SGS-THOMSON MICROELECTRONICS

BUZ20

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

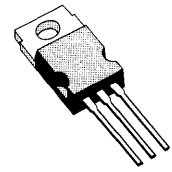
TYPE	V_{DSS}	$R_{DS(on)}$	I_D
BUZ20	100 V	0.2 Ω	12 A

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

INDUSTRIAL APPLICATIONS:

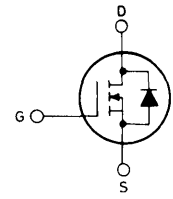
- UNINTERRUPTIBLE POWER SUPPLIES
- MOTOR CONTROLS

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



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 = 25°C	12	A
I_{DM}	Drain current (pulsed)	48	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

$R_{thj\text{ - }case}$	Thermal resistance junction-case	max	1.67	°C/W
$R_{thj\text{ - }amb}$	Thermal resistance junction-ambient	max	75	°C/W

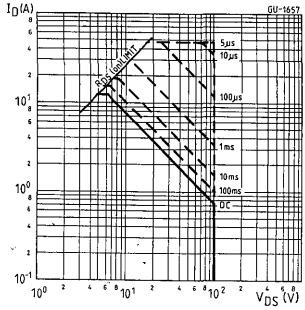
ELECTRICAL CHARACTERISTICS ($T_j = 25°C$ unless otherwise specified)

Parameters		Test Conditions		Min.	Typ.	Max.	Unit
OFF							
$V_{(BR)\ DSS}$	Drain-source breakdown voltage	$I_D = 250\ \mu A$	$V_{GS} = 0$	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 ($V_{DS} = 0$)	$V_{GS} = \pm 20$ 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	$I_D = 6$ A			0.2	Ω
ENERGY TEST							
I_{UIS}	Unclamped inductive switching current (single pulse)	$V_{DD} = 30$ V starting $T_j = 25°C$	$L = 100\ \mu H$	12			A
DYNAMIC							
g_{fs}	Forward transconductance	$V_{DS} = 25$ V	$I_D = 6$ A	2.7			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 500 140	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 $R_{GS} = 50\ \Omega$	$I_D = 2.9$ A $V_{GS} = 10$ V			45 75 140 80	ns ns ns ns

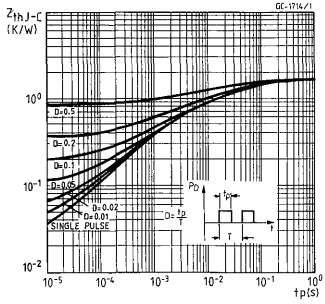
ELECTRICAL CHARACTERISTICS (Continued)

Parameters		Test Conditions		Min.	Typ.	Max.	Unit
SOURCE DRAIN DIODE							
I_{SD} I_{SDM}	Source-drain current Source-drain current (pulsed)	T_c = 25°C				12 48	A A
V_{SD}	Forward on voltage	I_{SD} = 24 A	V_{GS} = 0			1.8	V
t_{rr}	Reverse recovery time	I_{SD} = 12 A	di/dt = 100A/μs		200		ns
Q_{rr}	Reverse recovered charge				1.6		μC

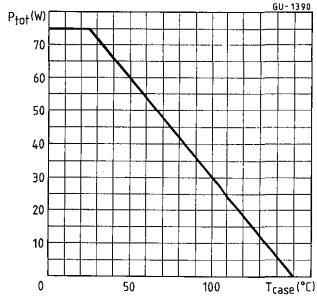
Safe operating areas



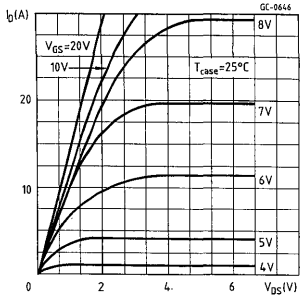
Thermal impedance



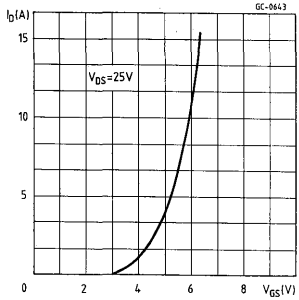
Derating curve



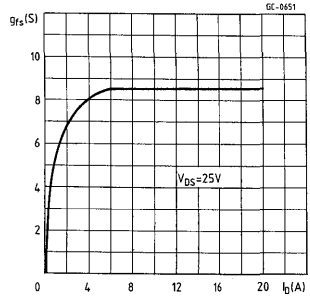
Output characteristics



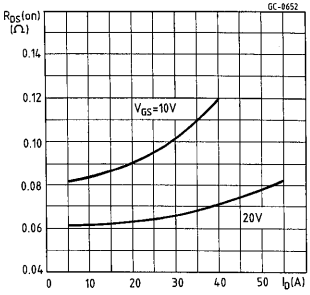
Transfer characteristics



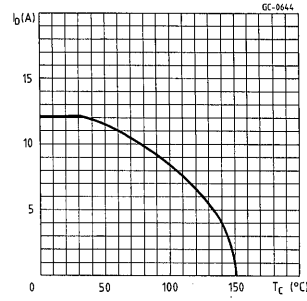
Transconductance



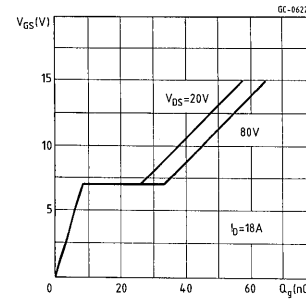
Static drain-source on resistance



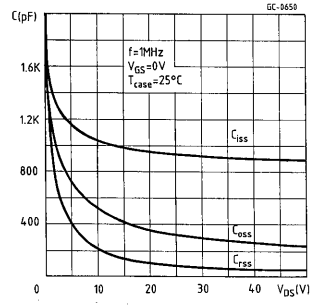
Maximum drain current vs temperature



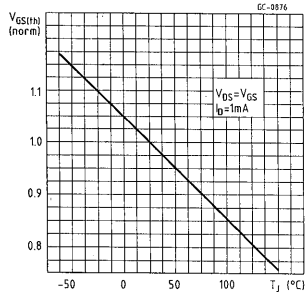
Gate charge vs gate-source voltage



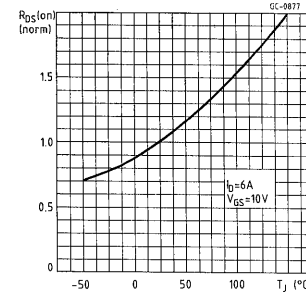
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics