SGS-THOMSON MICROELECTRONICS 742-478

BUZ21

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

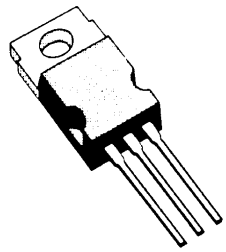
TYPE	V_{DSS}	$R_{DS(on)}$	I_D
BUZ21	100 V	0.1 Ω	19 A

- 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:

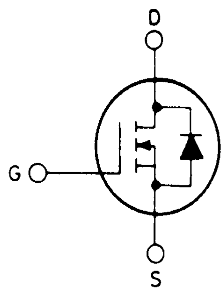
- UNINTERRUPTABLE POWER SUPPLIES
- MOTOR CONTROLS

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

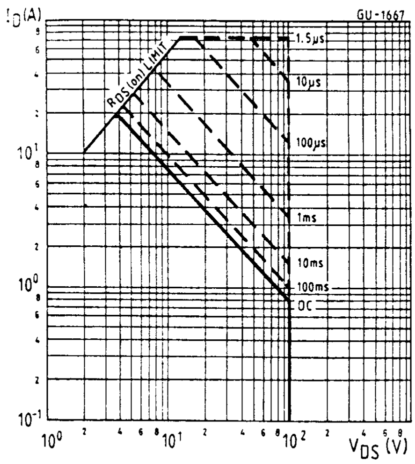
ELECTRICAL CHARACTERISTICS ($T_j = 25°C$ unless otherwise specified)

Parameters		Test Conditions		Min.	Typ.	Max.	Unit
OFF							
$V_{(BR)DSS}$	Drain-source breakdown voltage	I_D = 250 μA	V_{GS} = 0	100			V
I_{DSS}	Zero gate voltage drain current (V_{GS} = 0)	V_{DS} = Max Rating V_{DS} = Max Rating	 T_j = 125°C			250 1000	μA μA
I_{GSS}	Gate-body leakage current (V_{DS} = 0)	V_{GS} = ±20 V				±100	nA
ON							
$V_{GS(th)}$	Gate threshold voltage	V_{DS} = V_{GS}	I_D = 1 mA	2.1		4	V
$R_{DS(on)}$	Static drain-source on resistance	V_{GS} = 10 V	I_D = 9 A			0.1	Ω
ENERGY TEST							
I_{UIS}	Unclamped inductive switching current (single pulse)	V_{DD} = 30 V starting T_j = 25°C	L = 100 μH	19			A
DYNAMIC							
g_{fs}	Forward transconductance	V_{DS} = 25 V	I_D = 9 A	4.0			mho
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	V_{DS} = 25 V V_{GS} = 0	f = 1 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 V R_{GS} = 50 Ω	I_D = 3 A V_{GS} = 10 V			45 75 220 110	ns ns ns ns

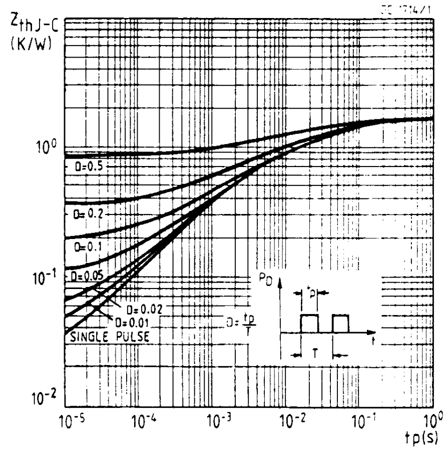
ELECTRICAL CHARACTERISTICS (Continued)

Parameters		Test Conditions	Min.	Typ.	Max.	Unit
SOURCE DRAIN DIODE						
I_{SD}	Source-drain current	$T_c = 25°C$			19	A
I_{SDM}	Source-drain current (pulsed)				75	A
V_{SD}	Forward on voltage	$I_{SD} = 38$ A $V_{GS} = 0$			2.1	V
t_{rr}	Reverse recovery time	$I_{SD} = 19$ A di/dt = 100A/μs		200		ns
Q_{rr}	Reverse recovered charge			0.25		μC

