

## N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTOR MODULE

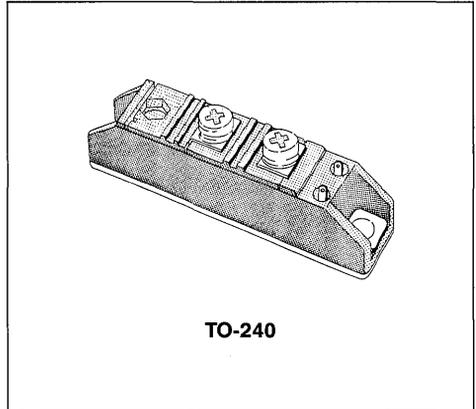
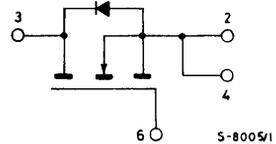
TYPE	V <sub>DSS</sub>	R <sub>DS(on)</sub>	I <sub>D</sub>
SGS35MA050D1	500 V	0.16 Ω	35 A

- ISOLATED POWERMOS MODULE
- HIGH POWER
- FAST SWITCHING
- EASY DRIVE
- EASY TO PARALLEL

**INDUSTRIAL APPLICATIONS:**

- SWITCHING MODE POWER SUPPLIES
- UNINTERRUPTIBLE POWER SUPPLIES

N - channel enhancement mode POWER MOS field effect transistor. Easy drive and fast switching of this TRANSPACK module make it ideal for high power, high speed switching applications. Typical applications include DC motor control (variable frequency control) switching mode power supplies, uninterruptible power supplies, DC/DC convertors and high frequency welding equipment. The large RBSOA and absence of second breakdown in POWER MOS make this TRANSPACK module very rugged. This, together with the isolated package with its optimised thermal performance, make this module extremely effective in high power applications.


**TO-240**
**INTERNAL SCHEMATIC  
DIAGRAM**


S-8005/1

**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 (cont.) at T <sub>c</sub> =25°C	35	A
I <sub>D</sub>	Drain current (cont.) at T <sub>c</sub> =100°C	22	A
I <sub>DM</sub>	Drain current (pulsed)	140	A
P <sub>tot</sub>	Total dissipation at T <sub>c</sub> < 25°C	400	W
	Derating factor	3.2	W/°C
T <sub>stg</sub>	Storage temperature	-65 to 150	°C
T <sub>j</sub>	Max. operating junction temperature	150	°C
V <sub>ISO</sub>	Insulation withstand voltage (AC)	2500	V

**THERMAL DATA**

$R_{thj - case}$	Thermal resistance junction-case	max	0.31	°C/W
$R_{thc - h}$	Thermal resistance case-heatsink	max	0.20	°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	$I_D = 2 \text{ mA}$	$V_{GS} = 0$	500		V
$I_{DSS}$	Zero gate voltage drain current ( $V_{GS} = 0$ )	$V_{DS} = \text{Max Rating}$ $V_{DS} = \text{Max Rating} \times 0.8$ $T_j = 125^\circ\text{C}$			500 2	$\mu\text{A}$ mA
$I_{GSS}$	Gate-body leakage current ( $V_{DS} = 0$ )	$V_{GS} = \pm 20 \text{ V}$			$\pm 500$	nA

**ON\***

$V_{GS (th)}$	Gate threshold voltage	$V_{DS} = V_{GS}$	$I_D = 2 \text{ mA}$	2		4	V
$R_{DS (on)}$	Static drain-source on resistance	$V_{GS} = 10 \text{ V}$	$I_D = 17.5 \text{ A}$			0.16	$\Omega$

**DYNAMIC**

$g_{fs}$	Forward transconductance	$V_{DS} = 25 \text{ V}$	$I_D = 17.5 \text{ A}$	15			mho
$C_{iss}$	Input capacitance	$V_{DS} = 25 \text{ V}$ $V_{GS} = 0$				12000	pF
$C_{oss}$	Output capacitance					1500	pF
$C_{rss}$	Reverse transfer capacitance					1000	pF

**SWITCHING**

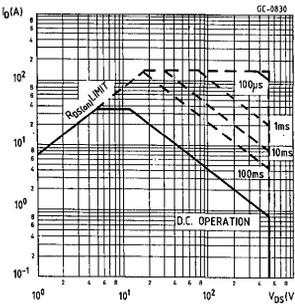
$t_{d (on)}$	Turn-on time	$V_{DD} = 250 \text{ V}$	$I_D = 17.5 \text{ A}$		120	ns
$(di/dt)_{on}$	Turn-on current slope	$R_i = 50 \Omega$	$V_i = 10 \text{ V}$		100	A/ $\mu\text{s}$
$t_{d (off)}$	Turn-off delay time				1.5	$\mu\text{s}$
$t_f$	Fall time				300	ns

ELECTRICAL CHARACTERISTICS (Continued)

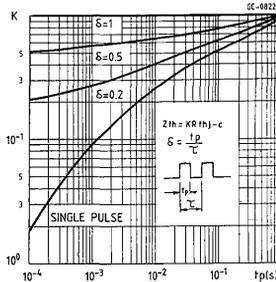
Parameters	Test Conditions	Min.	Typ.	Max.	Unit
$I_{SD}$ $I_{SDM}$	Source-drain current Source-drain current (pulsed)			35 140	A A
$V_{SD}$	Forward on voltage	$I_{SD} = 35\text{ A}$	$V_{GS} = 0$	2	V
$t_{rr}$	Reverse recovery time	$I_{SD} = 35\text{ A}$	$di/dt = 150\text{ A}/\mu\text{s}$	600	ns

\* Pulsed: Pulse duration  $\leq 300\ \mu\text{s}$ , duty cycle  $\leq 2\%$

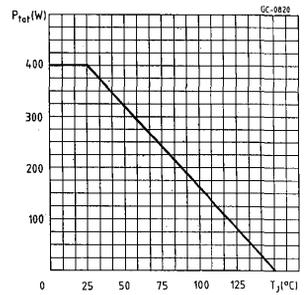
Safe operating areas



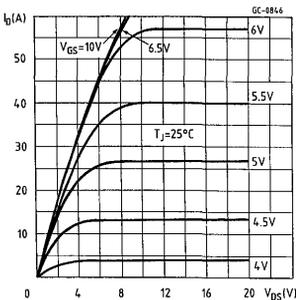
Thermal impedance



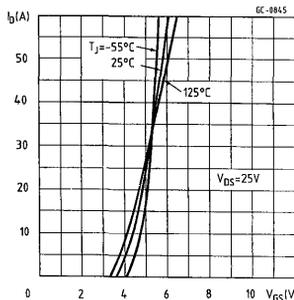
Derating curve



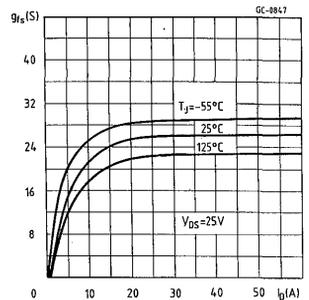
Output characteristics



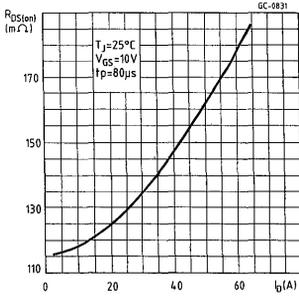
Transfer characteristics



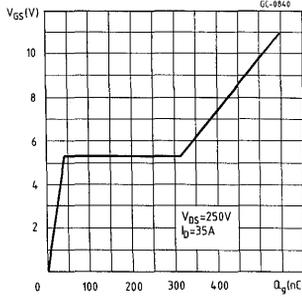
Transconductance



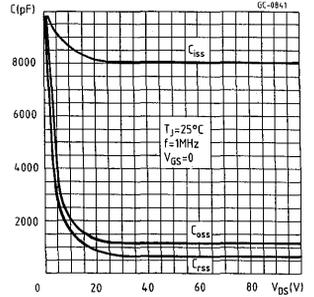
Static drain-source on resistance



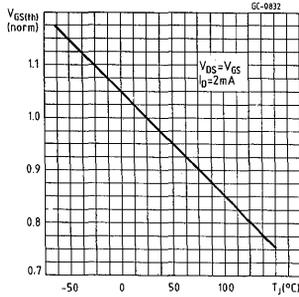
Gate charge vs gate-source voltage



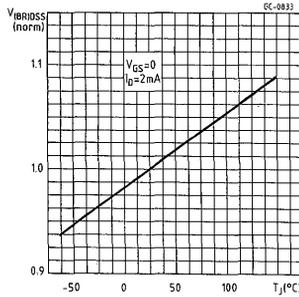
Capacitance variation



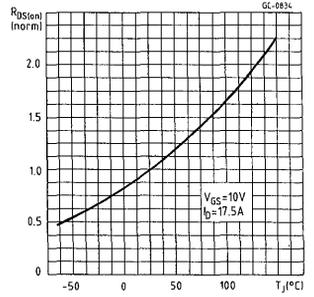
Normalized gate threshold voltage vs temperature



Normalized breakdown voltage vs temperature



Normalized on resistance vs temperature



Source-drain diode forward characteristics

