

120V 170A N-Channel Power MOSFET

Description

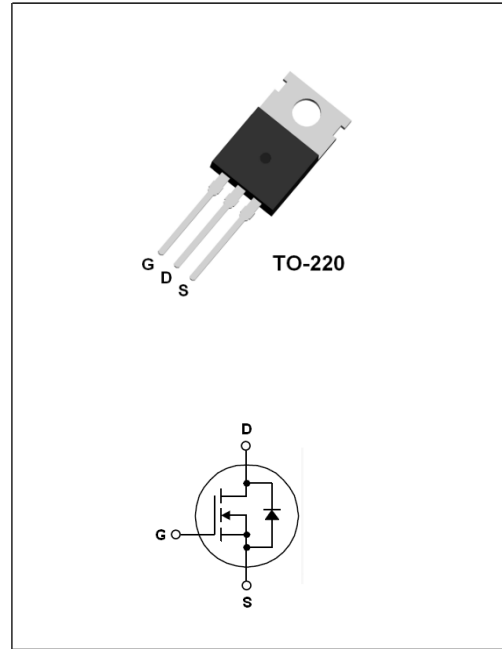
The AKT170N12T is an N-Channel enhancement mode power MOSFET and based on advanced SGT technology, it has extremely low static on-resistance and high avalanche energy strength. This device provide excellent switching performance for switched mode power supplies.

Features

- Advanced SGT Technology
- Typical on-Resistance:
 $R_{DS(on)}=4.5m\Omega @V_{GS}=10V, I_D=85A$
- Rated Avalanche Energy
- RoHS Compliant

Applications

- Switched Mode Power Supplies
- Motor Control
- Synchronous Rectification



Absolute Maximum Ratings @ $T_c=25^\circ C$ unless otherwise noted

Symbol	Parameter	Ratings	Unit	
V_{DSS}	Drain to Source Voltage	120	V	
V_{GSS}	Gate to Source Voltage	± 25	V	
I_D	Drain Current	$T_c=25^\circ C$	170	A
		$T_c=100^\circ C$	120	A
I_{DM}	Pulsed Drain Current (Note1)	680	A	
P_D	Maximum Power Dissipation	$T_c=25^\circ C$	250	W
	Derate above $25^\circ C$		2	W/ $^\circ C$
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	422	mJ	
T_J	Operating Junction Temperature Range	-55~+150	$^\circ C$	
T_{STG}	Storage Temperature Range	-55~+150	$^\circ C$	

Thermal Characteristics

Symbol	Parameter	Ratings	Unit
$R_{th(J-C)}$	Thermal Resistance, Junction to case	0.5	$^\circ C/W$
$R_{th(J-A)}$	Thermal Resistance, Junction to Ambient	45	$^\circ C/W$

Electrical Characteristics @ $T_c=25\text{ }^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain to Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	120	-	-	V
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	2.42	3.5	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=85A$	-	4.5	7.0	m Ω
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=V_{DSS}, V_{GS}=0V$	-	-	1	μA
I_{GSS}	Gate to Source Leakage Current	$V_{GS}=V_{GSS}, V_{DS}=0V$	-	-	± 200	nA

D-S Diode Characteristics and Maximum Rating @ $T_c=25\text{ }^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Maximum Drain to Source Diode Forward Current		-	-	170	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS}=0V, I_S=170A$	-	1.1	1.3	V
t_{rr}	Reverse Recovery Time	$V_{GS}=0V, I_S=20A,$	-	48	-	ns
Q_{rr}	Reverse Recovery Charge	$di/dt=-500A/\mu s$	-	336	-	nC

Switching Characteristics @ $T_c=25\text{ }^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	$I_D=20A,$ $V_{DD}=60V, V_{GS}=10V$ $R_G=10\Omega$ (Note 3)	-	25	-	ns
t_r	Rising Time		-	19	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	36	-	ns
t_f	Falling Time		-	9.6	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=60V,$ $f=1.0MHz$	-	5142	-	pF
C_{oss}	Output Capacitance		-	573	-	pF
C_{rss}	Reverse Transfer Capacitance		-	12	-	pF
Q_g	Total Gate Charge	$I_D=20A,$ $V_{DD}=60V$ $V_{GS}=10V$ (Note 3)	-	55	-	nC
Q_{gs}	Gate to Source Charge		-	16	-	nC
Q_{gd}	Gate to Drain Charge		-	6.4	-	nC

Note:

1. Repetitive rating; pulse-width limited by maximum junction temperature
2. $V_{DD}=100V, L=5mH, V_G=10V, I_{AS}=13A$
3. Essentially independent of operating temperature typical characteristics

Package Dimensions

TO-220

(Dimensions in Millimeters)

