

T1509N16TOF SERIES

DISC TYPE THYRISTOR

Features

- Metal case with ceramic insulator
- All diffused design, Center amplifying gate
- High surge current capabilities
- Guaranteed hng dv/dt
- Guaranteed hng di/dt
- Low thermal impedance
- High speed performance

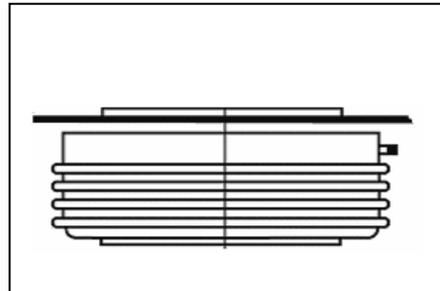
1500A

Typical Applications

- Inverters
- Induction heating

Major Ratings and Characteristics

Parameters	T1509N16TOF	Units
$I_{T(AV)}$	1500	A
	@ T_{hs}	85 °C
$I_{T(RMS)}$	2400	A
	@ T_{hs}	25 °C
I_{TSM}	@ 50Hz	15000 A
	@ 60Hz	16000 A
$I^2 t$	@ 50Hz	110 KA ² s
	@ 60Hz	100 KA ² s
V_{DRM} / V_{RRM}	1800	V
T_q	typical	300 μ s
T_J	range	- 40 to 125 °C



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ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak rev. voltage V	IDRM/IRRM max. @ $T_J = T_{Jmax}$. mA
T1509N16TOF	06	600	700	40
	10	1000	1100	
	14	1400	1500	
	18	1800	1900	

On-state Conduction

Parameter	T1509N	Units	Conditions
$I_{T(AV)}$ Maximum average on-state current @ Heatsink temperature	1500	A	180° conduction, half sine wave
	85	°C	Double side(single side)cooled
$I_{(RMS)}$ Maximum RMS on-state current	2400	A	DC@ 25°C heatsink temperature double side cooled
I_{TSM} Maximum peak, one-cycle non-repetitive surge current	15050	A	t = 10ms No voltage
	16100		t = 8.3ms reapplied
	17100		t = 10ms 100% V_{RRM}
	18200		t = 8.3ms reapplied
$I^2 t$ Maximum $I^2 t$ for fusing	110	KA ² s	t = 10ms No voltage
	100		t = 8.3ms reapplied
	77		t = 10ms 100% V_{RRM}
	71		t = 8.3ms reapplied
$I^2 \sqrt{t}$ Maximum $I^2 \sqrt{t}$ for fusing	1100	KA ² √s	t = 0.1 to 10ms, no voltage reapplied
V_{TM} Max. peak on-state voltage	2.07	V	$I_{TM} = 1255A$, $T_J = T_{Jmax}$, t p = 10ms sine wave pulse
I_H Maximum holding current	600	mA	$T_J = 25^\circ C$, $I_T > 30A$
I_L Typical latching current	1000		$T_J = 25^\circ C$, $V_A = 12V$, $R_a = 6\Omega$, $I_G = 1A$

Switching

Parameter	T1509N	Units	Conditions
di/dt Maximum non repetitive rate of rise of turned-on current	1000	A/μs	$T_J = T_{Jmax}$, $V_{DRM} = \text{rated } V_{DRM}$ $I_{TM} = 2 \times di/dt$
t_d Typical delay time	1.1	μs	$T_J = 25^\circ C$, $V_{DM} = \text{rated } V_{DRM}$, $I_{TM} = 50A$ DC, $t_p = 1\mu s$ Resistive load Gate pulse: 10V, 5Ω source
T_q Max. turn-off time (*)	Min 15		Max 30

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Blocking

Parameter	T1509N	Units	Conditions
dv/dt Maximum critical rate of rise of off-state voltage	500	V/ μ s	T _J = T _J max. linear to 80% V _{DRM} , higher value available on request
I _{DRM} Max. peak reverse and off-state leakage current	40	mA	T _J = T _J max, rated V _{DRM} /V _{RRM} applied

Triggering

Parameter	T1509N	Units	Conditions
P _{GM} Maximum peak gate power	60	W	T _J = T _J max, f = 50Hz, d% = 50
P _{G(AV)} Maximum average gate power	10		
I _{GM} Max. peak positive gate current	10	A	T _J = T _J max, t _p ≤ 5ms
+V _{GM} Maximum peak positive gate voltage	20	V	T _J = T _J max, t _p ≤ 5ms
-V _{GM} Maximum peak negative gate voltage	5.0		
I _{GT} DC gate current required to trigger	200	mA	T _J = 25°C, V _A = 12V, R _a = 6Ω
V _{GT} DC gate voltage required to trigger	3	V	
I _{GD} DC gate current not to trigger	20	mA	T _J = T _J max, rated V _{DRM} applied
V _{GD} DC gate voltage not to trigger	0.25	V	

Thermal and Mechanical Specification

Parameter	T1509N	Units	Conditions
T _J Max. operating temperature range	-40 to 125	°C	
T _{stg} Max. storage temperature range	-40 to 150		
R _{thJ-hs} Max. thermal resistance, junction to case	0.17 0.08	K/W	DC operation single side cooled DC operation double side cooled
R _{thC-hs} Max. thermal resistance, case to heatsink	0.033 0.017		DC operation single side cooled DC operation double side cooled
T Mounting torque, ± 10%	4900	N	
wt Approximate weight	660	g	

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Outline Table

