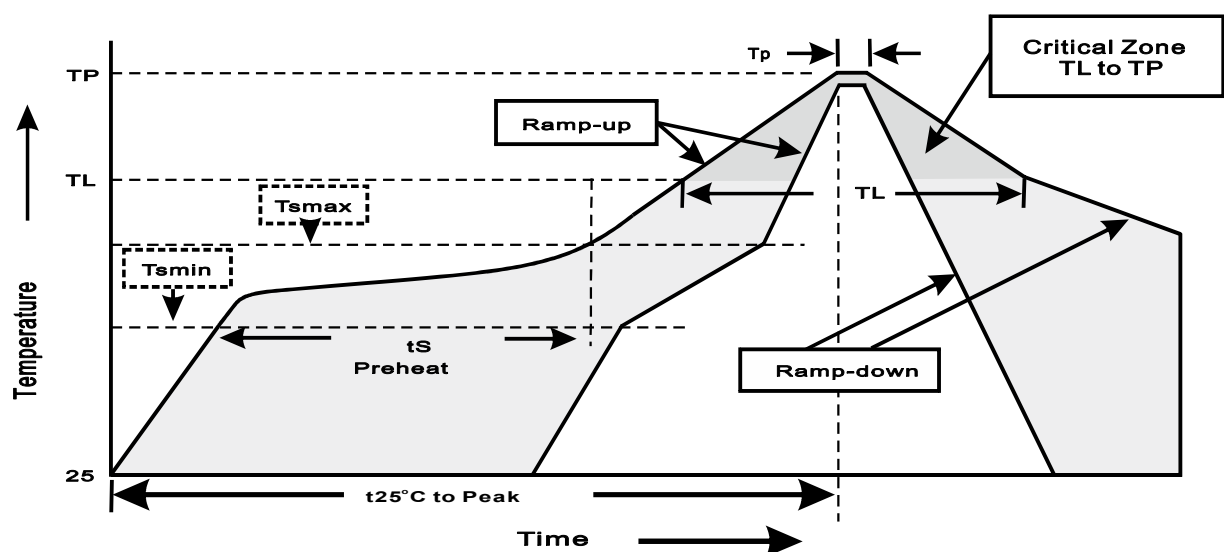
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
SOT-223	13"	2,500	8.0	5,000	335*335*38	330	350*330*360	40,000

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature=5°C~40°C Humidity=55%±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile Feature	Soldering Condition
Average ramp-up rate(T _L to T _P)	<3°C/sec
Preheat -Temperature Min(T _{sm}) -Temperature Max(T _{smax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<3°C/sec
Time 25°C to Peak Temperature	<6minutes