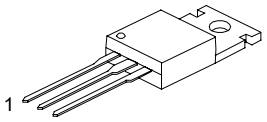
UTC US108S/N SCR

SCRs

DESCRIPTION

The UTC US108S/N is suitable to fit all modes of control, found in applications such as overvoltage crowbar protection, motor control circuits in power tools and kitchen aids, inrush current limiting circuits, capacitive discharge ignition and voltage regulation circuits.



TO-220

1: CATHODE 2: ANODE 3: GATE

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATING		UNIT
		US108S	US108N	
Repetitive peak off-state voltages US108S/N-4 US108S/N-6 US108S/N-8	V_{DRM} V_{RRM}	400 600 800		V
RMS on-state current (180° conduction angle) (Tc = 110°C)	$I_{T(RMS)}$	8		A
Average on-state current (180° conduction angle) (Tc = 110°C)	$I_{T(AV)}$	5		A
Non repetitive surge peak on-state current (Tj = 25°C) tp=8.3ms tp=10ms	I_{TSM}	73 70	100 95	A
I^2t Value for fusing (tp = 10 ms ,Tj = 25°C)	I^2t	24.5	45	A^2S
Critical rate of rise of on-state current (IG = 2 x IGT , tr ≤ 100 n s, Tj = 125°C, F = 60 Hz)	dI/dt	50		A/μs
Peak gate current (tp=20μs, Tj = 125°C)	I_{GM}	4		A
Maximum peak reverse gate voltage	V_{RGM}		5	V
Average gate power dissipation (Tj = 125°C)	$P_{G(AV)}$	1		W
Storage junction temperature range	Tstg	-40 ~ +150		°C
Operating junction temperature range	Tj	-40 ~ +125		°C

UTC US108S(SENSITIVE) ELECTRICAL CHARACTERISTICS

(Tj=25℃unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX.	UNIT
Gate trigger Current	I_{GT}	V_D = 12 V, R_L =140Ω		200	μA
Gate trigger Voltage	V_{GT}	V_D = 12 V, R_L=140Ω		0.8	V
Gate non-trigger voltage	V_{GD}	V_D = V_{DRM}, R_L = 3.3 kΩ, R_{GK} = 220Ω Tj = 125°C	0.1		V
Reverse gate voltage	V_{RG}	I_{RG} = 10 μA	8		V
Holding Current	I_H	I_T = 50 mA, R_{GK} = 1 kΩ		5	mA
Latching Current	I_L	I_G = 1 mA ,R_{GK} = 1 kΩ		6	mA
Circuit Rate Of Change Of off-state Voltage	dV/dt	V_D = 65 % V_{DRM} ,R_{GK} = 220 Ω Tj = 125°C	5		V/μs
On-state voltage	V_{TM}	I_{TM} = 16A, t_p = 380 μs Tj = 25°C		1.6	V
Threshold Voltage	V_{t0}	Tj = 125°C		0.85	V
Dynamic Resistance	R_d	Tj = 125°C		46	mΩ
Off-state Leakage Current	I_{DRM} I_{RRM}	V_{DRM} = V_{RRM}, R_{GK} = 220 Ω Tj = 25°C Tj = 125°C		5 1	μA mA

UTC US108N(STANDARD) ELECTRICAL CHARACTERISTICS

(Tj=25℃unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	MAX.	UNIT
Gate trigger Current	I_{GT}	V_D = 12 V, R_L =33Ω	2	15	mA
Gate trigger Voltage	V_{GT}	V_D = 12 V, R_L=33Ω		1.3	V
Gate non-trigger voltage	V_{GD}	V_D = V_{DRM}, R_L = 3.3 kΩ, Tj = 125°C	0.2		V
Holding Current	I_H	I_T = 100 mA, Gate open		30	mA
Latching Current	I_L	I_G = 1.2 I_{GT}		70	mA
Circuit Rate Of Change Of off-state Voltage	dV/dt	V_D = 67 % V_{DRM} , Gate open,Tj = 125°C	150		V/μs
On-state voltage	V_{TM}	I_{TM} = 16A, t_p = 380 μs, Tj = 25°C		1.6	V
Threshold Voltage	V_{t0}	Tj = 125°C		0.85	V
Dynamic Resistance	R_d	Tj = 125°C		46	mΩ
Off-state Leakage Current	I_{DRM} I_{RRM}	V_{DRM} = V_{RRM} Tj = 25°C Tj = 125°C		5 2	μA mA

THERMAL RESISTANCES

PARAMETER	SYMBOL	VALUE	UNIT
Junction to case (DC)	Rth(j-c)	20	K/W
Junction to ambient (DC)	Rth(j-a)	60	K/W

Fig.1:Maximum average power dissipation vs average on-state current

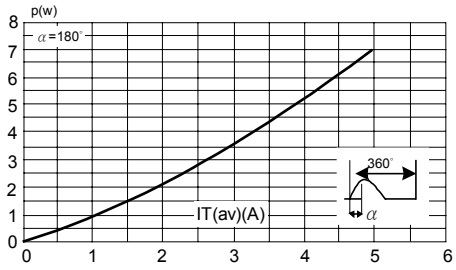


Figure.2:Average and D.C. on-state current vs case temperature

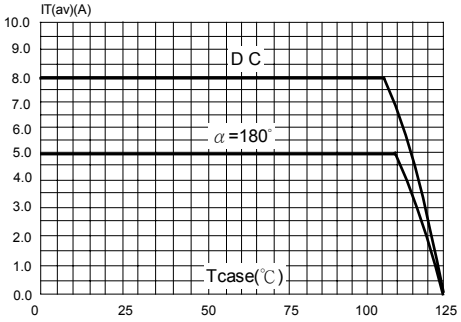


Figure.3: Relative variation of thermal impedance junctio to case vs pulse duration

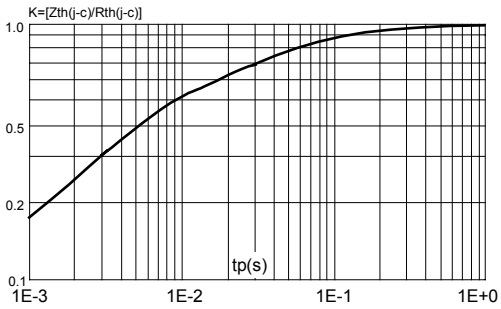


Figure.4:Relative variation of gate trigger current,holding current and latching vs junction temperature .(US108S)

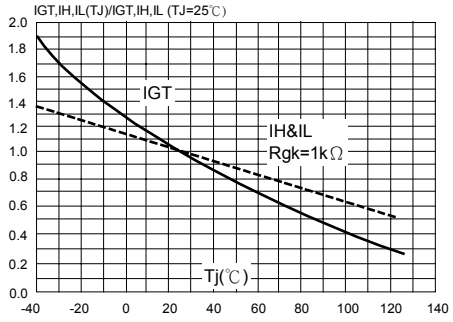


Figure.4-2:Relative variation of gate trigger current,holding current and latching vs junction temperature .(US108N)

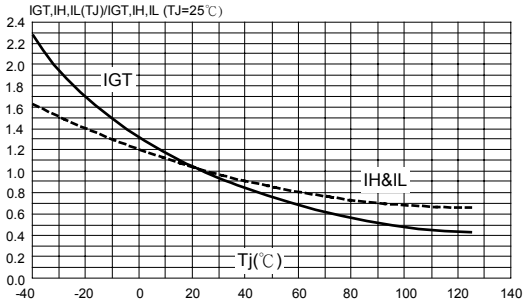


Figure.5:Relative variation of holding current vs gate-cathode resistance(typical values) (US108S)

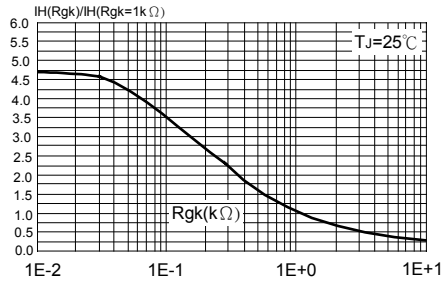


Fig.6: Relative variation of dV/dt immunity vs gate-cathode resistance(typical values) (US108S)

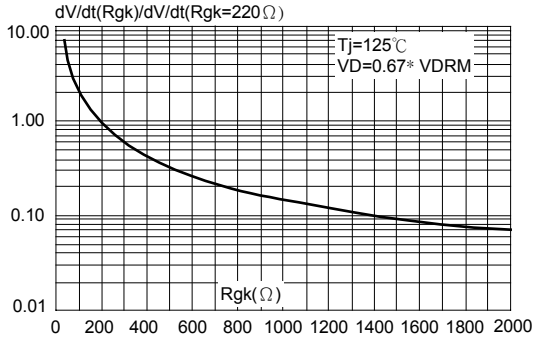


Fig.7: Relative variation of dV/dt immunity vs gate-cathode resistance(typical values) (US108S)

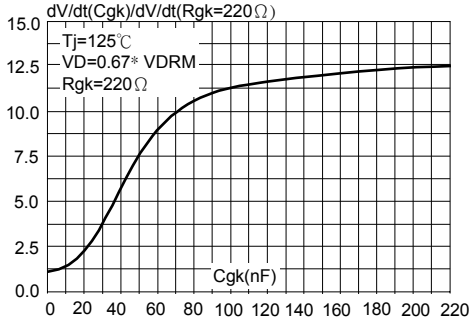


Figure.8: Surge peak on-state current vs number of cycles.

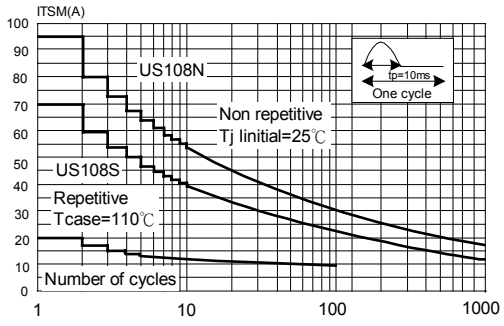


Fig.9:Non-repetitive surge peak on-state current for a sinusoidal pulse with width tp<10ms, and corresponding values of I^2t.

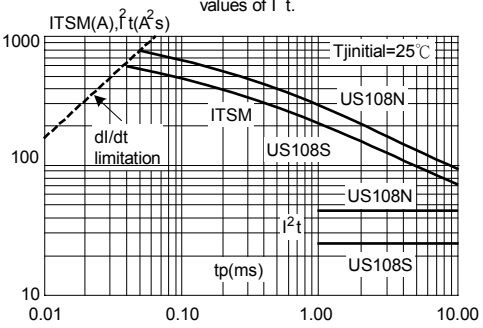


Fig.10: On-state characteristics(maximum values).