

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR

TYPE	V _{DSS}	R _{DS(on)}	I _D
BUZ42	500 V	2 Ω	4 A

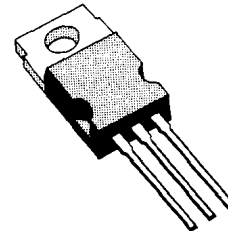
- HIGH VOLTAGE - FOR OFF-LINE SMPS
- ULTRA FAST SWITCHING FOR OPERATION AT < 100KHz
- EASY DRIVE - FOR REDUCED COST AND SIZE

INDUSTRIAL APPLICATIONS:

- SWITCHING POWER SUPPLIES
- MOTOR CONTROLS

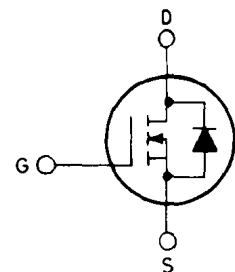
N - channel enhancement mode POWER MOS field effect transistor. Easy drive and very fast switching times make this POWER MOS transistor ideal for high speed switching applications.

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

$R_{thj - case}$	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	$I_D = 250 \mu\text{A}$	$V_{GS} = 0$	500			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	$V_{GS} = 10 \text{ V}$	$I_D = 2.5 \text{ A}$			2	Ω

DYNAMIC

g_{fs}	Forward transconductance	$V_{DS} = 25 \text{ V}$	$I_D = 2.5 \text{ A}$	1.5			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 170 70	pF pF pF

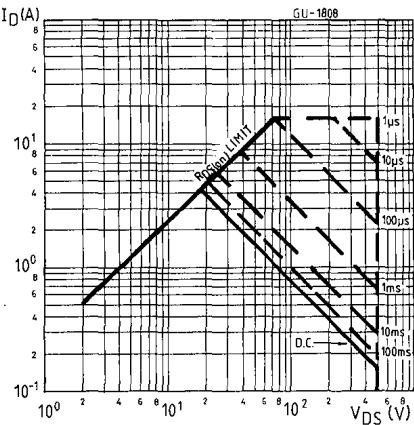
SWITCHING

$t_{d(on)}$	Turn-on time	$V_{DD} = 30 \text{ V}$	$I_D = 2.5 \text{ A}$			45	ns
t_r	Rise time	$R_{GS} = 50 \Omega$	$V_{GS} = 10 \text{ V}$			60	ns
$t_{d(off)}$	Turn-off delay time					140	ns
t_f	Fall time					65	ns

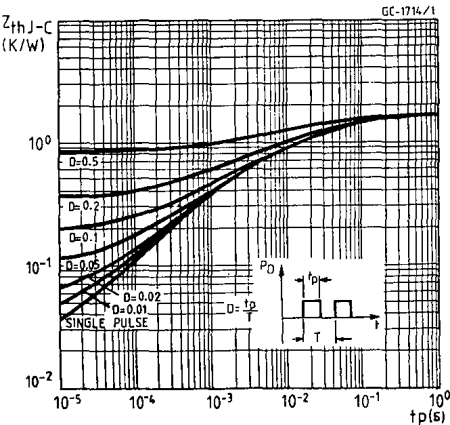
ELECTRICAL CHARACTERISTICS (Continued)

Parameters	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM} Source-drain current Source-drain current (pulsed)	$T_c = 25^\circ\text{C}$			4 16	A A
V_{SD} Forward on voltage	$I_{SD} = 8\text{ A}$ $V_{GS} = 0$			1.5	V
t_{rr} Reverse recovery time			1200		ns
Q_{rr} Reverse recovered charge	$I_{SD} = 4\text{ A}$ $di/dt = 100\text{ A}/\mu\text{s}$		6		μC

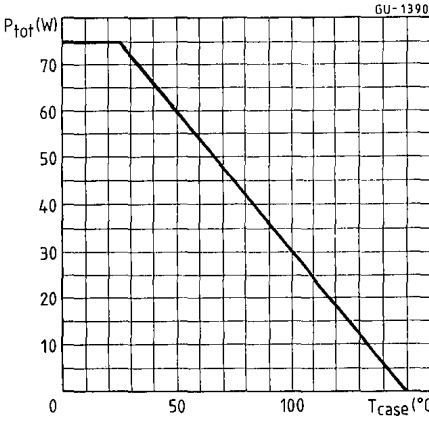
Safe operating areas



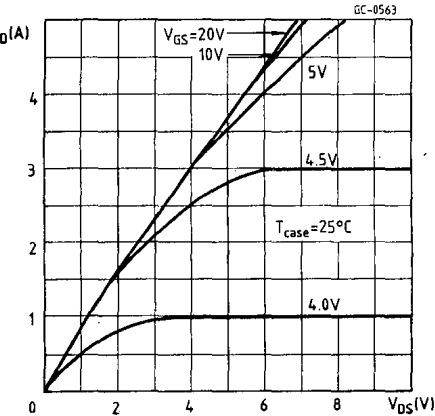
Thermal impedance



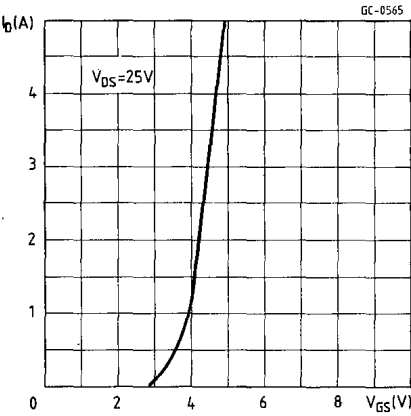
Derating curve



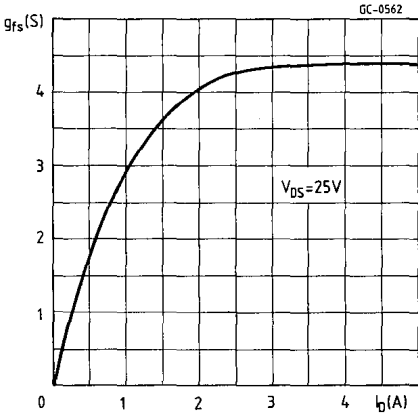
Output characteristics



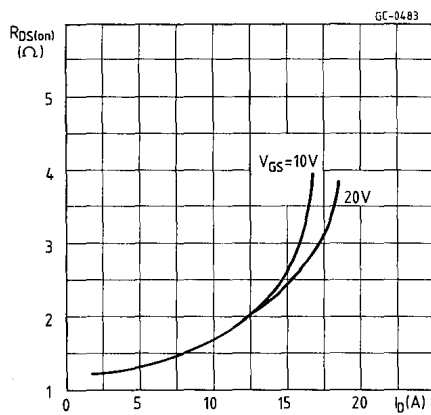
Transfer characteristics



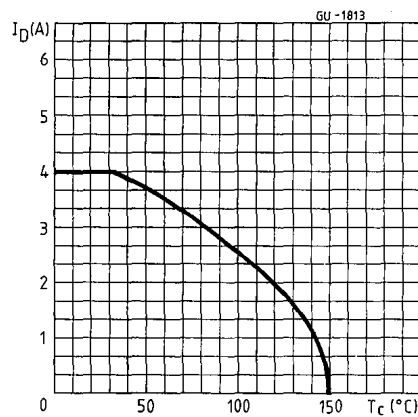
Transconductance



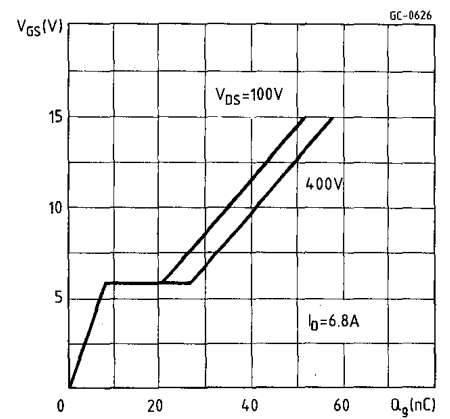
Static drain-source on resistance



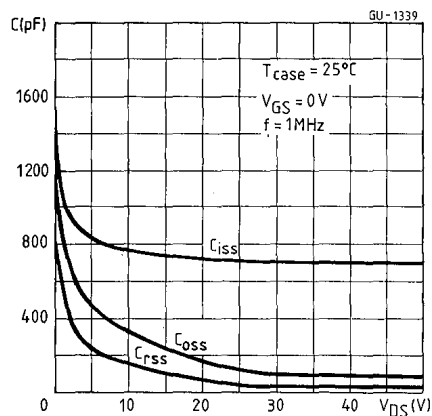
Maximum drain current vs temperature



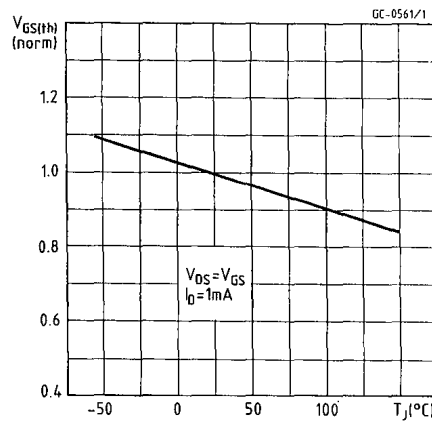
Gate charge vs gate-source voltage



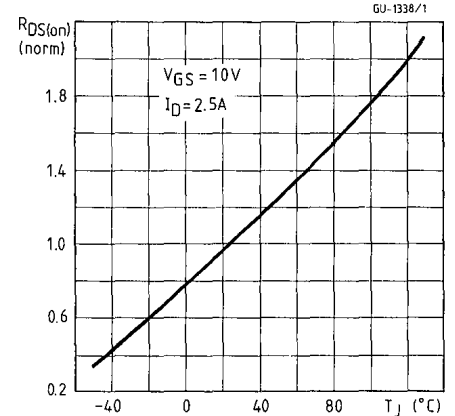
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics

