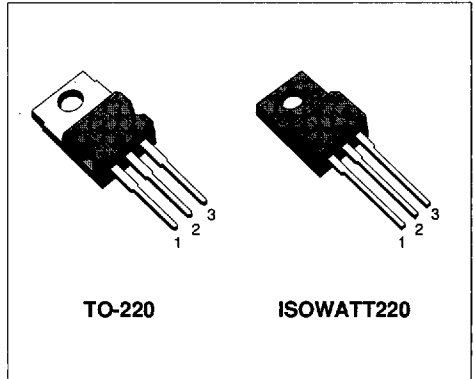


N - CHANNEL ENHANCEMENT MODE LOW THRESHOLD POWER MOS TRANSISTOR

ADVANCE DATA

TYPE	V _{DSS}	R _{DS(on)}	I _D
STP40N06L	60 V	0.04 Ω	40 A
STP40N06LFI	60 V	0.04 Ω	22 A

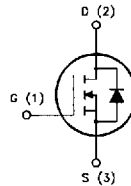
- AVALANCHE RUGGEDNESS TECHNOLOGY
- 100% AVALANCHE TESTED
- REPETITIVE AVALANCHE DATA AT 100°C
- LOW GATE CHARGE
- HIGH CURRENT CAPABILITY
- LOGIC LEVEL COMPATIBLE INPUT
- 175°C OPERATING TEMPERATURE FOR STANDARD PACKAGE
- APPLICATION ORIENTED CHARACTERIZATION
- ISOLATED PACKAGE UL RECOGNIZED, ISOLATION TO 2000V DC



APPLICATIONS

- HIGH CURRENT, HIGH SPEED SWITCHING
- SOLENOID AND RELAY DRIVERS
- REGULATORS
- DC-DC & DC-AC CONVERTERS
- MOTOR CONTROL, AUDIO AMPLIFIERS
- AUTOMOTIVE ENVIRONMENT (INJECTION, ABS, AIR-BAG, LAMPDRIVERS, Etc.)

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value		Unit
		STP40N06L	STP40N06LFI	
V _{DS}	Drain-source Voltage (V _{GS} = 0)	60		V
V _{DGR}	Drain- gate Voltage (R _{GS} = 20 kΩ)	60		V
V _{GS}	Gate-source Voltage	± 15		V
I _D	Drain Current (continuous) at T _c = 25 °C(♯)	40	22	A
I _D	Drain Current (continuous) at T _c = 100 °C	30	13	A
I _{DM} (*)	Drain Current (pulsed)	160	160	A
P _{tot}	Total Dissipation at T _c = 25 °C	150	40	W
	Derating Factor	1	0.32	W/°C
T _{stg}	Storage Temperature	-65 to 175	-65 to 150	°C
T _j	Max. Operating Junction Temperature	175	150	°C

(*) Pulse width limited by safe operating area

(♯) T_c = 50 °C for TO-220

THERMAL DATA

			TO-220	ISOWATT220	
R _{thj-case}	Thermal Resistance Junction-case	Max	1	3.12	°C/W
R _{thj-amb}	Thermal Resistance Junction-ambient	Max	62.5		°C/W
R _{thc-sink}	Thermal Resistance Case-sink	Typ	0.5		°C/W
T _l	Maximum Lead Temperature For Soldering Purpose		300		°C

ELECTRICAL CHARACTERISTICS (T_{case} = 25 °C unless otherwise specified)

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{(BR)DSS}	Drain-source Breakdown Voltage	I _D = 250 μA V _{GS} = 0	60			V
I _{DSS}	Zero Gate Voltage Drain Current (V _{GS} = 0)	V _{DS} = Max Rating V _{DS} = Max Rating x 0.8 T _c = 125 °C			250 1000	μA μA
I _{GSS}	Gate-body Leakage Current (V _{DS} = 0)	V _{GS} = ± 15 V			± 100	nA

ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} I _D = 250 μA	1		2.5	V
R _{DS(on)}	Static Drain-source On Resistance	V _{GS} = 5 V I _D = 20 A V _{GS} = 5 V I _D = 20 A T _c = 100°C			0.04 0.08	Ω Ω
I _{D(on)}	On State Drain Current	V _{DS} > I _{D(on)} x R _{DS(on)max} V _{GS} = 5 V	40			A

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g _{fs} (*)	Forward Transconductance	V _{DS} > I _{D(on)} x R _{DS(on)max} I _D = 20 A	15			mho
C _{iss}	Input Capacitance	V _{DS} = 25 V f = 1 MHz V _{GS} = 0			2200	pF
C _{oss}	Output Capacitance				800	pF
C _{rss}	Reverse Transfer Capacitance				250	pF

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
t _{d(on)}	Turn-on Time	V _{DD} = 25 V I _D = 20 A R _G = 50 Ω V _{GS} = 5 V (see test circuit, figure 3)		30		ns
t _r	Rise Time			300		ns
(di/dt) _{on}	Turn-on Current Slope	V _{DD} = 40 V I _D = 40 A R _G = 50 Ω V _{GS} = 5 V (see test circuit, figure 5)		100		A/μs
Q _g	Total Gate Charge	V _{DD} = 40 V I _D = 40 A V _{GS} = 5 V		30		nC

ELECTRICAL CHARACTERISTICS (continued)**SWITCHING OFF**

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{r(Voff)}$	Off-voltage Rise Time	$V_{DD} = 40\text{ V}$ $I_D = 40\text{ A}$		180		ns
t_f	Fall Time	$R_G = 50\ \Omega$ $V_{GS} = 5\text{ V}$		200		ns
t_c	Cross-over Time	(see test circuit, figure 5)		380		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				40	A
$I_{SDM}(\bullet)$	Source-drain Current (pulsed)				160	A
$V_{SD}(\ast)$	Forward On Voltage	$I_{SD} = 40\text{ A}$ $V_{GS} = 0$			2	V
t_{rr}	Reverse Recovery Time	$I_{SD} = 40\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$ $V_{DD} = 25\text{ V}$ $T_j = 150\text{ }^\circ\text{C}$ (see test circuit, figure 5)		100		ns
Q_{rr}	Reverse Recovery Charge			0.3		μC
I_{RRM}	Reverse Recovery Current			6		A

(*) Pulsed: Pulse duration = 300 μs , duty cycle 1.5 %

(\bullet) Pulse width limited by safe operating area