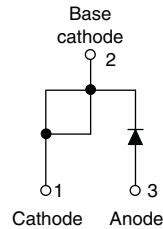


## Schottky Rectifier, 6 A


**TO-220AC**


### FEATURES

- 175 °C  $T_J$  operation
- High frequency operation
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- Designed and qualified for industrial level

### DESCRIPTION

The 6TQ... Schottky rectifier series has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

### PRODUCT SUMMARY

$I_{F(AV)}$	6 A
$V_R$	35 to 45 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	6	A
$V_{RRM}$	Range	35 to 45	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	690	A
$V_F$	6 Apk, $T_J = 125 \text{ }^\circ\text{C}$	0.53	V
$T_J$	Range	- 55 to 175	$^\circ\text{C}$

### VOLTAGE RATINGS

PARAMETER	SYMBOL	6TQ035	6TQ040	6TQ045	UNITS
Maximum DC reverse voltage	$V_R$	35	40	45	V
Maximum working peak reverse voltage	$V_{RWM}$				

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 164 \text{ }^\circ\text{C}$ , rectangular waveform	6	A
Maximum peak one cycle non-repetitive surge current See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	690	A
		10 ms sine or 6 ms rect. pulse		
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25 \text{ }^\circ\text{C}$ , $I_{AS} = 1.20 \text{ A}$ , $L = 11.10 \text{ mH}$	8	mJ
Repetitive avalanche current	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	1.20	A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	6 A	$T_J = 25\text{ }^\circ\text{C}$	0.60	V
		12 A		0.73	
		6 A	$T_J = 125\text{ }^\circ\text{C}$	0.53	
		12 A		0.64	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.8	mA
		$T_J = 125\text{ }^\circ\text{C}$		7	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.35	V
Forward slope resistance	$r_t$			18.23	m $\Omega$
Maximum junction capacitance	$C_T$	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 $^\circ\text{C}$		400	pF
Typical series inductance	$L_S$	Measured lead to lead 5 mm from package body		8	nH
Maximum voltage rate of change	dV/dt	Rated $V_R$		10 000	V/ $\mu\text{s}$

**Note**(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$			- 55 to 175	$^\circ\text{C}$
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation See fig. 4		2.2	$^\circ\text{C/W}$
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased		0.50	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum			6 (5)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device		Case style TO-220AC		6TQ035	
				6TQ040	
				6TQ045	

**ORDERING INFORMATION TABLE**

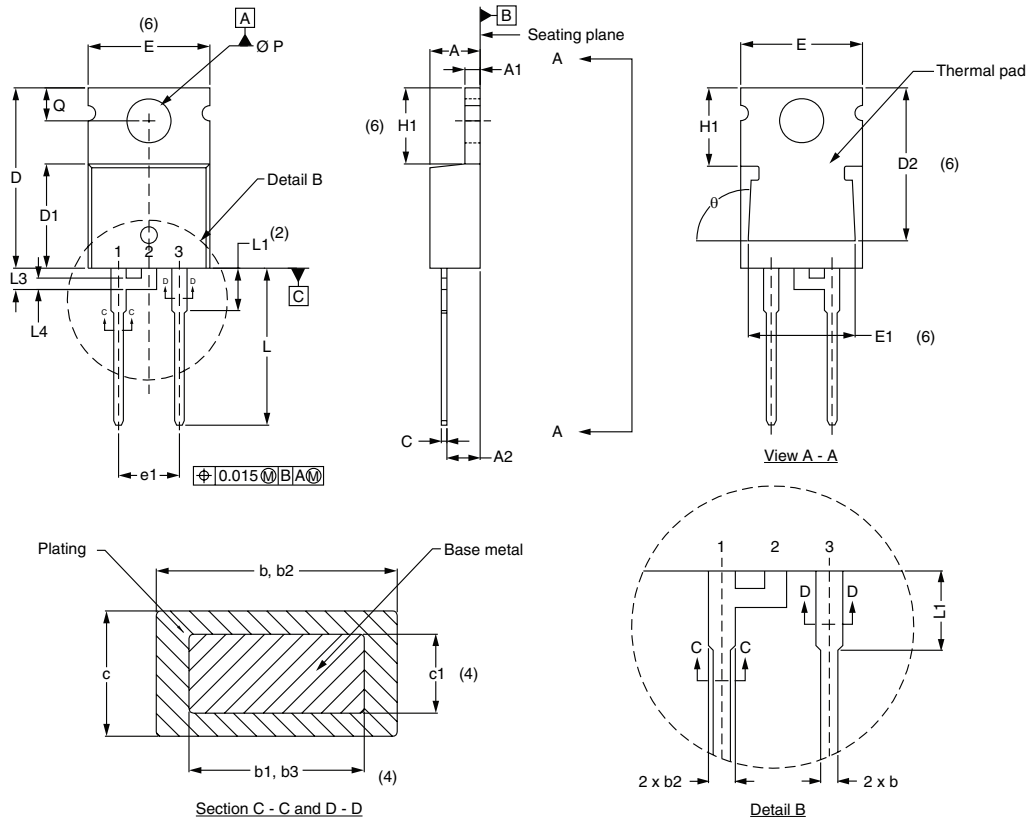
Device code	<b>6</b>	<b>T</b>	<b>Q</b>	<b>045</b>	<b>-</b>
	①	②	③	④	⑤
	<b>1</b>	-	Current rating (6 = 6 A)		
	<b>2</b>	-	Package: T = TO-220		
	<b>3</b>	-	Schottky "Q" series		
	<b>4</b>	-	Voltage ratings		
	<b>5</b>	-	<ul style="list-style-type: none"> <li>• None = Standard production</li> <li>• PbF = Lead (Pb)-free</li> </ul>		

035 = 35 V
040 = 40 V
045 = 45 V

Tube standard pack quantity: 50 pieces

## TO-220AC

### DIMENSIONS in millimeters and inches



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	3.56	4.82	0.140	0.190	
A1	0.51	1.40	0.020	0.055	
A2	2.04	2.92	0.080	0.115	
b	0.38	1.01	0.015	0.040	
b1	0.38	0.96	0.015	0.038	4
b2	1.15	1.77	0.045	0.070	
b3	1.15	1.73	0.045	0.068	4
c	0.36	0.61	0.014	0.024	
c1	0.36	0.56	0.014	0.022	4
D	14.22	15.87	0.560	0.625	3
D1	8.38	9.02	0.330	0.355	
D2	12.19	12.88	0.480	0.507	6

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
E	9.66	10.66	0.380	0.420	3, 6
E1	8.38	8.89	0.330	0.350	6
e	2.54 BSC		0.100 BSC		
e1	5.08 BSC		0.200 BSC		
H1	5.85	6.86	0.230	0.270	6
L	12.70	14.73	0.500	0.580	
L1	-	6.35	-	0.250	2
L3	1.78	2.13	0.070	0.084	
L4	0.76	1.27	0.030	0.050	
Ø P	3.54	3.73	0.139	0.147	
Q	2.54	3.05	0.100	0.120	
θ	90° to 93°		90° to 93°		

#### Notes

- (1) Dimensioning and tolerancing per ASME Y14.5M-1994
- (2) Lead dimension and finish uncontrolled in L1
- (3) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (4) Dimension b1, b3 and c1 apply to base metal only
- (5) Controlling dimensions: inches
- (6) Thermal pad contour optional within dimensions E, H1, D2 and E1
- (7) Outline conforms are derived from the actual package outline