

TK36

PHASE CONTROL THYRISTOR

APPLICATIONS

- High Power Drives.
- High Voltage Power Supplies.
- DC Motor Control.
- Welding.
- Battery Chargers.

KEY PARAMETERS

V_{DRM}	1200V
$I_{T(AV)}$	245A
I_{TSM}	5500A
dV/dt^*	200V/ μ s
di/dt	500A/ μ s

*Higher dV/dt selections available

FEATURES

- High Surge Capability.

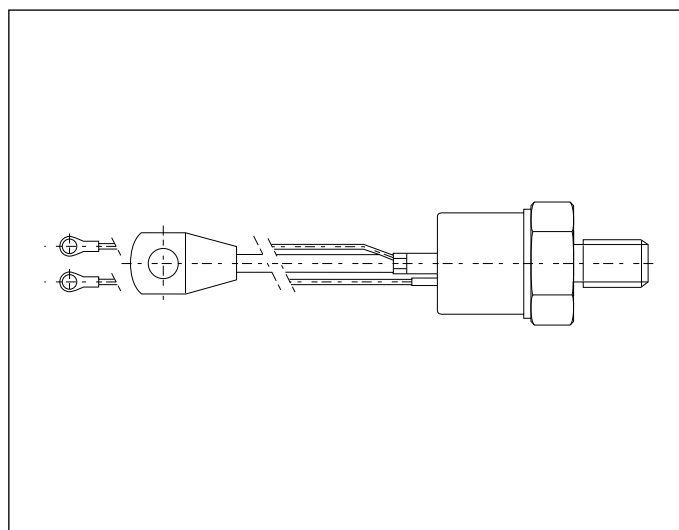
VOLTAGE RATINGS

Type Number	Repetitive Peak Voltages V_{DRM} V_{RRM}	Conditions
TK36 12 M or K TK36 10 M or K TK36 08 M or K	1200 1000 800	$T_{vj} = 0^\circ$ to 125°C , $I_{DRM} = I_{RRM} = 100\text{mA}$, V_{DRM} V_{RRM} $t_p = 10\text{ms}$, V_{DSM} & $V_{RSM} =$ V_{DRM} & $V_{RRM} + 100\text{V}$ Respectively

Lower voltage grades available.

For 3/4" 16 UNF thread add K to type number, e.g. TK26 18K.

For M16 thread add M to type number, e.g. TK26 14M.



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CURRENT RATINGS

Symbol	Parameter	Conditions	Max.	Units
$I_{T(AV)}$	Mean on-state current	Half wave resistive load, $T_{case} = 80^\circ\text{C}$	245	A
$I_{T(RMS)}$	RMS value	$T_{case} = 80^\circ\text{C}$	385	A
I_T	Continuous (direct) on-state current	$T_{case} = 80^\circ\text{C}$	315	A

SURGE RATINGS

Symbol	Parameter	Conditions	Max.	Units
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}C$ $V_R = 50\% V_{RRM}$ - 1/4 sine	4.4	kA
I^2t	I^2t for fusing		96.8×10^3	A ² s
I_{TSM}	Surge (non-repetitive) on-state current	10ms half sine; $T_{case} = 125^{\circ}C$ $V_R = 0$	5.5	kA
I^2t	I^2t for fusing		151.25×10^3	A ² s

THERMAL AND MECHANICAL DATA

Symbol	Parameter	Conditions	Min.	Max.	Units
$R_{th(j-c)}$	Thermal resistance - junction to case	dc	-	0.13	°C/W
$R_{th(c-h)}$	Thermal resistance - case to heatsink	Mounting torque 35.0Nm with mounting compound	-	0.06	°C/W
T_{vj}	Virtual junction temperature	On-state (conducting)	-	125	°C
		Reverse (blocking)	-	125	°C
T_{stg}	Storage temperature range		-40	150	°C
-	Mounting torque		30.0	35.0	Nm

DYNAMIC CHARACTERISTICS

Symbol	Parameter	Conditions		Min.	Max.	Units
V _{TM}	Maximum on-state voltage	At 600A peak, T _{case} = 25°C		-	1.3	V
I _{RRM} /I _{DRM}	Peak reverse and off-state current	At V _{RRM} /V _{DRM} , T _{case} = 125°C		-	25	mA
dV/dt	Maximum linear rate of rise of off-state voltage	To 60% V _{DRM} T _j = 125°C, Gate open circuit		-	200	V/μs
dI/dt	Rate of rise of on-state current	Gate source 20V, 20Ω t _r ≤ 0.5μs, T _j = 125°C	Repetitive 50Hz	-	500	A/μs
			Non-repetitive	-	800	A/μs
V _{T(TO)}	Threshold voltage	At T _{vj} = 125°C		-	0.88	V
r _T	On-state slope resistance	At T _{vj} = 125°C		-	0.7	mΩ
t _{gd}	Delay time	V _D = 300V, I _G = 1A, I _T = 50A, dI/dt = 50A/μs, dI _G /dt = 1A/μs, T _j = 25°C		-	1.5	μs
I _L	Latching current	T _j = 25°C, V _D = 12V		-	-	mA
I _H	Holding current	T _j = 25°C, V _D = 12V, I _{TM} = 1A		-	50	mA

GATE TRIGGER CHARACTERISTICS AND RATINGS

Symbol	Parameter	Conditions	Typ.	Max.	Units
V_{GT}	Gate trigger voltage	$V_{DRM} = 12V$, $T_{case} = 25^{\circ}C$, $R_L = 6\Omega$	-	3.0	V
I_{GT}	Gate trigger current	$V_{DRM} = 12V$, $T_{case} = 25^{\circ}C$, $R_L = 6\Omega$	-	200	mA
V_{GD}	Gate non-trigger voltage	At V_{DRM} $T_{case} = 125^{\circ}C$, $R_L = 1k\Omega$	-	0.2	V
V_{FGM}	Peak forward gate voltage	Anode positive with respect to cathode	-	30	V
V_{FGN}	Peak forward gate voltage	Anode negative with respect to cathode	-	0.25	V
V_{RGM}	Peak reverse gate voltage		-	5	V
I_{FGM}	Peak forward gate current	Anode positive with respect to cathode	-	4	A
P_{GM}	Peak gate power	-	-	16	W
$P_{G(AV)}$	Mean gate power		-	3	W

CURVES

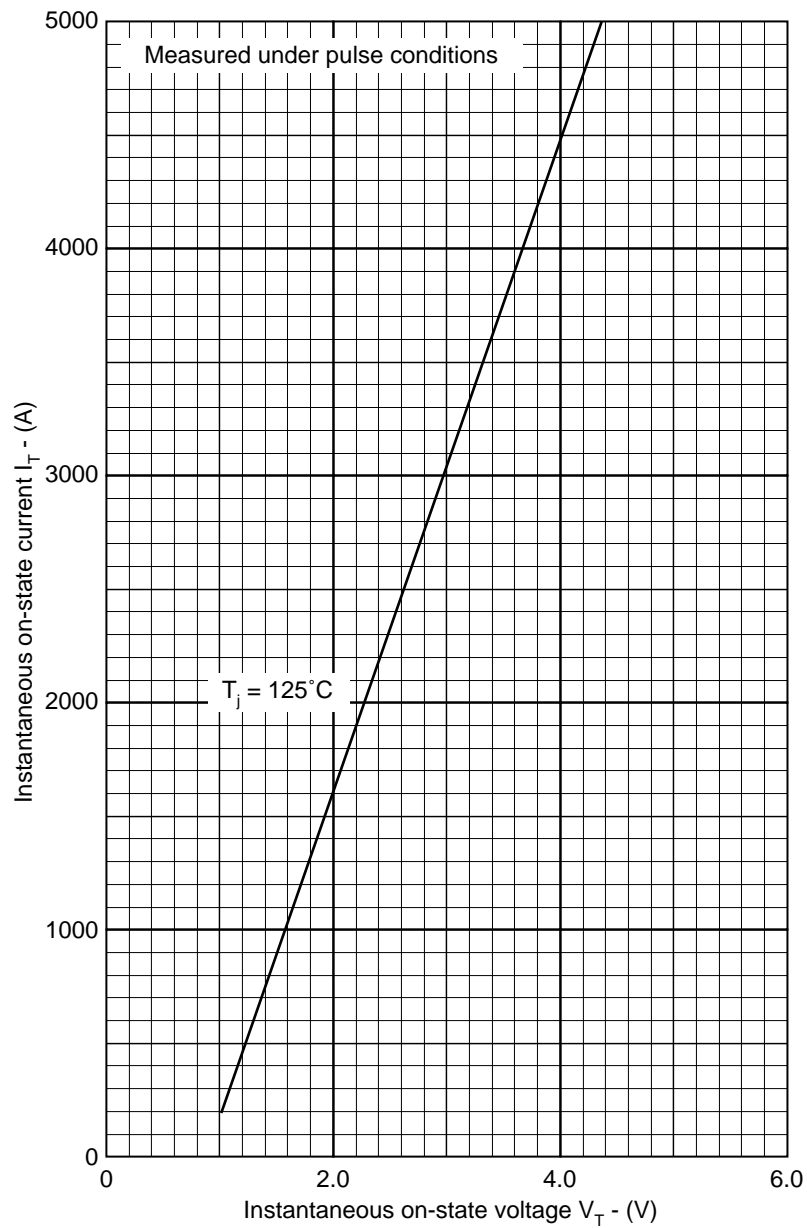
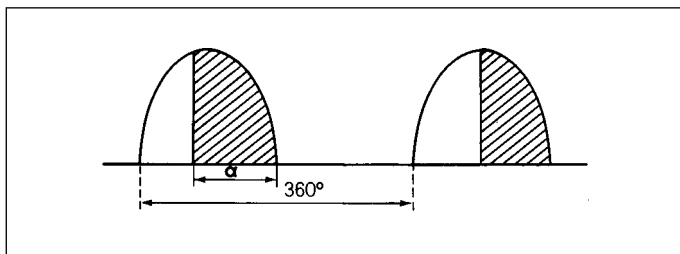
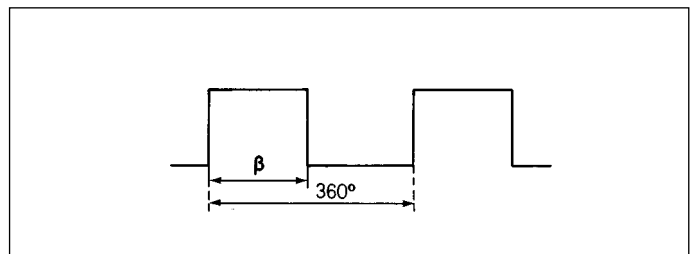


FIG. 1 MAXIMUM (LIMIT) ON-STATE CHARACTERISTICS

SINUSOIDAL CURRENT WAVEFORM



RECTANGULAR CURRENT WAVEFORM



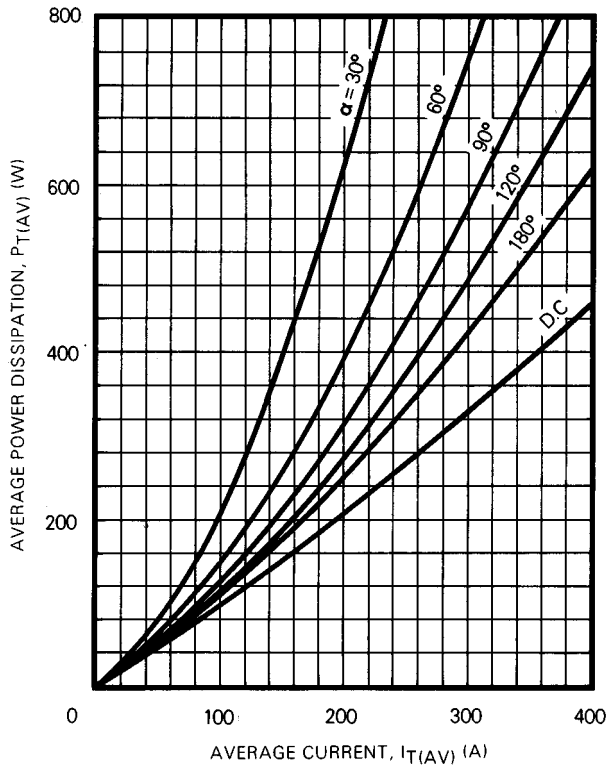


FIG. 2 MAXIMUM ON-STATE POWER DISSIPATION FOR SINUSOIDAL CURRENT WAVEFORM

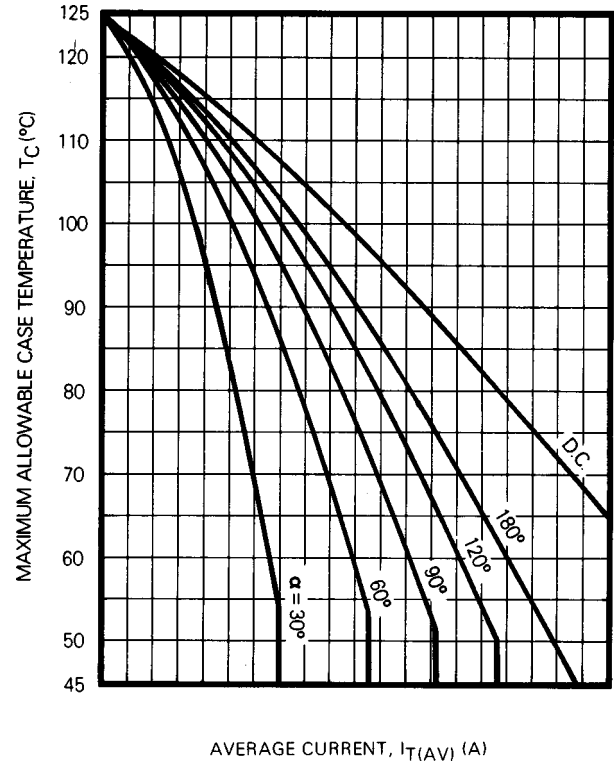


FIG. 3 MAXIMUM ALLOWABLE CASE TEMPERATURE FOR SINUSOIDAL CURRENT WAVEFORM

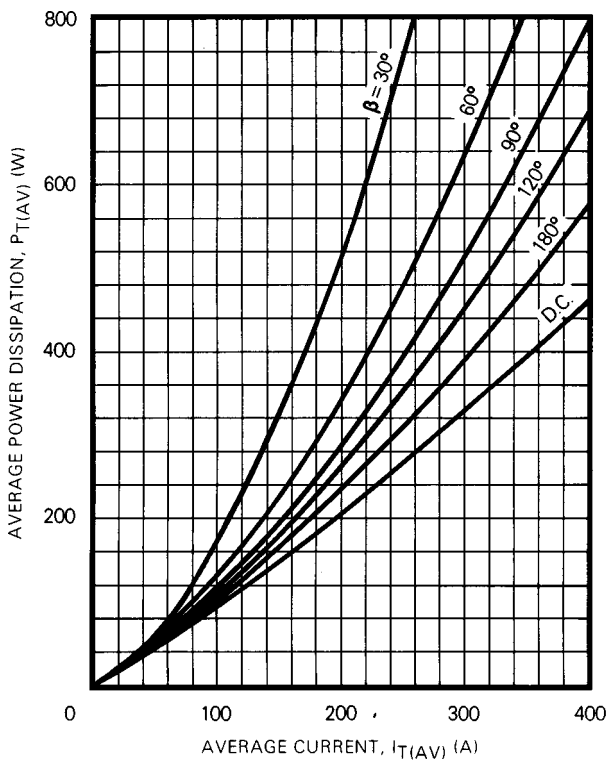


FIG. 4 MAXIMUM ON-STATE POWER DISSIPATION FOR RECTANGULAR CURRENT WAVEFORM

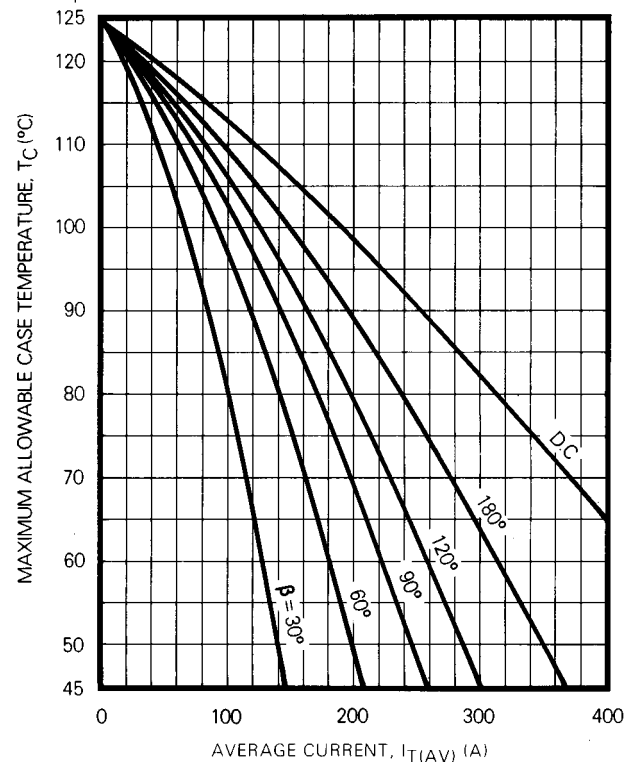


FIG. 5 MAXIMUM ALLOWABLE CASE TEMPERATURE FOR RECTANGULAR CURRENT WAVEFORM

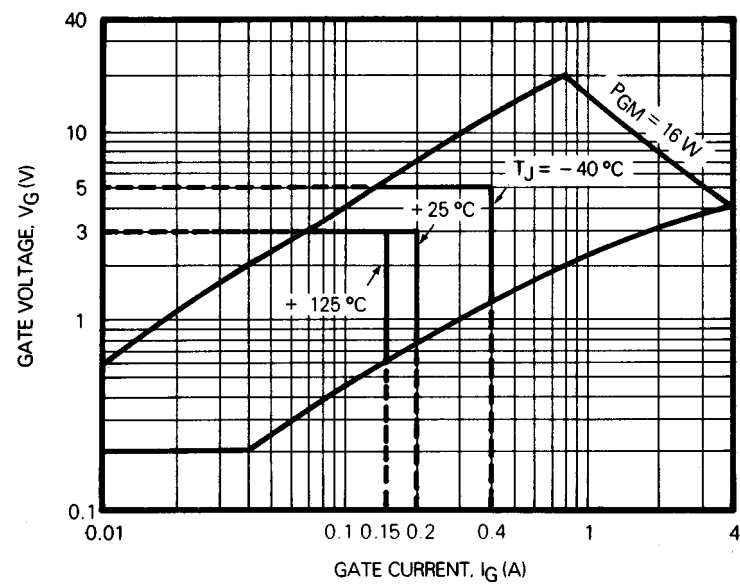
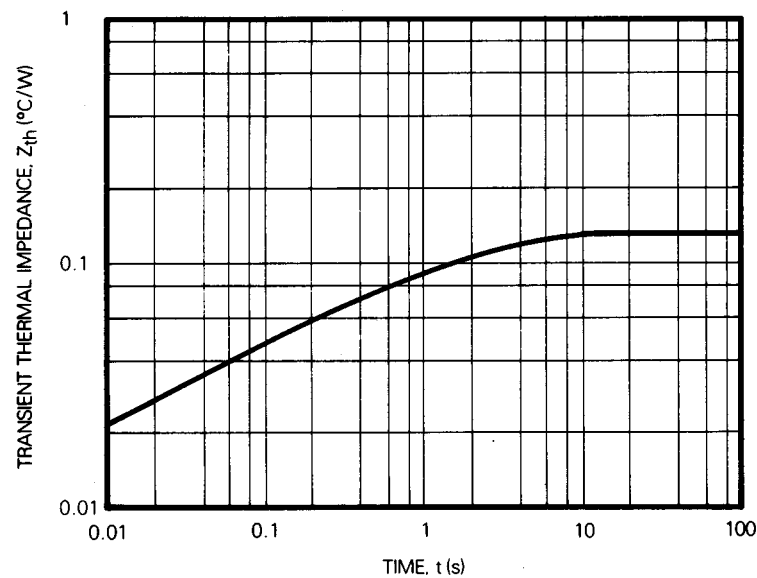
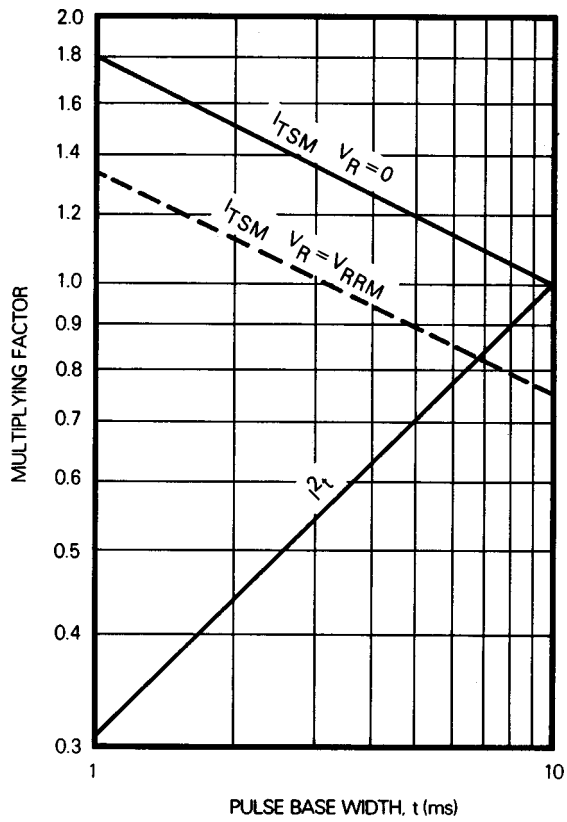


FIG. 6 GATE TRIGGER CHARACTERISTICS

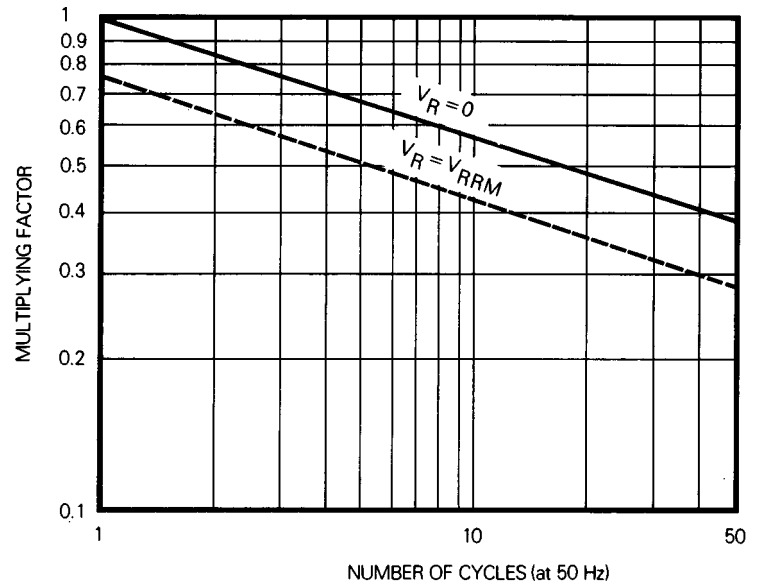


Conduction angle (α, β)	Effective thermal Resistance ($^\circ\text{C/W}$) Junction to case	
	Sinusoidal	Rectangular
180°	0.140	0.156
120°	0.146	0.176
90°	0.156	0.195
60°	0.169	0.221
30°	0.208	0.260

FIG. 7 TRANSIENT THERMAL IMPEDANCE - JUNCTION TO CASE



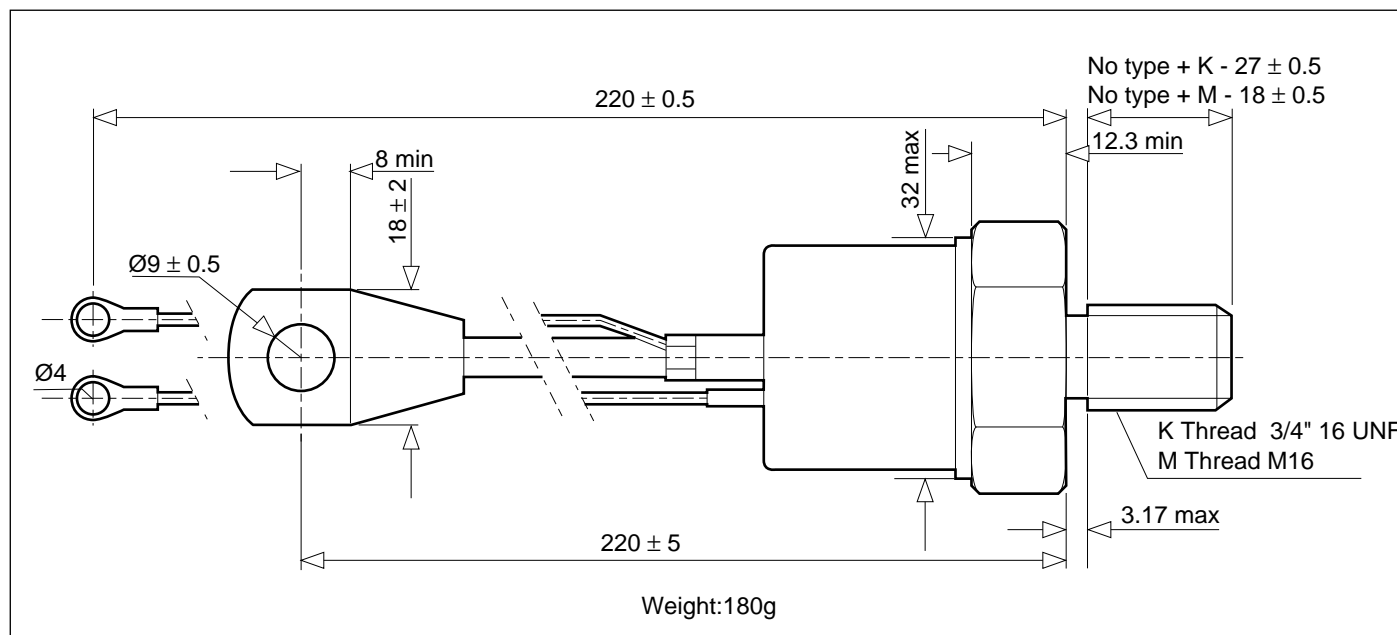
**FIG. 8 MULTIPLYING FACTOR FOR
NON-REPETITIVE SUB-CYCLE SURGE
ON-STATE CURRENT AND I^2t RATING**



**FIG. 9 MULTIPLYING FACTOR FOR NON-REPETITIVE SURGE
ON-STATE CURRENT**

PACKAGE DETAILS - TO93

For further package information, please contact your local Customer Service Centre. All dimensions in mm, unless stated otherwise. DO NOT SCALE.



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