



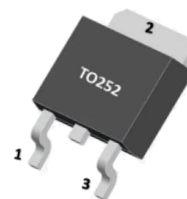
■ GENERAL DESCRIPTION

❖ SENSITIVE SCRS

❖ The **X0405** is suitable for all applications, such as motor control in kitchen aids, capacitive discharge ignitions, and overvoltage crowbar protection in low power supplies, etc

■ FEATURES

- ❖ $I_{T(RMS)}$: 4A
- ❖ V_{DRM}/V_{RRM} : 600/800V



Pin1:K (Cathode)
Pin2:A (Anode)
Pin3:G (Gate)

■ ABSOLUTE MAXIMUM RATINGS (TC=25°C, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Repetitive Peak Off-State Voltages	X0405	V_{DRM}/V_{RRM}	800	V
RMS On-State Current (180° Conduction Angle)	$T_i=60^{\circ}\text{C}$	$I_{T(RMS)}$	4	A
	$T_A=25^{\circ}\text{C}$		1.35	A
Average On-State Current (180° Conduction Angle)	$T_i=60^{\circ}\text{C}$	$I_{T(AV)}$	2.5	A
	$T_A=25^{\circ}\text{C}$		0.9	A
Non Repetitive Surge Peak On-State Current	$t_P=8.3\text{ms}, T_J=25^{\circ}\text{C}$	I_{TSM}	33	A
	$t_P=10\text{ms}, T_J=25^{\circ}\text{C}$		30	A
$I^2 t$ Value for Fusing	$t_P=10\text{ms}, T_J=25^{\circ}\text{C}$	$I^2 t$	4.5	$\text{A}^2 \text{s}$
Critical Rate of Rise of On-State Current $I_G=2 \times I_{GT}, t_r \leq 100\text{ns}$	$F=60\text{Hz}, T_J=125^{\circ}\text{C}$	di/dt	50	$\text{A}/\mu\text{s}$
Peak Gate Current	$t_P=20\mu\text{s}, T_J=125^{\circ}\text{C}$	I_{GM}	1.2	A
Average Gate Power Dissipation	$T_J=125^{\circ}\text{C}$	$P_{G(AV)}$	0.2	W
Operating Junction Temperature		T_J	-40 ~ +125	$^{\circ}\text{C}$
Storage Junction Temperature		T_{STG}	-40 ~ +150	$^{\circ}\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.
Absolute maximum ratings are stress ratings only and functional device operation is not implied.



■ THERMAL RESISTANCES

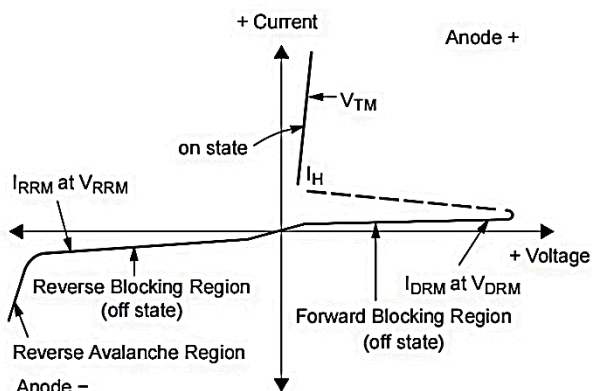
PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252	$R\theta_{JA}$	62.5	$^{\circ}\text{C}/\text{W}$
	TO220F		65	$^{\circ}\text{C}/\text{W}$
	SOT-89		120	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-252	$R\theta_{JC}$	5	$^{\circ}\text{C}/\text{W}$
	TO-220F		3	$^{\circ}\text{C}/\text{W}$
	SOT-89		25	$^{\circ}\text{C}/\text{W}$

■ ELECTRICAL CHARACTERISTICS (T_J=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Gate Trigger Current	I_{GT}	$V_D=12\text{V}, R_L=140\Omega$	20		200	μA
Gate Trigger Voltage	V_{GT}				0.8	V
Gate Non-Trigger Voltage	V_{GD}	$V_D=V_{DRM}, R_L=3.3\text{k}\Omega, R_{GK}=1\text{k}\Omega, T_J=125^{\circ}\text{C}$	0.1			V
Repetitive Gate Voltage	V_{RG}	$I_{RG}=10\mu\text{A}$	8			V
Holding Current	I_H	$I_T=50\text{mA}, R_{GK}=1\text{k}\Omega$			5	mA
Latching Current	I_L	$I_G=1\text{mA}, R_{GK}=1\text{k}\Omega$	6			mA
Critical Rate of Rise of Off-State Voltage	dV/dt	$V_D=67\%V_{DRM}, R_{GK}=1\text{k}\Omega, T_J=110^{\circ}\text{C}$	15			V/ μs
Peak On-State Voltage	V_{TM}	$I_{TM}=8\text{A}, t_p=380\mu\text{s}, T_J=25^{\circ}\text{C}$			1.8	V
Threshold Voltage	V_{TO}	$T_J=125^{\circ}\text{C}$			0.95	V
Dynamic Resistance	R_D	$T_J=125^{\circ}\text{C}$			100	m Ω
Repetitive Peak Off-State Current	I_{DRM}	$V_{DRM}=V_{RRM}, R_{GK}=1\text{k}\Omega, T_J=25^{\circ}\text{C}$			5	μA
	I_{RRM}	$V_{DRM}=V_{RRM}, R_{GK}=1\text{k}\Omega, T_J=125^{\circ}\text{C}$			1	mA

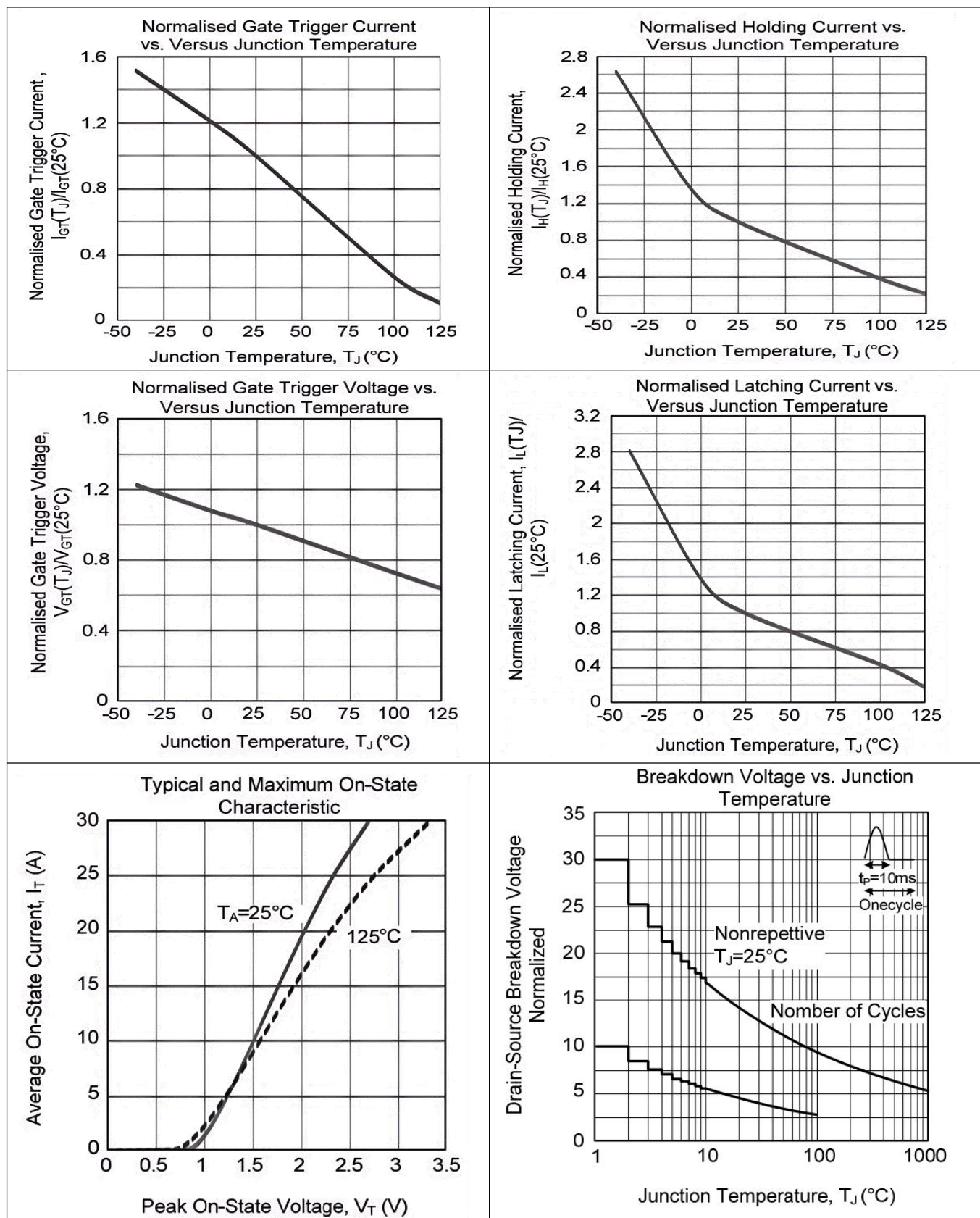
Voltage Current Characteristic of SCR

Symbol	Parameter
V_{DRM}	Peak Repetitive Off State Forward Voltage
I_{DRM}	Peak Forward Blocking Current
V_{RRM}	Peak Repetitive Off State Reverse Voltage
I_{RRM}	Peak Reverse Blocking Current
V_{TM}	Peak On State Voltage
I_H	Holding Current

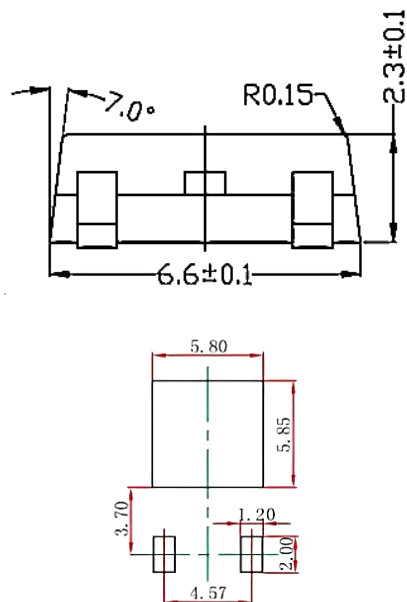
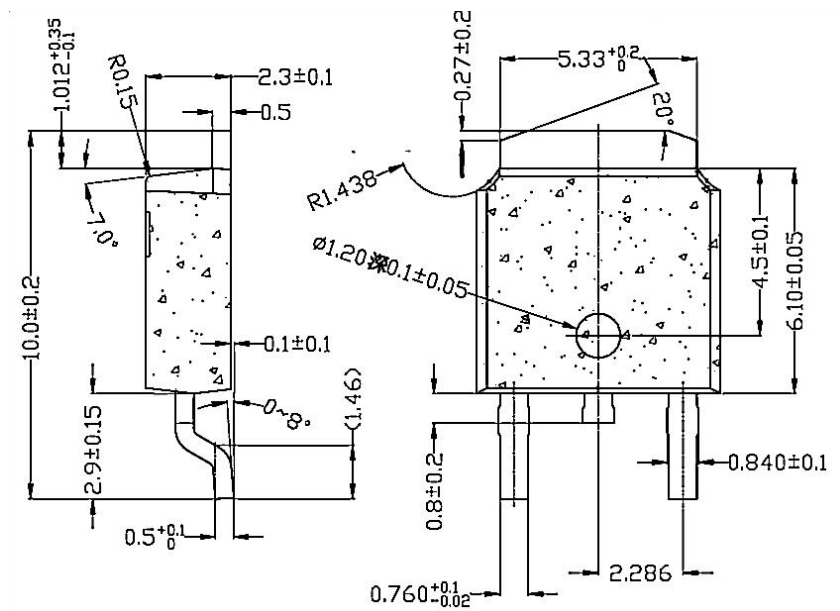




■ TYPICAL CHARACTERISTICS

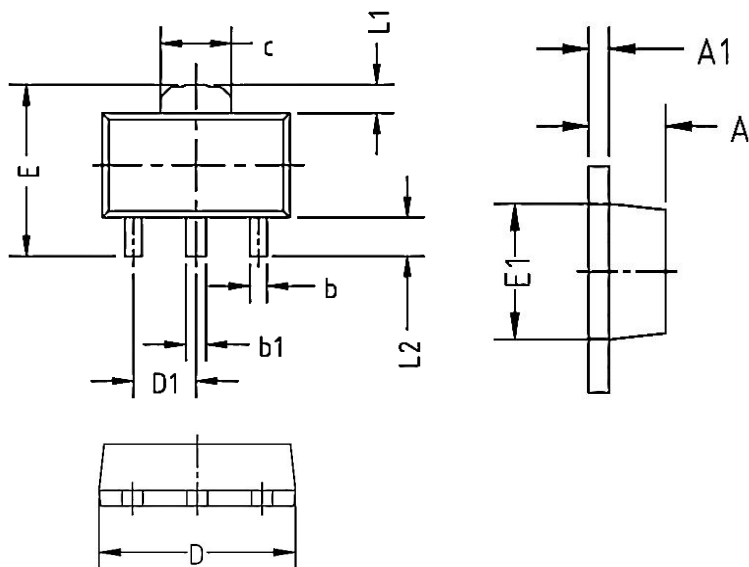


■ TO-252 PACKAGE OUTLINE DIMENSIONS





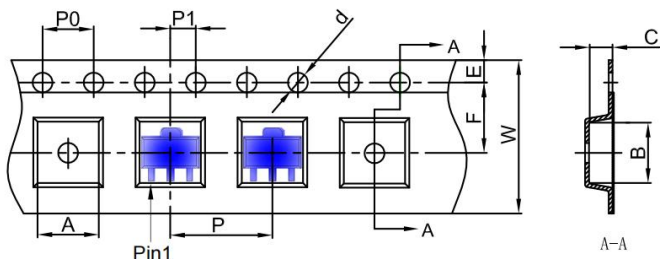
■ SOT-89 PACKAGE OUTLINE DIMENSIONS



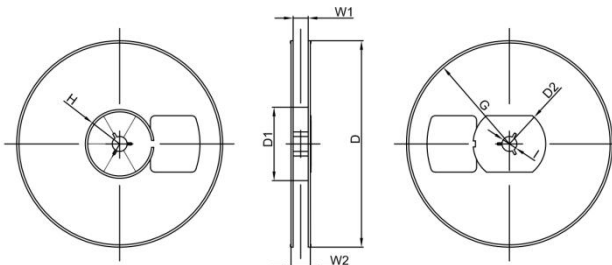
COMMON DIMENSION(MM)			
PKG	SOT-89		
Symbol	MIN	MON	MAX
A	1.450	1.500	1.550
A1	0.350	0.400	0.450
b	0.350	0.400	0.48
b1	0.430	0.480	0.550
C	1.500	1.550	1.650
D	4.450	4.550	4.700
D1	1.470	1.500	1.550
E	4.100	4.200	4.300
E1	2.500	2.550	2.650
L1	0.650	0.700	0.750
L2	0.900	0.950	1.000

■ SOT-89 PACKAGING INFORMATION

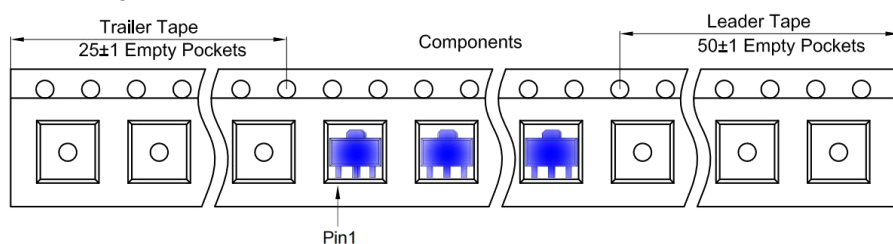
SOT-89 Embossed Carrier Tape



SOT-89 Reel



SOT-89 Tape Leader and Trailer



REEL	Reel Size
1000 pcs	7 inch

Dimensions are in millimeter

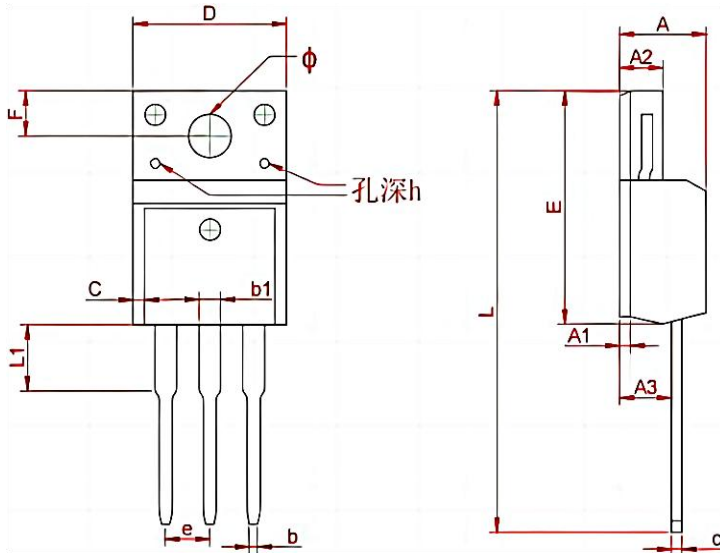
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-89-3L	4.85	4.45	1.85	Ø1.50	1.75	5.50	4.00	8.00	2.00	12.00

Dimensions are in millimeter

Reel Option	D	D1	D2	G	H	I	W1	W2
7" Dia	Ø180.00	60.00	R32.00	R86.50	R30.00	Ø13.00	13.20	16.50



■ **TO-220F PACKAGE OUTLINE DIMENSIONS**



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max	Min	Max
A	4.300	4.750	0.169	0.185
A1	1.830 REF		0.072 REF	
A2	2.300	2.850	0.090	0.112
A3	2.500	2.900	0.098	0.114
b	0.400	0.420	0.016	0.016
b1	1.220	1.280	0.048	0.050
C	0.690	0.720	0.027	0.028
c	0.490	0.510	0.019	0.020
D	9.960	10.200	0.392	0.400
E	15.000	15.950	0.588	0.625
e	2.574 TYP		0.101TYP	
F	3.470 REF		0.136 REF	
y	3.200 REF		0.125 REF	
h	0.000	0.300	0.000	0.012
L	28.780	28.900	1.128	1.133
L1	2.990	3.100	0.117	0.122