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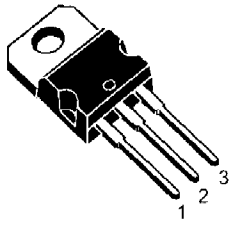
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MTP3055E

N - CHANNEL 60V - 0.1Ω - 12A TO-220
STripFET™ MOSFET

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
MTP3055E	60 V	< 0.15 Ω	12 A

- TYPICAL $R_{DS(on)}$ = 0.1 Ω
- AVALANCHE RUGGED TECHNOLOGY
- 100% AVALANCHE TESTED
- 175°C OPERATING TEMPERATURE
- APPLICATION ORIENTED CHARACTERIZATION

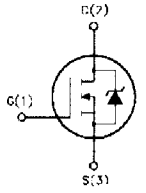


TO-220

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
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	± 20	V
I_D	Drain Current (continuous) at T_c = 25 °C	12	A
I_{DM}	Drain Current (pulsed) at T_c = 100 °C	9	A
I_{DM}(•)	Drain Current (pulsed)	48	A
P_{tot}	Total Dissipation at T_c = 25 °C	40	W
T_{stg}	Storage Temperature	-65 to 175	°C
T_j	Max. Operating Junction Temperature	175	°C

(•) Pulse width limited by safe operating area
First digit of the datecode being Z or K identifies silicon characterized in this datasheet.

NJ Semi-Conductors reserves the right to change test conditions, parameter limits and package dimensions without notice. Information furnished by NJ Semi-Conductors is believed to be both accurate and reliable at the time of going to press. However, NJ Semi-Conductors assumes no responsibility for any errors or omissions discovered in its use. NJ Semi-Conductors encourages customers to verify that datasheets are current before placing orders.

Quality Semi-Conductors

THERMAL DATA

$R_{thj\text{-}case}$	Thermal Resistance Junction-case	Max	3.75	°C/W
$R_{thj\text{-}amb}$	Thermal Resistance Junction-ambient	Max	62.5	oC/W
$R_{thc\text{-}s}$	Thermal Resistance Case-sink	Typ	0.5	°C/W
T_l	Maximum Lead Temperature For Soldering Purpose		300	°C

AVALANCHE CHARACTERISTICS

Symbol	Parameter	Max Value	Unit
I_{AR}	Avalanche Current, Repetitive or Not-Repetitive (pulse width limited by T_j max)	12	A
E_{AS}	Single Pulse Avalanche Energy (starting T_J = 25 °C, I_D = I_{AR}, V_{DD} = 25 V)	50	mJ

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			1 10	µA µA
I_{GSS}	Gate-body Leakage Current (V_{DS} = 0)	V_{GS} = ± 20 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	2	2.9	4	V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 10V I_D = 7 A		0.1	0.15	Ω
$I_{D(on)}$	On State Drain Current	V_{DS} > $I_{D(on)}$ x $R_{DS(on)max}$ V_{GS} = 10 V	12			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 = 6 A	4	6		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{DS} = 25 V f = 1 MHz V_{GS} = 0		760 100 30		pF pF pF

ELECTRICAL CHARACTERISTICS (continued)

SWITCHING RESISTIVE LOAD

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Time	V_{DD} = 30 V I_D = 7 A		20		ns
t_r	Rise Time	R_G = 50 Ω V_{GS} = 10 V		65		ns
$t_{d(off)}$	Turn-off Delay Time	(see test circuit)		70		ns
t_f	Fall Time			35		ns
Q_g	Total Gate Charge	I_D = 12 A V_{GS} = 10 V		15		nC
Q_{gs}	Gate-Source Charge	V_{DD} = 40 V		7		nC
Q_{gd}	Gate-Drain Charge	(see test circuit)		5		nC

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain Current				12	A
I_{SDM}(•)	Source-drain Current (pulsed)				48	A
V_{SD} (*)	Forward On Voltage	I_{SD} = 12 A V_{GS} = 0			2.0	V
t_{rr}	Reverse Recovery Time	I_{SD} = 12 A di/dt = 100 A/µs V_{DD} = 30 V T_j = 150 °C		65		ns
Q_{rr}	Reverse Recovery Charge			0.17		µC

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

(•) Pulse width limited by safe operating area