

## N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

TYPE	V <sub>DSS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
BUZ72A	100 V	0.25 Ω	9 A

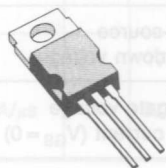
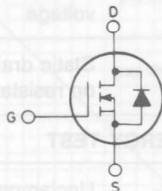
- 100 VOLTS - FOR UPS APPLICATIONS
- ULTRA FAST SWITCHING
- RATED FOR UNCLAMPED INDUCTIVE SWITCHING (ENERGY TEST) ♦
- EASY DRIVE - FOR REDUCED SIZE AND COST

**INDUSTRIAL APPLICATIONS:**

- UNINTERRUPTIBLE POWER SUPPLIES
- MOTOR CONTROLS

N - channel enhancement mode POWER MOS field effect transistor. Easy drive and very fast switching times make this POWER MOS transistor ideal for high speed switching application.

Typical applications include UPS, battery changers, printer hammer drivers, solenoid drivers and motor control.


**TO-220**
**INTERNAL SCHEMATIC  
DIAGRAM**

**ABSOLUTE MAXIMUM RATINGS**

V <sub>DS</sub>	Drain-source voltage (V <sub>GS</sub> = 0)	100	V
V <sub>DGR</sub>	Drain-gate voltage (R <sub>GS</sub> = 20 KΩ)	100	V
V <sub>GS</sub>	Gate-source voltage	±20	V
I <sub>D</sub>	Drain current (continuous) T <sub>c</sub> = 25°C	9	A
I <sub>DM</sub>	Drain current (pulsed)	36	A
P <sub>tot</sub>	Total dissipation at T <sub>c</sub> < 25°C	40	W
T <sub>stg</sub>	Storage temperature	-55 to 150	°C
T <sub>j</sub>	Max. operating junction temperature	150	°C
	DIN humidity category (DIN 40040)	E	
	IEC climatic category (DIN IEC 68-1)	55/150/56	

♦ Introduced in 1989 week 1

## THERMAL DATA

$R_{thj-case}$	Thermal resistance junction-case	max	3.1	°C/W
$R_{thj-amb}$	Thermal resistance junction-ambient	max	75	°C/W

ELECTRICAL CHARACTERISTICS ( $T_j = 25^\circ\text{C}$  unless otherwise specified)

Parameters	Test Conditions	Min.	Typ.	Max.	Unit
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## OFF

$V_{(BR)DSS}$	Drain-source breakdown voltage	$I_D = 250 \mu\text{A}$	$V_{GS} = 0$	100		V
$I_{DSS}$	Zero gate voltage drain current ( $V_{GS} = 0$ )	$V_{DS} = \text{Max Rating}$	$V_{DS} = \text{Max Rating}$			250 $\mu\text{A}$ 1000 $\mu\text{A}$
$I_{GSS}$	Gate-body leakage current ( $V_{DS} = 0$ )	$V_{GS} = \pm 20 \text{ V}$				$\pm 100 \text{ nA}$

## ON

$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}$	$I_D = 1 \text{ mA}$	2.1		4 V
$R_{DS(on)}$	Static drain-source on resistance	$V_{GS} = 10 \text{ V}$	$I_D = 5 \text{ A}$			0.25 $\Omega$

## ENERGY TEST

$I_{UIS}$	Unclamped inductive switching current (single pulse)	$V_{DD} = 30 \text{ V}$ starting $T_j = 25^\circ\text{C}$	$L = 100 \mu\text{H}$	9		A
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## DYNAMIC

$g_{fs}$	Forward transconductance	$V_{DS} = 25 \text{ V}$	$I_D = 5 \text{ A}$	2.7		mho
$C_{iss}$	Input capacitance	$V_{DS} = 25 \text{ V}$	$f = 1 \text{ MHz}$			600 pF
$C_{oss}$	Output capacitance	$V_{GS} = 0$				240 pF
$C_{rss}$	Reverse transfer capacitance					130 pF

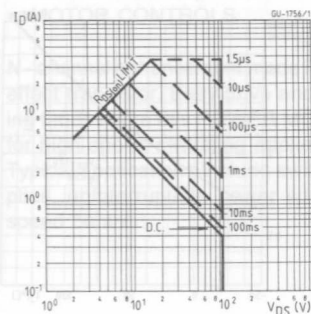
## SWITCHING

$t_{d(on)}$	Turn-on time	$V_{DD} = 30 \text{ V}$	$I_D = 2.9 \text{ A}$			30 ns
$t_r$	Rise time	$R_{GS} = 50 \Omega$	$V_{GS} = 10 \text{ V}$			70 ns
$t_{d(off)}$	Turn-off delay time					90 ns
$t_f$	Fall time					70 ns

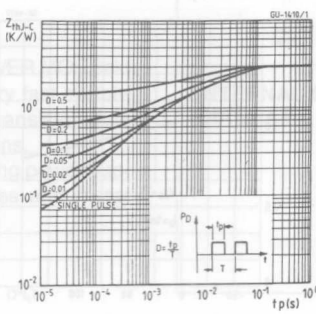
ELECTRICAL CHARACTERISTICS (Continued)

Parameters		Test Conditions		Min.	Typ.	Max.	Unit
$I_{SD}$	Source-drain current	$T_c = 25^\circ\text{C}$				9	A
$I_{SDM}$	Source-drain current (pulsed)					36	A
$V_{SD}$	Forward on voltage	$I_{SD} = 18\text{ A}$	$V_{GS} = 0$			2	V
$t_{rr}$	Reverse recovery time				170		ns
$Q_{rr}$	Reverse recovered charge	$I_{SD} = 9\text{ A}$	$di/dt = 100\text{A}/\mu\text{s}$		0.30		$\mu\text{C}$

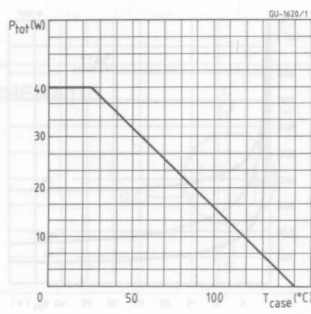
Safe operating areas



Thermal impedance

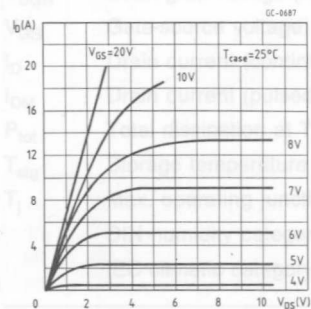


Derating curve

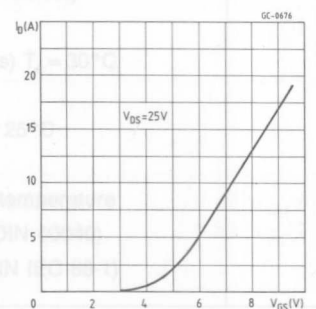


ABSOLUTE MAXIMUM RATINGS

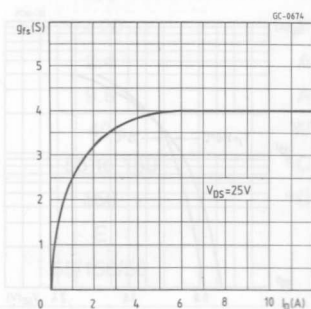
Output characteristics



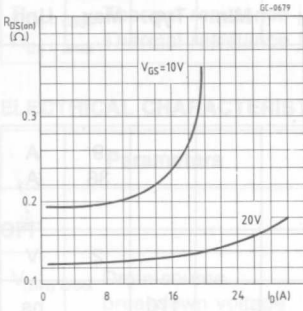
Transfer characteristics



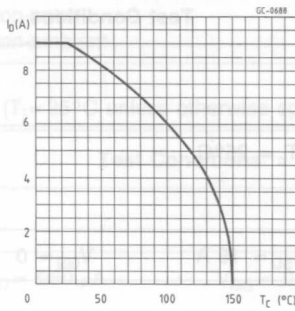
Transconductance



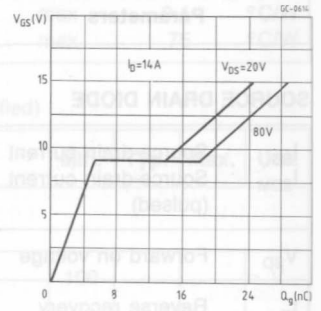
Static drain-source on resistance



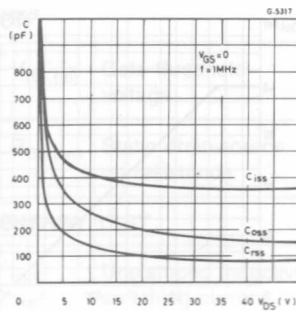
Maximum drain current vs temperature



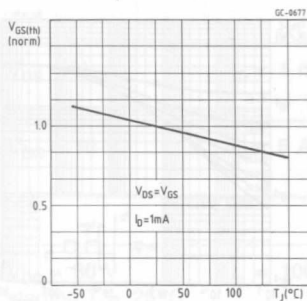
Gate charge vs gate-source voltage



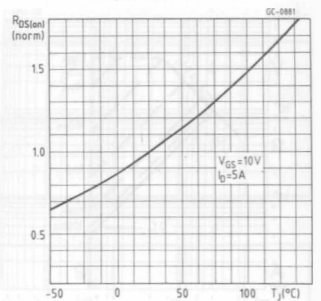
Capacitance variation



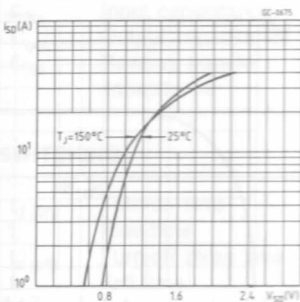
Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics



Transfer characteristics



Output characteristics

