SGS-THOMSON MICROELECTRONICS

BUZ42

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

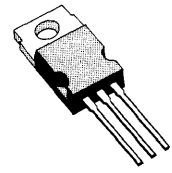
TYPE	V_{DSS}	$R_{DS(on)}$	I_D
BUZ42	500 V	2 Ω	4 A

- HIGH VOLTAGE - FOR OFF-LINE SMPS
- ULTRA FAST SWITCHING FOR OPERATION AT < 100KHz
- EASY DRIVE - FOR REDUCED COST AND SIZE

INDUSTRIAL APPLICATIONS:

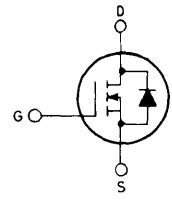
- SWITCHING POWER SUPPLIES
- MOTOR CONTROLS

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 switching power supplies and motor speed control.



TO-220

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

V_{DS}	Drain-source voltage ($V_{GS} = 0$)	500	V
V_{DGR}	Drain-gate voltage ($R_{GS} = 20$ KΩ)	500	V
V_{GS}	Gate-source voltage	±20	V
I_D	Drain current (continuous) $T_c = 30°C$	4	A
I_{DM}	Drain current (pulsed)	16	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	

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

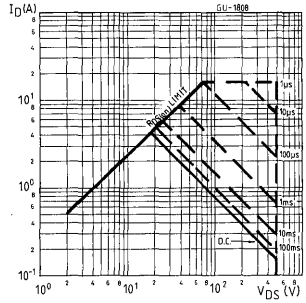
ELECTRICAL CHARACTERISTICS (T_j = 25°C unless otherwise specified)

Parameters		Test Conditions		Min.	Typ.	Max.	Unit
OFF							
$V_{(BR)\ DSS}$	Drain-source breakdown voltage	I_D = 250 μA	V_{GS} = 0	500			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 = 2.5 A			2	Ω
DYNAMIC							
g_{fs}	Forward transconductance	V_{DS} = 25 V	I_D = 2.5 A	1.5			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 170 70	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 = 2.5 A V_{GS} = 10 V			45 60 140 65	ns ns ns ns

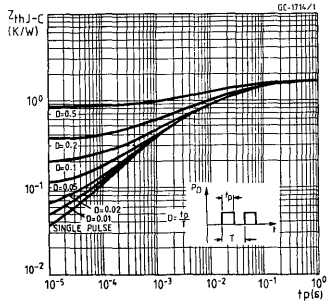
ELECTRICAL CHARACTERISTICS (Continued)

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				4 16	A A
V_{SD}	Forward on voltage	I_{SD} = 8 A	V_{GS} = 0			1.5	V
t_{rr} Q_{rr}	Reverse recovery time Reverse recovered charge	I_{SD} = 4 A	di/dt = 100A/μs		1200 6		ns μC

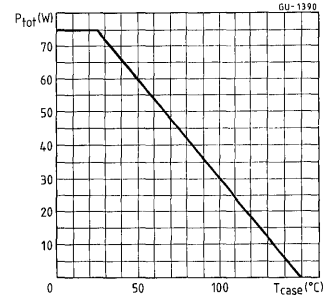
Safe operating areas



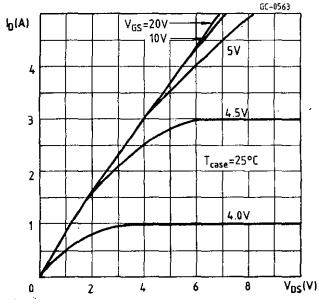
Thermal impedance



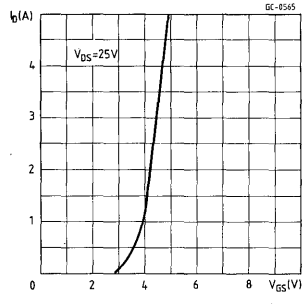
Derating curve



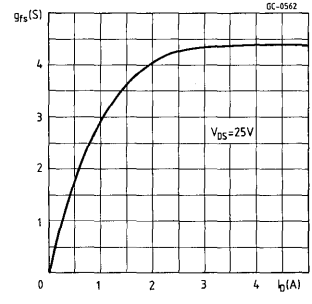
Output characteristics



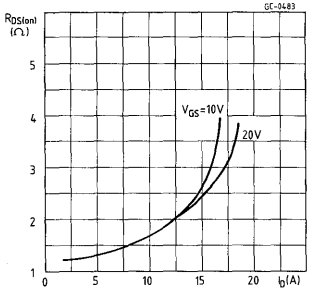
Transfer characteristics



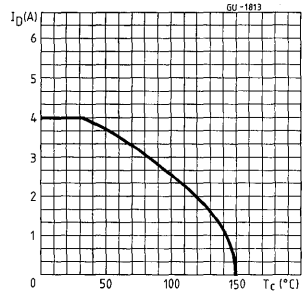
Transconductance



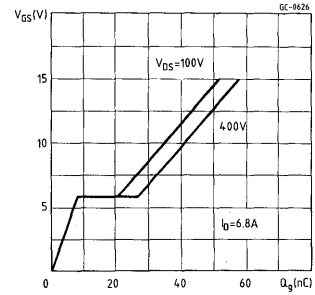
Static drain-source on resistance



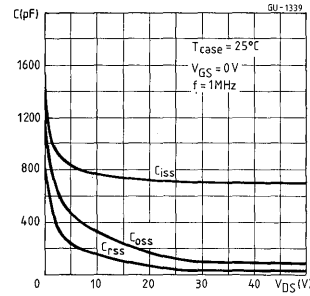
Maximum drain current vs temperature



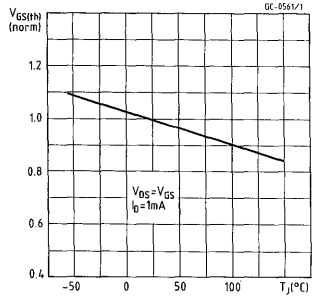
Gate charge vs gate-source voltage



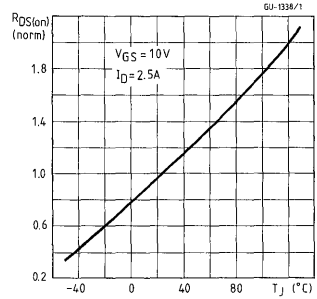
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics