

600V, 12A STANDARD TRIAC

This device is suitable for low power AC switching application, phase control application such as fan speed and temperature modulation control, lighting control and static switching relay.

Features

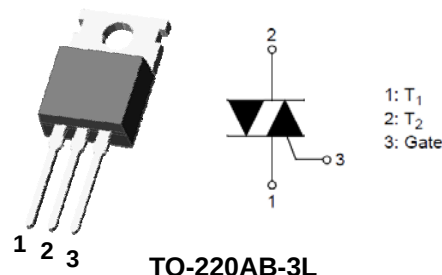
- Repetitive Peak Off-State Voltage : $V_{DRM}=600V$
- R.M.S On-State Current : $I_{T(RMS)}=12A$
- Gate trigger current : $I_{GT}=40mA$ max (Mode I - II - III)
- High Commutation: $(di/dt)_C = 6.0A/ms$ (Min)

Applications

- Switching mode power supply, light dimmer
- TV sets, stereo, refrigerator, washing machine
- Electric blanket, solenoid driver, small motor control
- Photo copier, electric tool

Ordering Information

Device	Marking Code	Package	Packaging
SCT12N60P	SCT12N60	TO-220AB-3L	50 Units / Tube

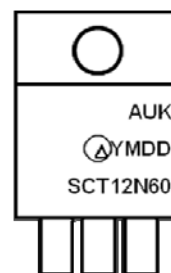


TO-220AB-3L

Product Characteristics

Symbol	Rating
$I_{T(RMS)}$	12A
V_{DRM}	600V

Marking Diagram



Column 1 : Manufacture Logo
Column 2 : Production Information
- Δ : Factory Management Code
- YMDD : Date Code (Year, Month, Date)
Column 3 : Device code

Absolute Maximum Ratings (Limiting Values)

Characteristic	Symbol	Value	Unit
Repetitive Peak Off-state Voltage	V_{DRM}	600	V
RMS on-state current (full sine wave)	$I_{T(RMS)}$	12	A
Non- repetitive surge peak on-state current (full cycle, T_j initial = 25°C)	I_{TSM}	126	A
I^2t Value for fusing	I^2t	78	A ² s
Peak gate current	I_{GM}	4	A
Peak gate power dissipation	P_{GM}	5	W
Average gate peak dissipation	$P_{G(AV)}$	1	W
Storage temperature range	T_{stg}	-40 to +150	°C
Operating junction temperature range	T_j	-40 to +125	°C

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum thermal resistance junction to case (AC)	$R_{th(j-c)}$	2.0	$^{\circ}\text{C/W}$
Maximum thermal resistance junction to ambient (AC)	$R_{th(j-a)}$	60	$^{\circ}\text{C/W}$

Electrical Characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise specified)

Off Characteristics

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Repetitive peak Off-state current	I_{DRM}	$V_D = V_{DRM}$	-	-	5	μA
Repetitive peak reverse current	I_{RRM}	$V_R = V_{RRM}$	-	-	5	μA

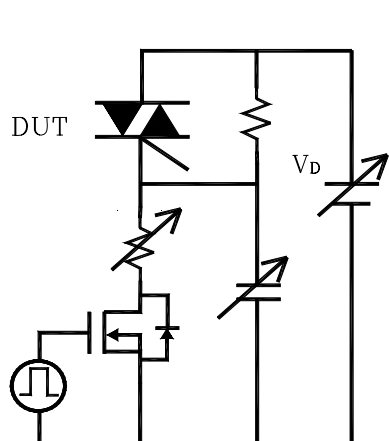
On Characteristics

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Peak On-state voltage	V_{TM}	$I_T = 17\text{A}$	-	-	1.55	V
Holding current	I_H	$V_D = 12\text{V}, I_T = 0.2\text{A}$	-	-	60	mA
Gate trigger current	$I_{GT} \text{ (I - II - III)}$	$V_D = 12\text{V}, R_L = 30\Omega$	-	-	40	mA
	$I_{GT} \text{ (IV)}$	-	-	-	-	mA
Gate trigger voltage	$V_{GT} \text{ (I - II - III)}$	$V_D = 12\text{V}, R_L = 30\Omega$	-	-	1.3	V
Gate Non-trigger voltage	V_{GD}	$V_D = 2/3 V_{DRM}, T_J=125^{\circ}\text{C}$	0.2	-	-	V

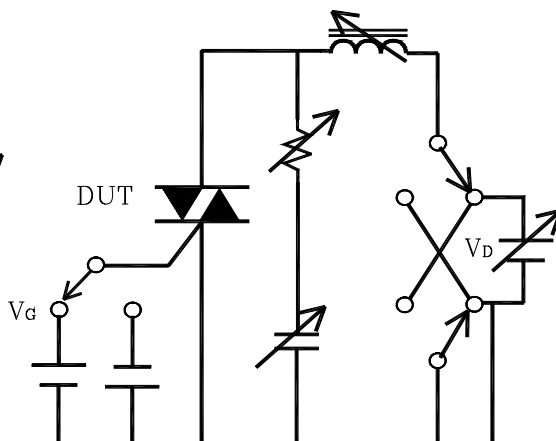
Dynamic Characteristics

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Critical rate of rise of Off-state Voltage	$(dV/dt)_S$	$V_D = 2/3 V_{DRM}, T_J=125^{\circ}\text{C}$	2000	-	-	$\text{V}/\mu\text{S}$
Rate of Change of Commutation Current	$(dI/dt)_C$	$(dV/dt)_C=10\text{V}/\mu\text{S} \downarrow, T_J=125^{\circ}\text{C}$	6.0	-	-	A/ms
Critical rate of rise of on-state current	dI/dt	$f=120\text{Hz}, I_G = 2 \times I_{GT}, t_r \leq 100 \text{ ns}, T_J=125^{\circ}\text{C}$	-	-	50	$\text{A}/\mu\text{S}$

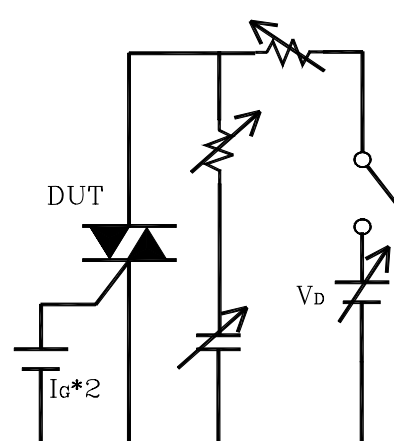
Simple circuit for $(dV/dt)_S$



Simple circuit for $(dI/dt)_C$ vs $(dV/dt)_C$



Simple circuit for dI/dt



Electrical Characteristic Curves

Fig. 1 $P - I_{T(RMS)}$

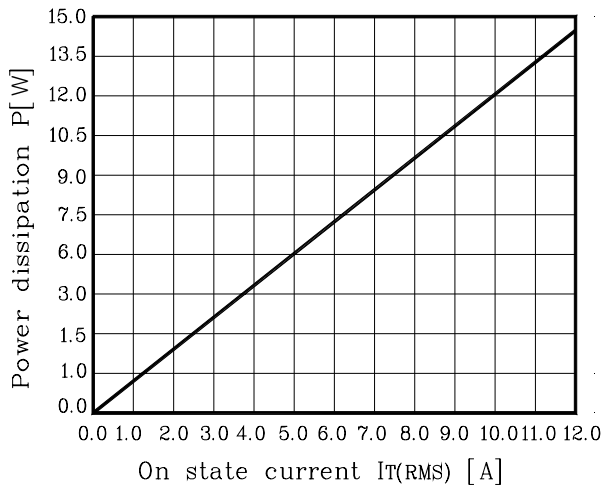


Fig. 2 $I_{T(RMS)} - T_C$

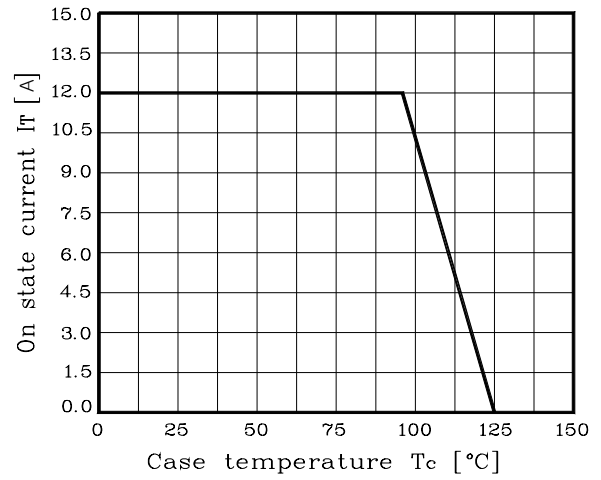


Fig. 3 $I_T - V_T$

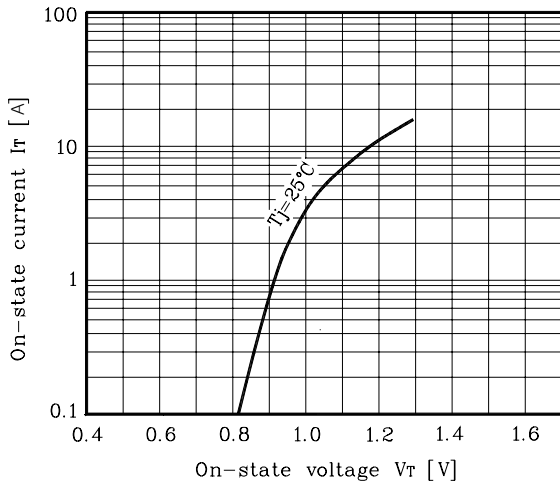


Fig. 4 $(di/dt)_C - (dV/dt)_C$

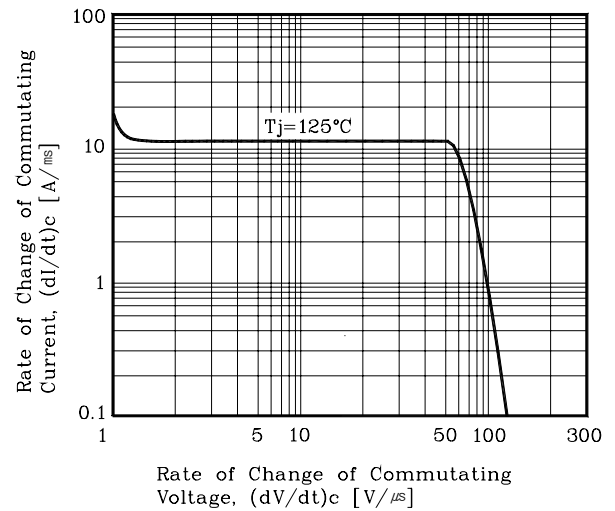


Fig. 5 $I_{GT} - T_J$

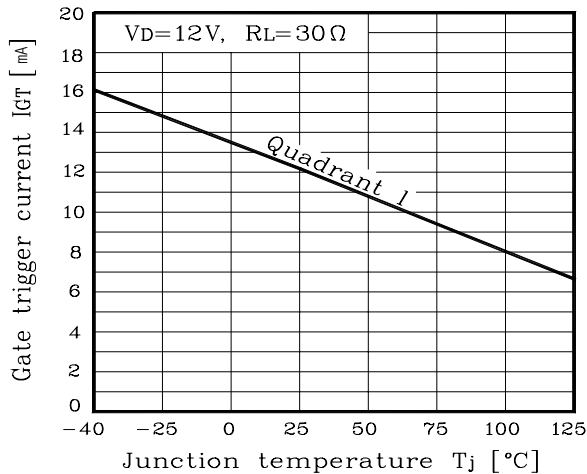
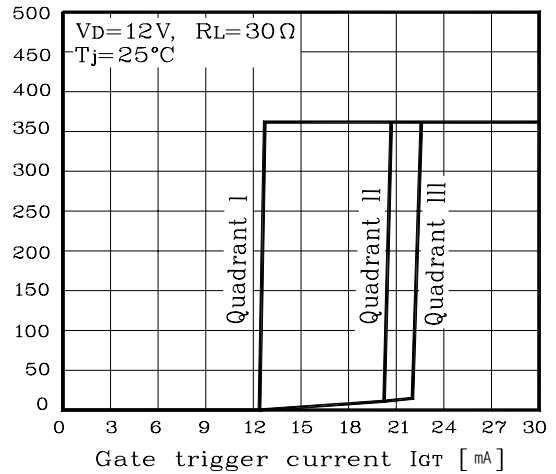


Fig. 6 $I_T - I_{GT}$



Electrical Characteristic Curves

Fig. 7 $V_{GT} - T_j$

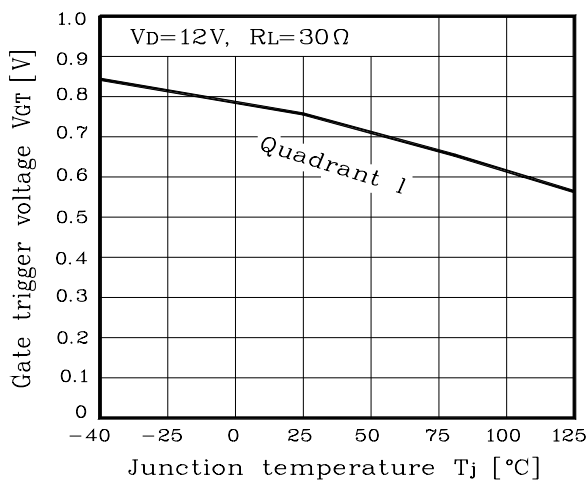


Fig. 8 $I_T - V_{GT}$

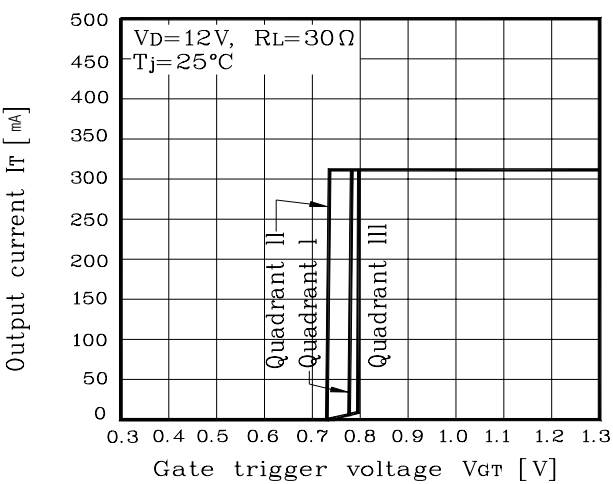
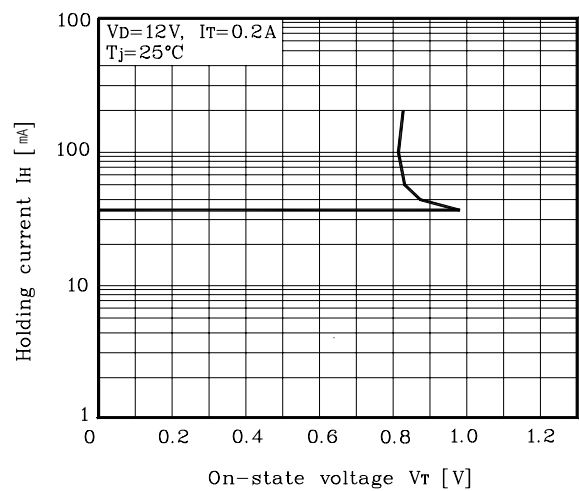
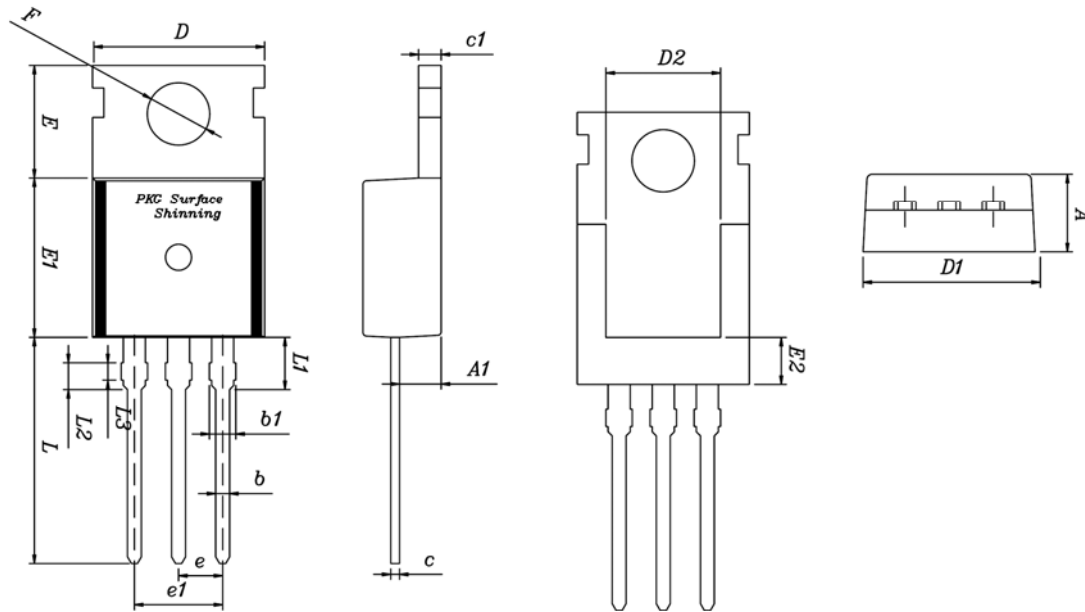


Fig. 9 $I_H - V_T$



Package Outline Dimension



SYMBOL	MILLIMETERS			NOTE
	MINIMUM	NOMINAL	MAXIMUM	
A	4.35	4.50	4.65	
A1	2.20	2.40	2.60	
b	0.65	0.80	0.95	
b1	1.42	1.52	1.62	
C	0.40	0.50	0.60	
C1	1.20	1.30	1.40	
D	9.80	10.00	10.20	
D1	9.85	10.00	10.15	
D2	6.40	6.60	6.80	
E	6.30	6.50	6.70	
E1	9.05	9.20	9.35	
E2	2.50	2.70	2.90	
F	3.50	3.60	3.70	
e	2.34	2.54	2.64	
e1	4.88	5.08	5.28	
L	12.68	13.08	13.48	
L1	2.80	3.00	3.20	
L2	1.49	1.54	1.59	
L3	0.95	1.00	1.05	

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