

**N - CHANNEL ENHANCEMENT MODE  
 POWER MOS TRANSISTOR**

TYPE	V <sub>DSS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
BUZ45A	500 V	0.8 Ω	8.3 A

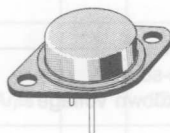
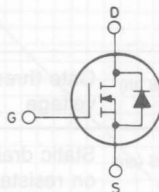
- HIGH VOLTAGE - FOR OFF-LINE SMPS
- ULTRA FAST SWITCHING FOR OPERATION AT < 100KHz
- EASY DRIVE - FOR REDUCED COST AND SIZE

**INDUSTRIAL APPLICATIONS:**

- SWITCH MODE 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, uninterruptable power supplies and motor speed control.


**TO-3**
**INTERNAL SCHEMATIC  
 DIAGRAM**

**ABSOLUTE MAXIMUM RATINGS**

V <sub>DS</sub>	Drain-source voltage (V <sub>GS</sub> = 0)	500	V
V <sub>DGR</sub>	Drain-gate voltage (R <sub>GS</sub> = 20 KΩ)	500	V
V <sub>GS</sub>	Gate-source voltage	± 20	V
I <sub>D</sub>	Drain current (continuous) T <sub>c</sub> = 25°C	8.3	A
I <sub>DM</sub>	Drain current (pulsed)	33	A
P <sub>tot</sub>	Total dissipation at T <sub>c</sub> < 25°C	125	W
T <sub>stg</sub>	Storage temperature	- 55 to 150	°C
T <sub>j</sub>	Max. operating junction temperature	150	°C
	DIN humidity category (DIN 40040)	C	
	IEC climatic category (DIN IEC 68-1)	55/150/56	

## THERMAL DATA

$R_{thj - case}$	Thermal resistance junction-case	max	1.0	°C/W
$R_{thj - amb}$	Thermal resistance junction-ambient	max	35	°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 ( $V_{GS} = 0$ )	$V_{DS} = \text{Max Rating}$	$T_j = 125^\circ\text{C}$		250	$\mu\text{A}$
		$V_{DS} = \text{Max Rating}$			1000	$\mu\text{A}$
$I_{GSS}$	Gate-body leakage current ( $V_{DS} = 0$ )	$V_{GS} = \pm 20 \text{ V}$			$\pm 100$	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	$V_{GS} = 10 \text{ V}$	$I_D = 5 \text{ A}$		0.8	$\Omega$

## DYNAMIC

$g_{fs}$	Forward transconductance	$V_{DS} = 25 \text{ V}$	$I_D = 5 \text{ A}$	2.7		mho
$C_{iss}$	Input capacitance				4900	pF
$C_{oss}$	Output capacitance	$V_{DS} = 25 \text{ V}$	$f = 1 \text{ MHz}$		400	pF
$C_{rss}$	Reverse transfer capacitance	$V_{GS} = 0$			170	pF

## SWITCHING

$t_d (on)$	Turn-on time	$V_{DD} = 30 \text{ V}$	$I_D = 2.8 \text{ A}$	75	ns
$t_r$	Rise time	$R_{GS} = 50 \Omega$	$V_{GS} = 10 \text{ V}$	120	ns
$t_d (off)$	Turn-off delay time			430	ns
$t_f$	Fall time			140	ns

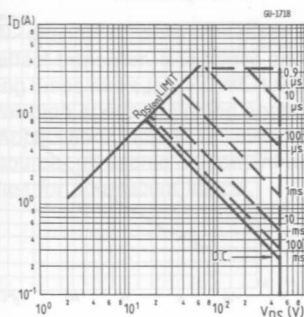
ELECTRICAL CHARACTERISTICS (Continued)

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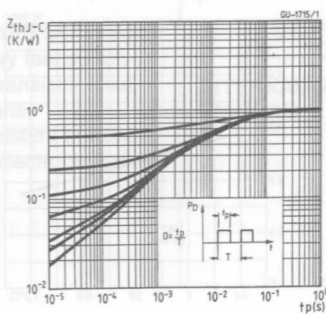
SOURCE DRAIN DIODE

$I_{SD}$	Source-drain current	$T_c = 25^\circ\text{C}$		8.3	A
$I_{SDM}$	Source-drain current (pulsed)			33	A
$V_{SD}$	Forward on voltage	$I_{SD} = 16.6\text{ A}$	$V_{GS} = 0$	1.6	V
$t_{rr}$	Reverse recovery time			1200	ns
$Q_{rr}$	Reverse recovered charge	$I_{SD} = 8.3\text{ A}$	$di/dt = 100\text{A}/\mu\text{s}$	12	$\mu\text{C}$

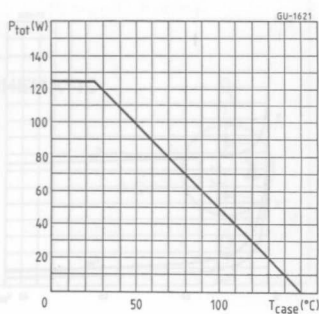
Safe operating areas



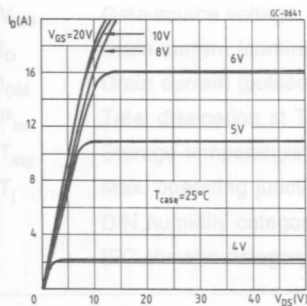
Thermal impedance



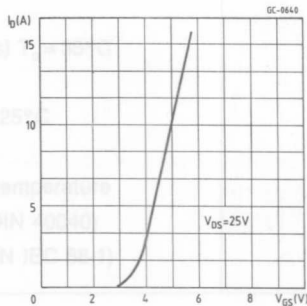
Derating curve



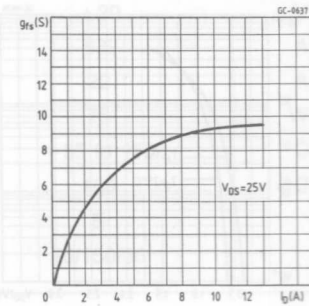
Output characteristics



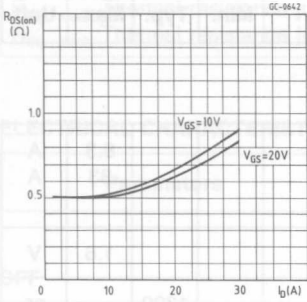
Transfer characteristics



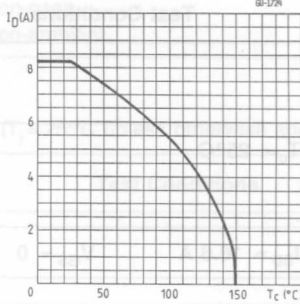
Transconductance



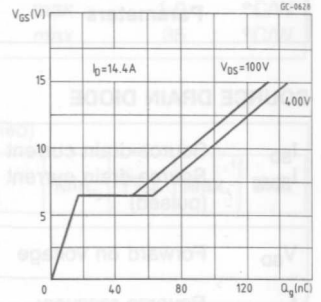
Static drain-source on resistance



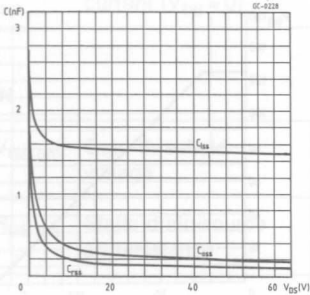
Maximum drain current vs temperature



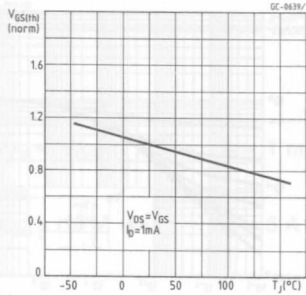
Gate charge vs gate-source voltage



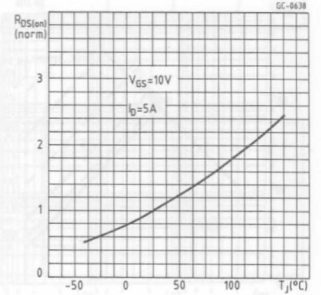
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics