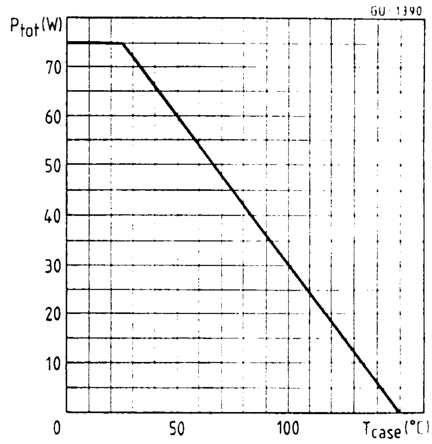
Safe operating areas



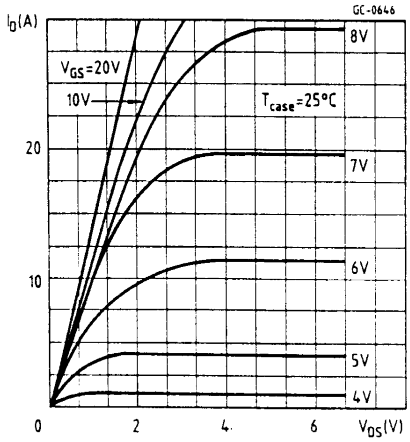
Thermal impedance



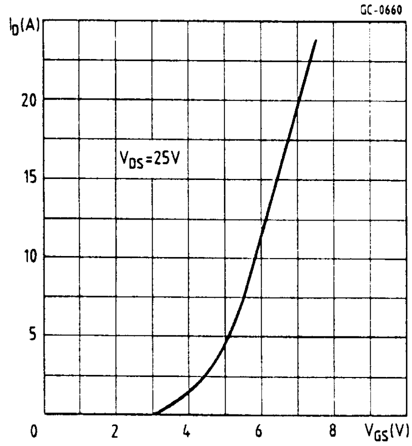
Derating curve



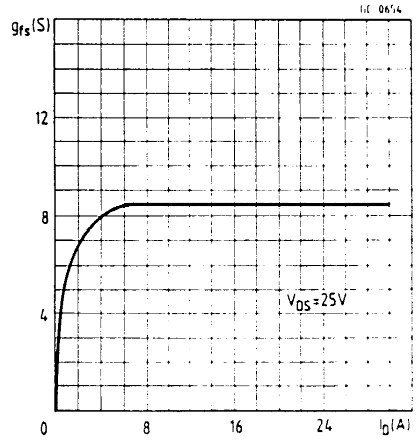
Output characteristics



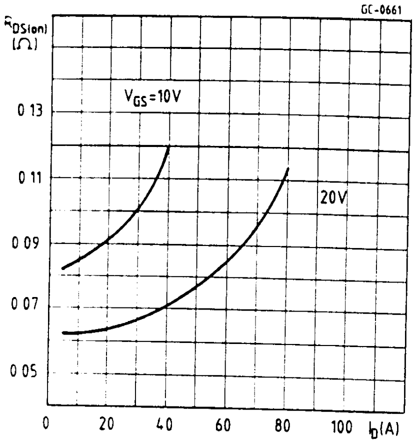
Transfer characteristics



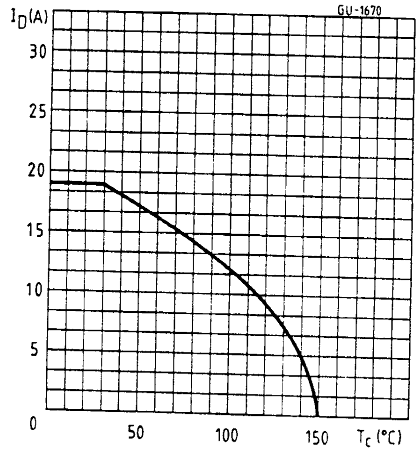
Transconductance



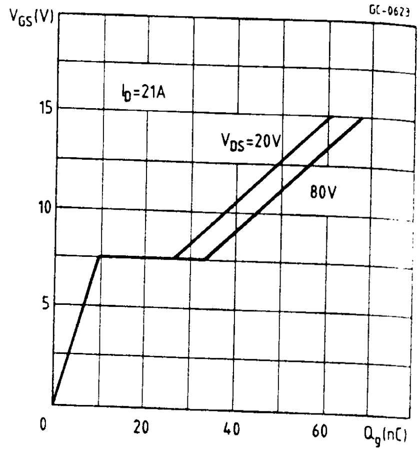
Static drain-source on resistance



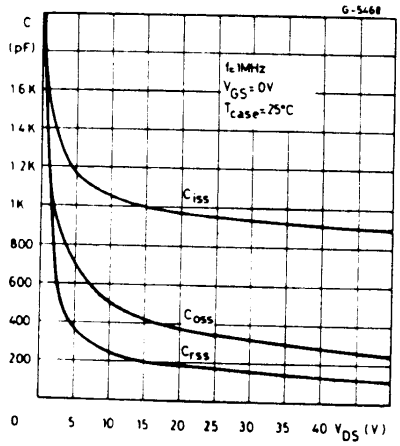
Maximum drain current vs temperature



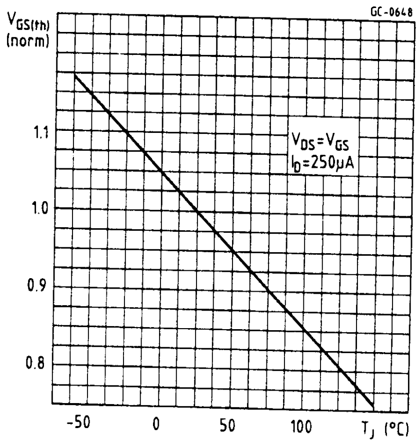
Gate charge vs gate-source voltage



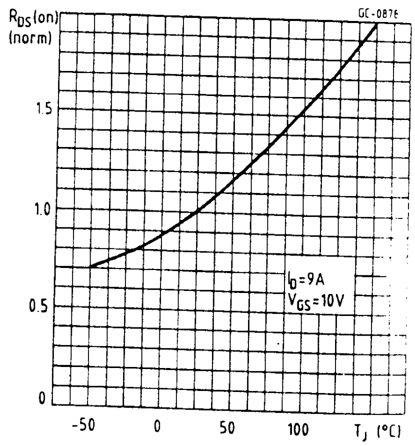
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics