

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

SGS-THOMSON

30E D

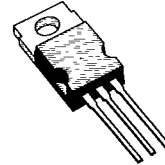
TYPE	V _{DSS}	R _{DS(on)}	I _D
BUZ20	100 V	0.2 Ω	12 A

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

INDUSTRIAL APPLICATIONS:

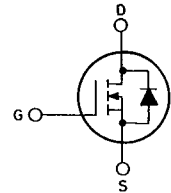
- UNINTERRUPTIBLE POWER SUPPLIES
- MOTOR CONTROLS

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

$R_{thj - case}$	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	$I_D = 250 \mu\text{A}$	$V_{GS} = 0$	100		V
I_{DSS}	Zero gate voltage drain current ($V_{GS} = 0$)	$V_{DS} = \text{Max Rating}$	$V_{DS} = \text{Max Rating}$			250 μA 1000 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	$V_{GS} = 10 \text{ V}$	$I_D = 6 \text{ A}$			0.2 Ω

ENERGY TEST

I_{UIS}	Unclamped inductive switching current (single pulse)	$V_{DD} = 30 \text{ V}$ starting $T_J = 25^\circ\text{C}$	$L = 100 \mu\text{H}$	12		A
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DYNAMIC

g_{fs}	Forward transconductance	$V_{DS} = 25 \text{ V}$	$I_D = 6 \text{ A}$	2.7		mho
C_{iss}	Input capacitance	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$	$f = 1 \text{ MHz}$			2000 pF
C_{oss}	Output capacitance					500 pF
C_{rss}	Reverse transfer capacitance					140 pF

SWITCHING

$t_{d (on)}$	Turn-on time	$V_{DD} = 30 \text{ V}$ $R_{GS} = 50 \Omega$	$I_D = 2.9 \text{ A}$			45 ns
t_r	Rise time		$V_{GS} = 10 \text{ V}$			75 ns
$t_{d (off)}$	Turn-off delay time					140 ns
t_f	Fall time					80 ns

ELECTRICAL CHARACTERISTICS (Continued)

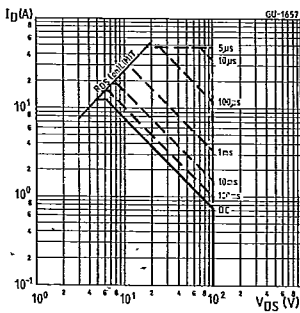
Parameters	Test Conditions	Min.	Typ.	Max.	Unit
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T-39-11

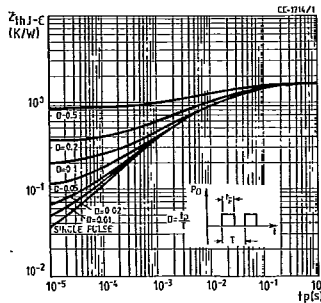
SOURCE DRAIN DIODE

I_{SD}	Source-drain current	$T_c = 25^\circ C$			12	A
I_{SDM}	Source-drain current (pulsed)				48	A
V_{SD}	Forward on voltage	$I_{SD} = 24 A$	$V_{GS} = 0$		1.8	V
t_{rr}	Reverse recovery time	$I_{SD} = 12 A$	$di/dt = 100A/\mu s$		200	ns
Q_{rr}	Reverse recovered charge				1.6	μC

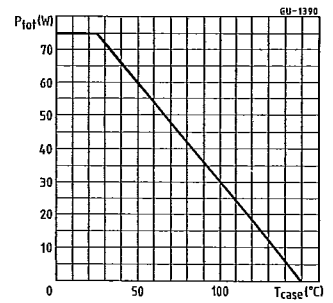
Safe operating areas



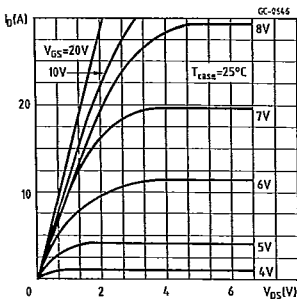
Thermal impedance



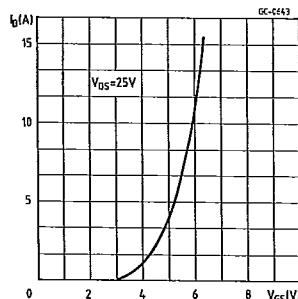
Derating curve



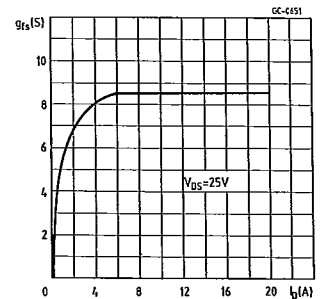
Output characteristics



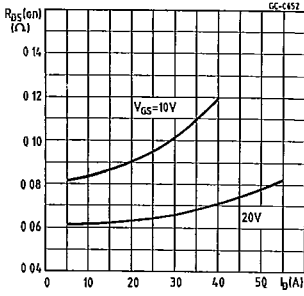
Transfer characteristics



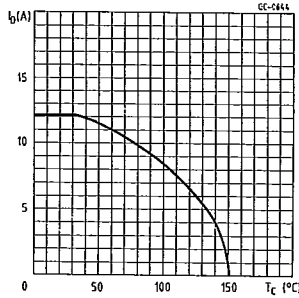
Transconductance



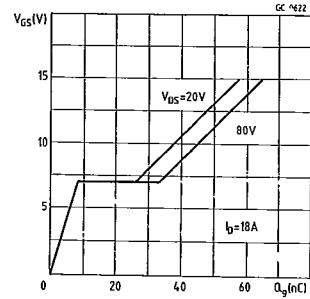
Static drain-source on resistance



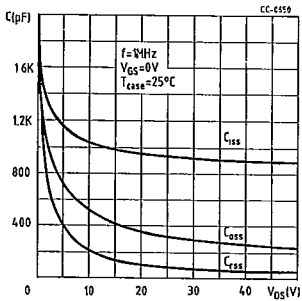
Maximum drain current vs temperature



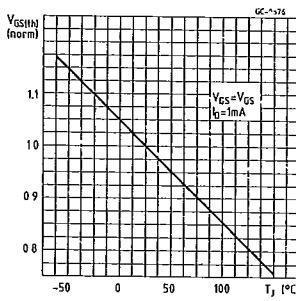
Gate charge vs gate-source voltage



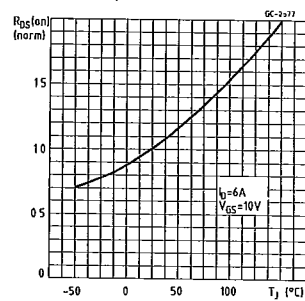
Capacitance variation



Gate threshold voltage vs temperature



Drain-source on resistance vs temperature



Source-drain diode forward characteristics

