

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

TYPE	V _{DSS}	R _{DS(on)}	I _D
BUZ21	100 V	0.1 Ω	19 A

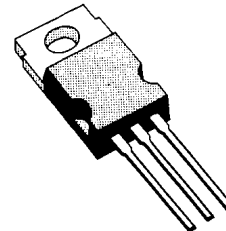
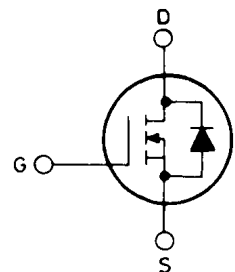
- 100 VOLTS - FOR DC/DC CONVERTERS
- HIGH CURRENT
- RATED FOR UNCLAMPED INDUCTIVE SWITCHING (ENERGY TEST) ♦
- ULTRA FAST SWITCHING
- EASY DRIVE -FOR REDUCED COST AND SIZE

INDUSTRIAL APPLICATIONS:

- UNINTERRUPTABLE 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 applications.

Typical applications include DC/DC converters, UPS, battery chargers, secondary regulators servo control, audio power amplifiers and robotics.


TO-220
**INTERNAL SCHEMATIC
DIAGRAM**

ABSOLUTE MAXIMUM RATINGS

V _{DS}	Drain-source voltage (V _{GS} = 0)	100	V
V _{DGR}	Drain-gate voltage (R _{GS} = 20 KΩ)	100	V
V _{GS}	Gate-source voltage	±20	V
I _D	Drain current (continuous) T _c = 30°C	19	A
I _{DM}	Drain current (pulsed)	75	A
P _{tot}	Total dissipation at T _c < 25°C	75	W
T _{stg}	Storage temperature	- 55 to 150	°C
T _j	Max. operating junction temperature	150	°C
	DIN humidity category (DIN 40040)	E	
	IEC climatic category (DIN IEC 68-1)	55/150/56	

♦ Introduced in 1988 week 44

THERMAL DATA

$R_{thj - case}$	Thermal resistance junction-case	max	1.67	°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 ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$ $V_{DS} = \text{Max Rating}$	$T_j = 125^\circ\text{C}$		250 1000	μA μA
I_{GSS}	Gate-body leakage current ($V_{DS} = 0$)	$V_{GS} = \pm 20 \text{ V}$			± 100	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	$V_{GS} = 10 \text{ V}$	$I_D = 9 \text{ A}$			0.1	Ω

ENERGY TEST

I_{UIS}	Unclamped inductive switching current (single pulse)	$V_{DD} = 30 \text{ V}$ starting $T_j = 25^\circ\text{C}$	$L = 100 \mu\text{H}$	19			A
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DYNAMIC

g_{fs}	Forward transconductance	$V_{DS} = 25 \text{ V}$	$I_D = 9 \text{ A}$	4.0			mho
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$	$f = 1 \text{ MHz}$			2000 700 240	pF pF pF

SWITCHING

$t_{d (on)}$ t_r $t_{d (off)}$ t_f	Turn-on time Rise time Turn-off delay time Fall time	$V_{DD} = 30 \text{ V}$ $R_{GS} = 50 \Omega$	$I_D = 3 \text{ A}$ $V_{GS} = 10 \text{ V}$			45 75 220 110	ns ns ns ns
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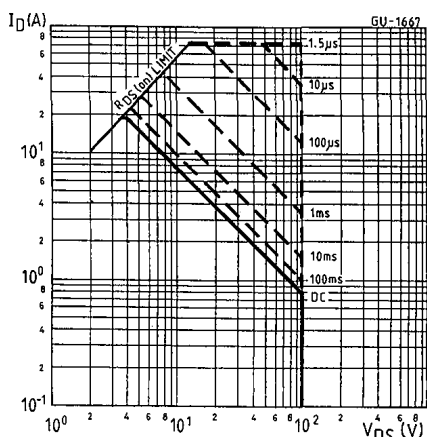
ELECTRICAL CHARACTERISTICS (Continued)

Parameters	Test Conditions	Min.	Typ.	Max.	Unit
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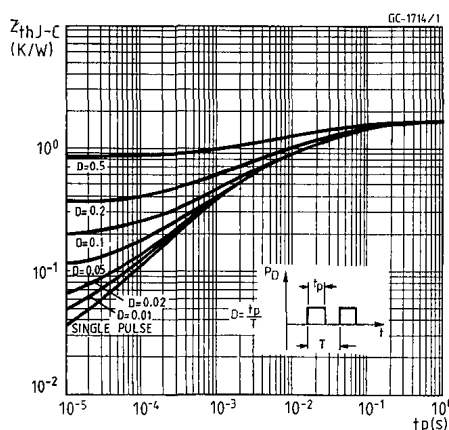
SOURCE DRAIN DIODE

I_{SD} I_{SDM}	Source-drain current Source-drain current (pulsed)	$T_c = 25^\circ\text{C}$		19 75	A A
V_{SD}	Forward on voltage	$I_{SD} = 38\text{ A}$	$V_{GS} = 0$	2.1	V
t_{rr}	Reverse recovery time			200	ns
Q_{rr}	Reverse recovered charge	$I_{SD} = 19\text{ A}$	$di/dt = 100\text{A}/\mu\text{s}$	0.25	μC

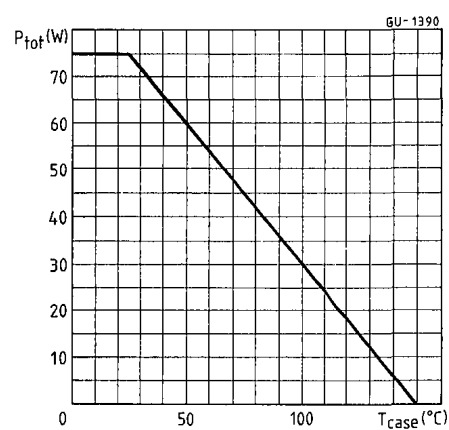
Safe operating areas



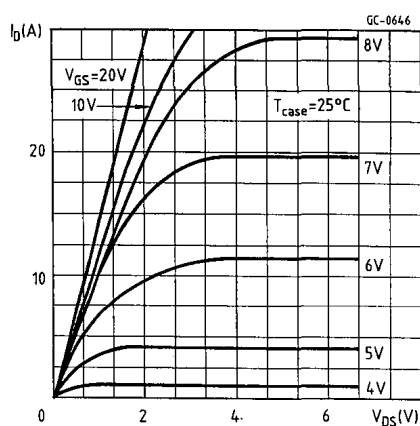
Thermal impedance



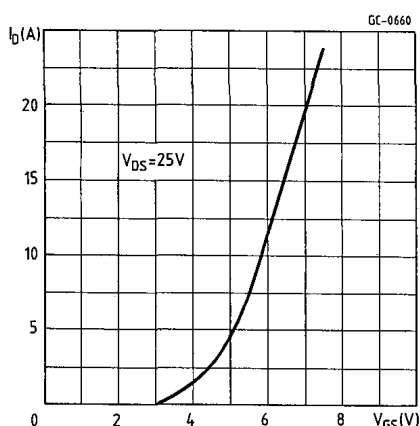
Derating curve



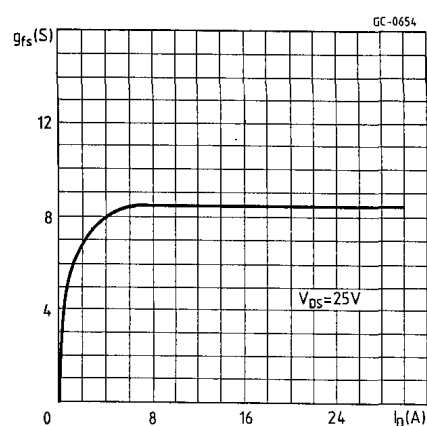
Output characteristics



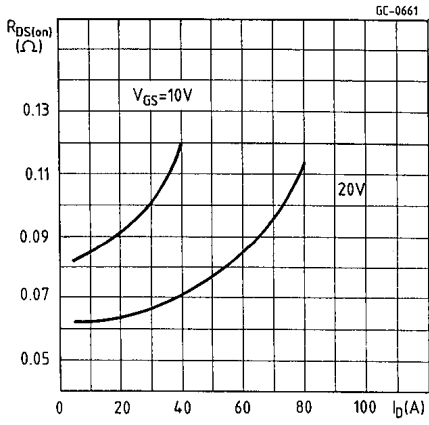
Transfer characteristics



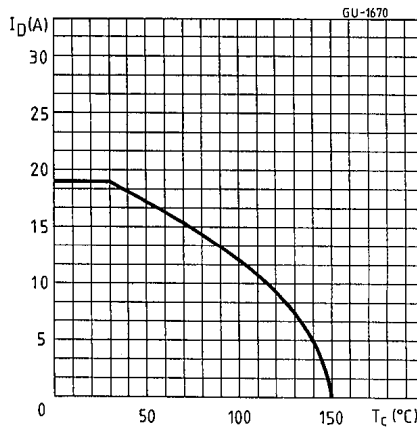
Transconductance



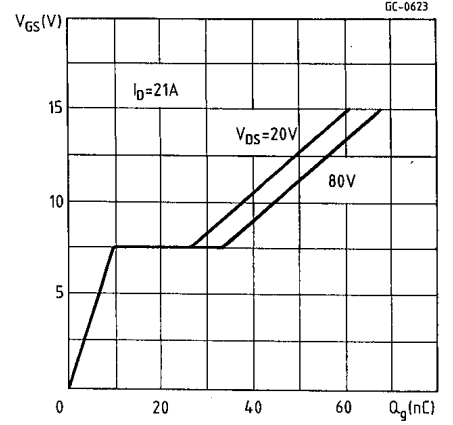
Static drain-source on resistance



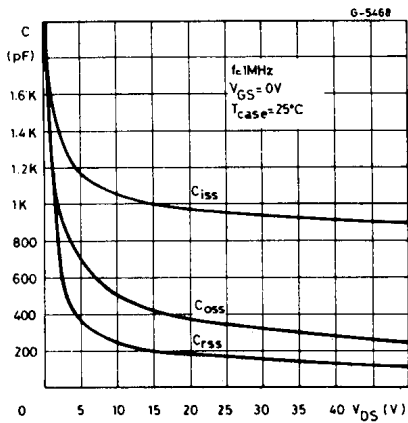
Maximum drain current vs temperature



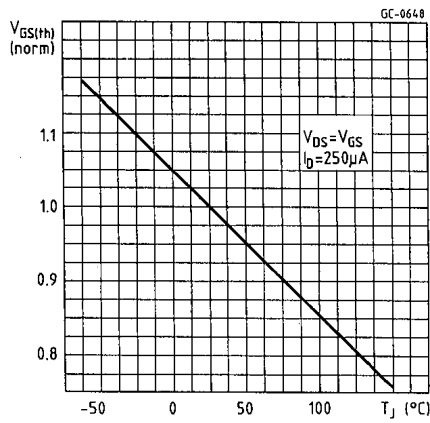
Gate charge vs gate-source voltage



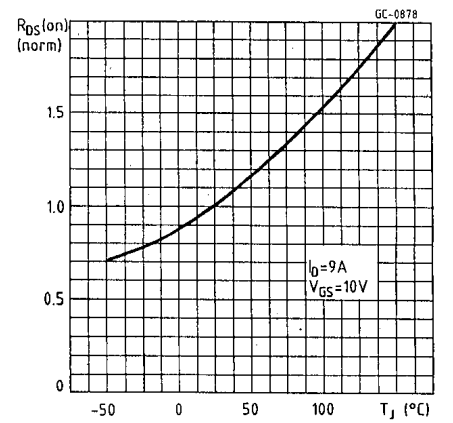
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics

