SGS-THOMSON
MICROELECTRONICS

SGSP363
SGSP367

N - CHANNEL ENHANCEMENT MODE POWER MOS TRANSISTORS

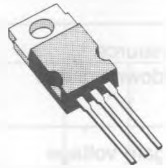
TYPE	V_{DSS}	$R_{DS(on)}$	I_D
SGSP363	250 V	0.45 Ω	10 A
SGSP367	200 V	0.33 Ω	12 A

- HIGH SPEED SWITCHING APPLICATIONS
- TELECOMMUNICATION APPLICATIONS
- RATED FOR UNCLAMPED INDUCTIVE SWITCHING (ENERGY TEST) ◆
- ULTRA FAST SWITCHING
- EASY DRIVE FOR REDUCED COST AND SIZE

INDUSTRIAL APPLICATIONS:

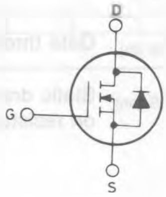
- ROBOTICS
- SWITCHING POWER SUPPLIES

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 robotics, uninterruptible power supplies, motor control and solenoid drives.



TO-220

INTERNAL SCHEMATIC DIAGRAM



ABSOLUTE MAXIMUM RATINGS

		SGSP363	SGSP367	
V_{DS}	Drain-source voltage ($V_{GS}=0$)	250	200	V
V_{DGR}	Drain-gate voltage ($R_{GS}=20$ KΩ)	250	200	V
V_{GS}	Gate-source voltage	± 20		V
I_D	Drain current (cont.) at $T_c=25°C$	10	12	A
I_D	Drain current (cont.) at $T_c=100°C$	6.3	7.5	A
I_{DM} (•)	Drain current (pulsed)	40	48	A
P_{tot}	Total dissipation at $T_c<25°C$	100		W
	Derating factor	0.8		W/°C
T_{stg}	Storage temperature	−65 to 150		°C
T_j	Max. operating junction temperature	150		°C

(•) Pulse width limited by safe operating area
◆ Introduced in 1989 week 1

THERMAL DATA

$R_{thj-case}$	Thermal resistance junction-case	max	1.25	°C/W
T_L	Maximum lead temperature for soldering purpose		275	°C

ELECTRICAL CHARACTERISTICS ($T_{case} = 25°C$ unless otherwise specified)

Parameters		Test Conditions	Min.	Typ.	Max.	Unit
OFF						
$V_{(BR)DSS}$	Drain-source breakdown voltage	$I_D = 250\ \mu A$ $V_{GS} = 0$ for **SGSP363** for **SGSP367**	 250 200			 V V
I_{DSS}	Zero gate voltage drain current ($V_{GS} = 0$)	$V_{DS} =$ Max Rating $V_{DS} =$ Max Rating x 0.8 $T_c = 125°C$			250 1000	μA μA
I_{GSS}	Gate-body leakage current ($V_{DS} = 0$)	$V_{GS} = \pm 20$ V			±100	nA
ON (*)						
$V_{GS(th)}$	Gate threshold voltage	$V_{DS} = V_{GS}$ $I_D = 250\ \mu A$	2		4	V
$R_{DS(on)}$	Static drain-source on resistance	$V_{GS} = 10$ V $I_D = 5$ A for **SGSP363** $I_D = 6$ A for **SGSP367** $V_{GS} = 10$ V $T_c = 100°C$ $I_D = 5$ A for **SGSP363** $I_D = 6$ A for **SGSP367**			 0.45 0.33 0.9 0.66	 Ω Ω Ω Ω
ENERGY TEST						
I_{UIS}	Unclamped inductive switching current (single pulse)	$V_{DD} = 30$ V $L = 100\ \mu H$ starting $T_j = 25°C$ for **SGSP363** for **SGSP367**	 10 12			 A A
DYNAMIC						
g_{fs}	Forward transconductance	$V_{DS} = 25$ V $I_D = 6$ A	3			mho
C_{iss} C_{oss} C_{rss}	Input capacitance Output capacitance Reverse transfer capacitance	$V_{DS} = 25$ V $f = 1$ MHz $V_{GS} = 0$		980	1200 260 100	pF pF pF

ELECTRICAL CHARACTERISTICS (Continued)

Parameters		Test Conditions	Min.	Typ.	Max.	Unit

SWITCHING

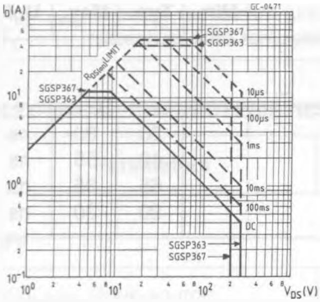
Parameters		Test Conditions	Min.	Typ.	Max.	Unit
$t_{d\ (on)}$	Turn-on time	V_{DD} = 100 V I_D = 6 A		20	30	ns
t_r	Rise time	V_i = 10 V R_i = 4.7 Ω		40	55	ns
$t_{d\ (off)}$	Turn-off delay time	(see test circuit)		65	85	ns
t_f	Fall time			20	30	ns

SOURCE DRAIN DIODE

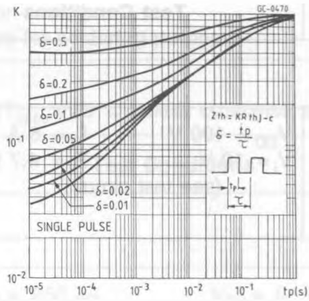
Parameters		Test Conditions	Min.	Typ.	Max.	Unit
I_{SD}	Source-drain current	for **SGSP363**			10	A
		for **SGSP367**			12	A
I_{SDM} (•)	Source-drain current (pulsed)	for **SGSP363**			40	A
		for **SGSP367**			48	A
V_{SD}	Forward on voltage	V_{GS} = 0				
		I_{SD} = 10 A for **SGSP363**			1.3	V
		I_{SD} = 12 A for **SGSP367**			1.3	V
t_{rr}	Reverse recovery time	I_{SD} = 12 A V_{GS} = 0 di/dt = 100 A/μs		250		ns

(*) Pulsed: Pulse duration = 300 μs, duty cycle 1.5%
(•) Pulse width limited by safe operating area

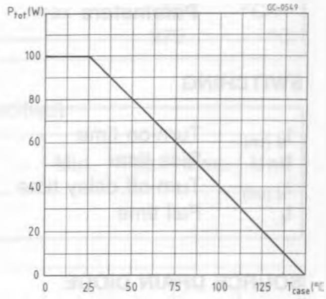
Safe operating areas



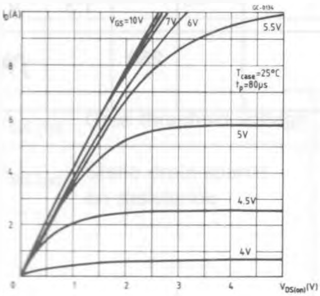
Thermal impedance



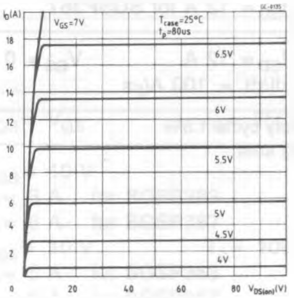
Derating curve



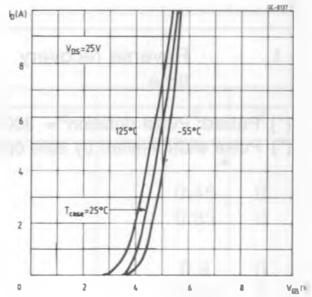
Output characteristics



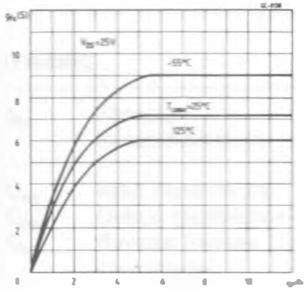
Output characteristics



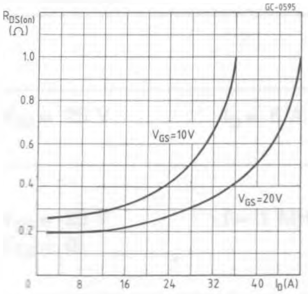
Transfer characteristics



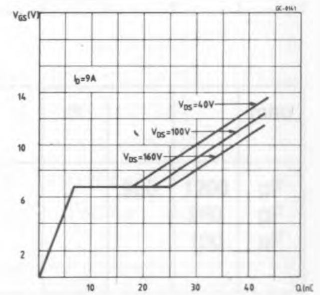
Transconductance



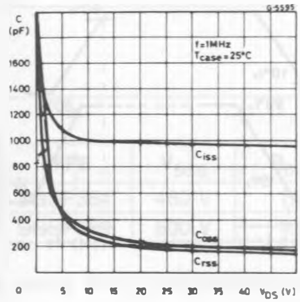
Static drain-source on resistance



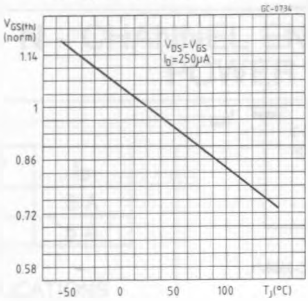
Gate charge vs gate-source voltage



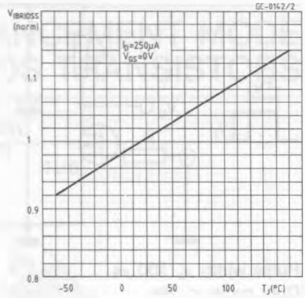
Capacitance variation



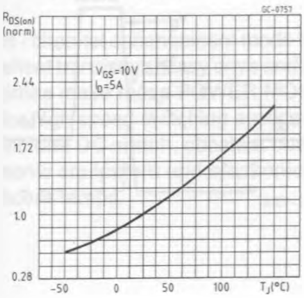
Normalized gate threshold voltage vs temperature



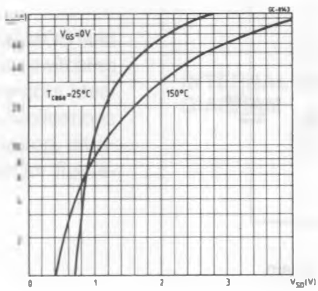
Normalized breakdown voltage vs temperature



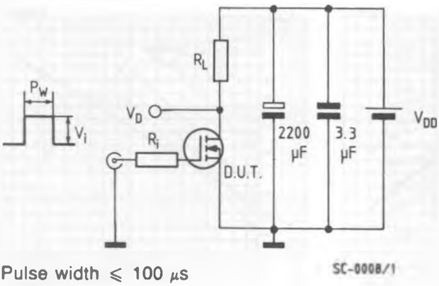
Normalized on resistance vs temperature



Source-drain diode forward characteristics

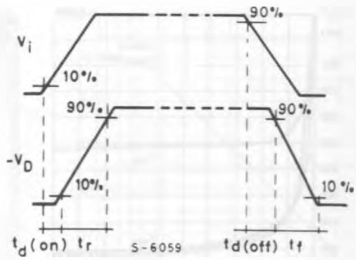


Switching times test circuit for resistive load

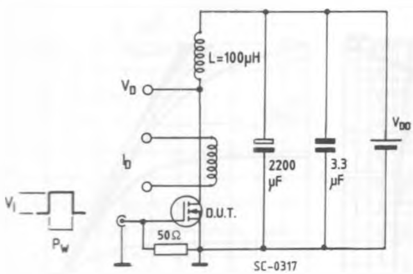


Pulse width ⩽ 100 µs
Duty cycle ⩽ 2%

Switching time waveforms for resistive load

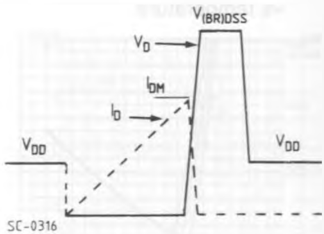


Unclamped inductive load test circuit

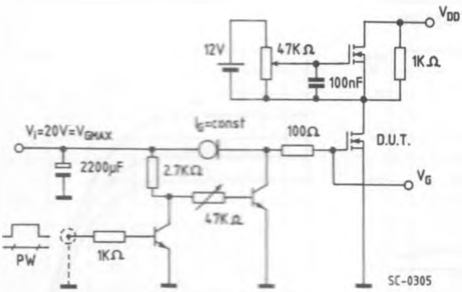


V_i = 12 V - Pulse width: adjusted to obtain specified I_{DM}

Unclamped inductive waveforms

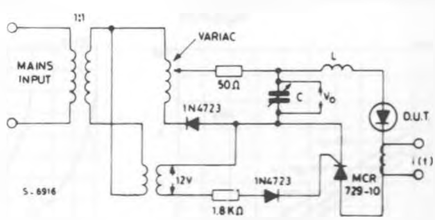


Gate charge test circuit



PW adjusted to obtain required V_G

Body-drain diode t_{rr} measurement
Jedec test circuit



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