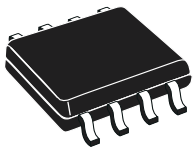
STS2DPF80

DUAL P-CHANNEL 80V - 0.21 Ω - 2.3A SO-8
STripFET™ POWER MOSFET

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STS2DPF80	80 V	<0.25 Ω	2.3 A

- TYPICAL $R_{DS}(on)$ = 0.21 Ω
- STANDARD OUTLINE FOR EASY AUTOMATED SURFACE MOUNT ASSEMBLY



SO-8

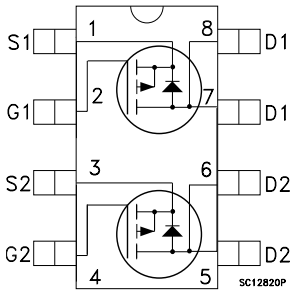
DESCRIPTION

This application specific Power MOSFET is the second generation of STMicroelectronis unique "Single Feature Size™" strip-based process. The resulting transistor shows extremely high packing density for low on-resistance, rugged avalanche characteristics and less critical alignment steps therefore a remarkable manufacturing reproducibility.

APPLICATIONS

- DC/DC CONVERTERS
- BATTERY MANAGEMENT IN NOMADIC EQUIPMENT
- POWER MANAGEMENT IN CELLULAR PHONES AND DISPLAY NEW GENERATION

INTERNAL SCHEMATIC DIAGRAM



Ordering Information

SALES TYPE	MARKING	PACKAGE	PACKAGING
STS8DPF80	S8DPF80	SO-8	TAPE & REEL

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage (V_{GS} = 0)	80	V
V_{DGR}	Drain-gate Voltage (R_{GS} = 20 kΩ)	80	V
V_{GS}	Gate- source Voltage	± 20	V
I_D	Drain Current (continuous) at T_C = 25°C Single Operation Drain Current (continuous) at T_C = 100°C Single Operation	2.0 1.3	A A
I_{DM}(•)	Drain Current (pulsed)	8	A
P_{tot}	Total Dissipation at T_C = 25°C	2.5	W
T_{stg}	Storage Temperature	-55 to 150	°C
T_j	Max. Operating Junction Temperature	150	°C

(•) Pulse width limited by safe operating area.

Note: For the P-CHANNEL MOSFET actual polarity of voltages and current has to be reversed

TAB.1 THERMAL DATA

$Rthj\text{-}_{PCB}$(*)	Thermal Resistance Junction-PCB	62.5	°C/W

(*) When Mounted on 1 inch² FR-4 board, 2 oz of Cu and t [10 sec.

ELECTRICAL CHARACTERISTICS (T_{CASE} = 25 °C UNLESS OTHERWISE SPECIFIED)

TAB.2 OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	I_D = 250 µA, V_{GS} = 0	80			V
I_{DSS}	Zero Gate Voltage Drain Current (V_{GS} = 0)	V_{DS} = Max Rating V_{DS} = Max Rating T_C = 125°C			1 10	µA µA
I_{GSS}	Gate-body Leakage Current (V_{DS} = 0)	V_{GS} = ± 20 V			±100	nA

TAB.3 ON (*)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS} I_D = 250 µA	2		4	V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 10 V I_D = 1 A		0.21	0.25	Ω

TAB.4 DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (*)	Forward Transconductance	V_{DS}= 10V I_D = 1 A		4		S
C_{iss} C_{oss} C_{rss}	Input Capacitance Output Capacitance Reverse Transfer Capacitance	V_{DS} = 25V, f = 1 MHz, V_{GS} = 0		739 89.5 31		pF pF pF

ELECTRICAL CHARACTERISTICS (continued)

TAB.5 SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$ t_r	Turn-on Delay Time Rise Time	V_{DD} = 40 V I_D = 1 A R_G = 4.7 Ω V_{GS} = 10 V (Resistive Load, Figure 1)		13.5 18		ns ns
Q_g Q_{gs} Q_{gd}	Total Gate Charge Gate-Source Charge Gate-Drain Charge	V_{DD}= 64V I_D= 2A V_{GS}=10V (See test circuit, Figure 2)		20 2.5 4.9		nC nC nC

TAB.6 SWITCHING OFF

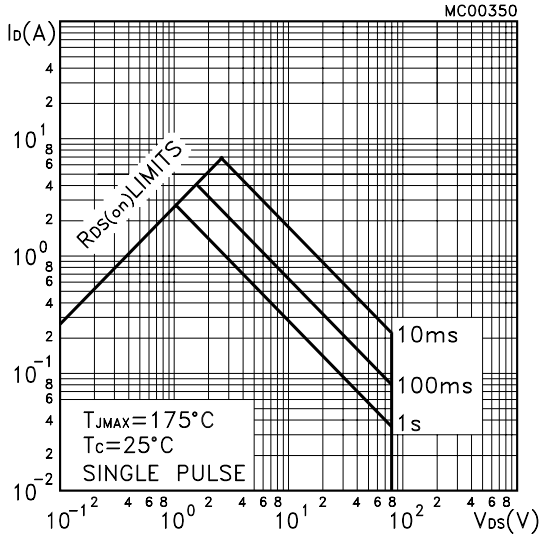
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$ t_f	Turn-off Delay Time Fall Time	V_{DD} = 40 V I_D = 1 A R_G = 4.7Ω, V_{GS} = 10 V (Resistive Load, Figure 1)		32 13		ns ns

TAB.7 SOURCE DRAIN DIODE

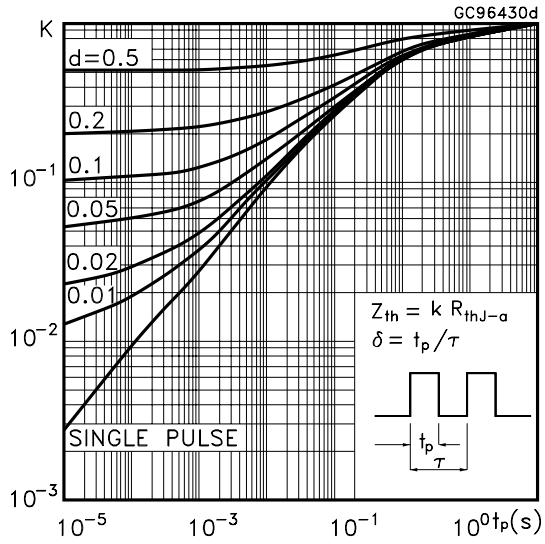
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} I_{SDM} (•)	Source-drain Current Source-drain Current (pulsed)				2.3 9.2	A A
V_{SD} (*)	Forward On Voltage	I_{SD} = 1 A V_{GS} = 0			1.2	V
t_{rr} Q_{rr} I_{RRM}	Reverse Recovery Time Reverse Recovery Charge Reverse Recovery Current	I_{SD} = 2 A di/dt = 100A/µs V_{DD} = 40 V T_j = 150°C (See test circuit, Figure 3)		47 87 3.7		ns nC A

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

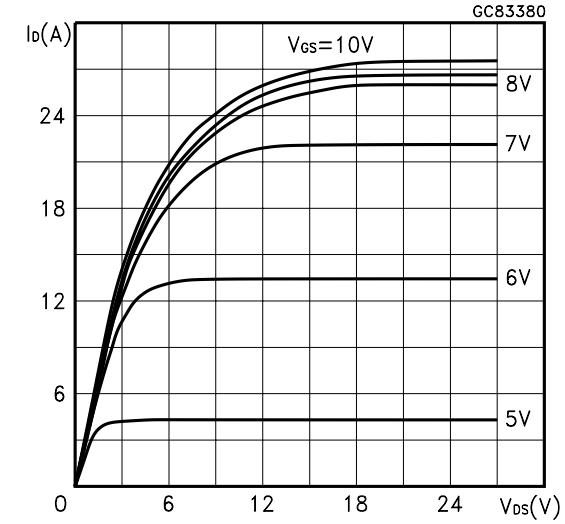
Safe Operating Area



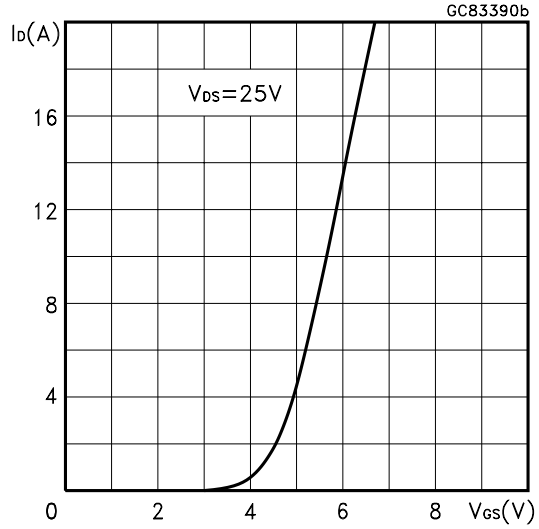
Thermal Impedance



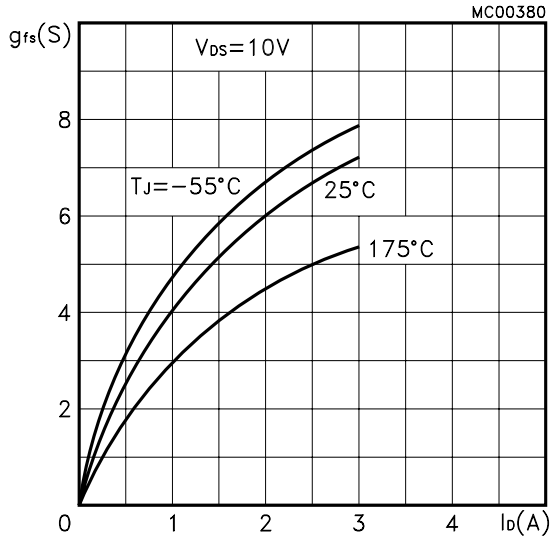
Output Characteristics



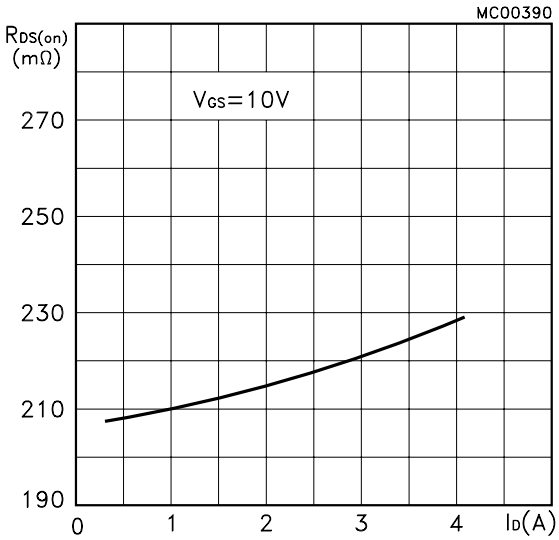
Transfer Characteristics



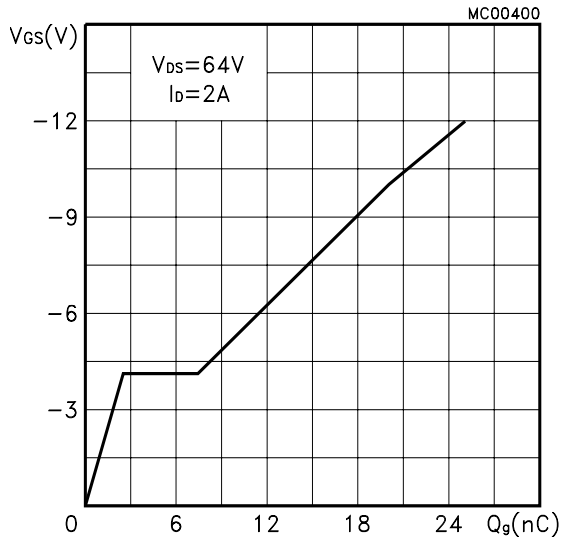
Transconductance



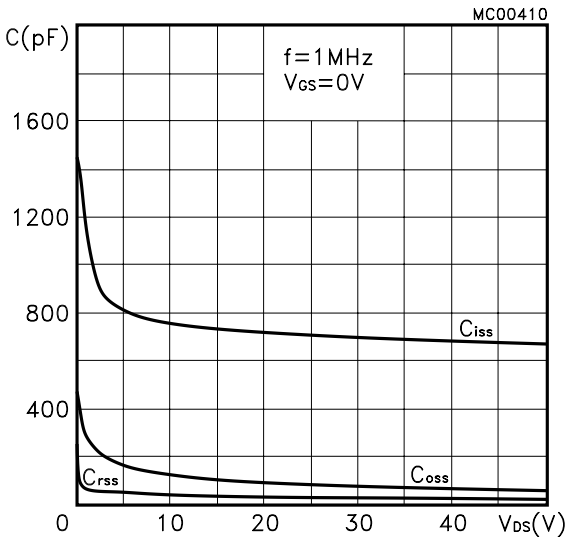
Static Drain-source On Resistance



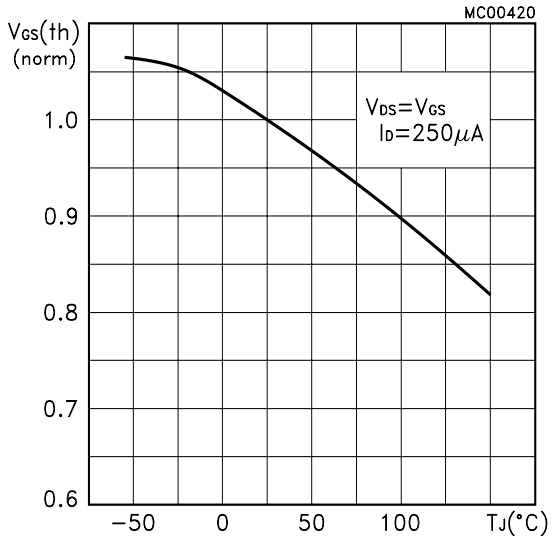
Gate Charge vs Gate-source Voltage



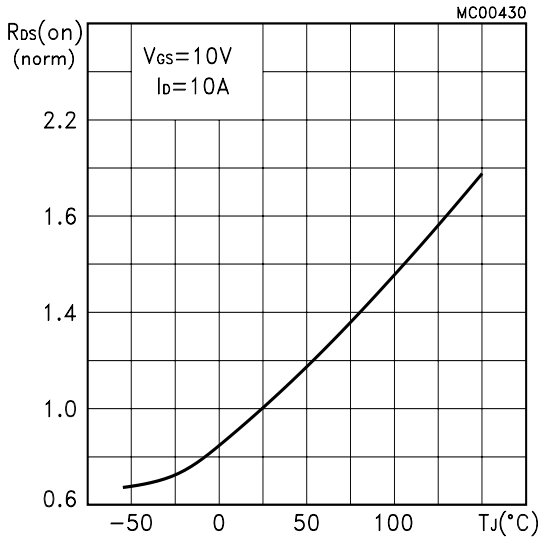
Capacitance Variations



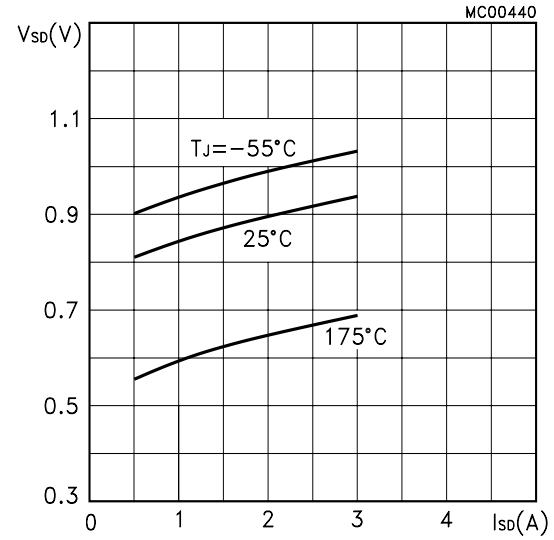
Normalized Gate Threshold Voltage vs Temperature



Normalized on Resistance vs Temperature



Source-drain Diode Forward Characteristics



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Normalized Breakdown Voltage Temperature.

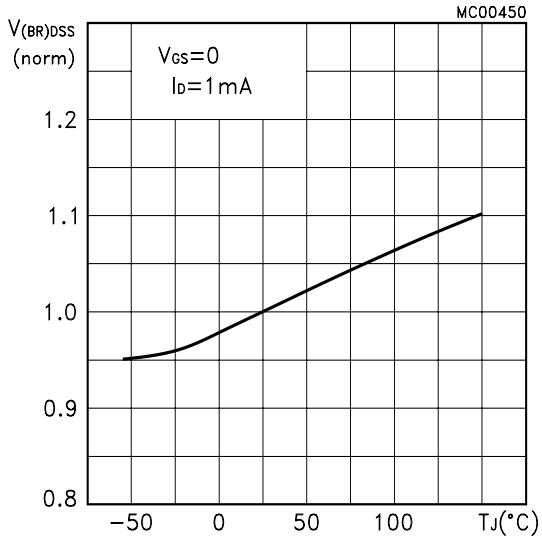

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Fig. 1: Switching Times Test Circuits For Resistive Load

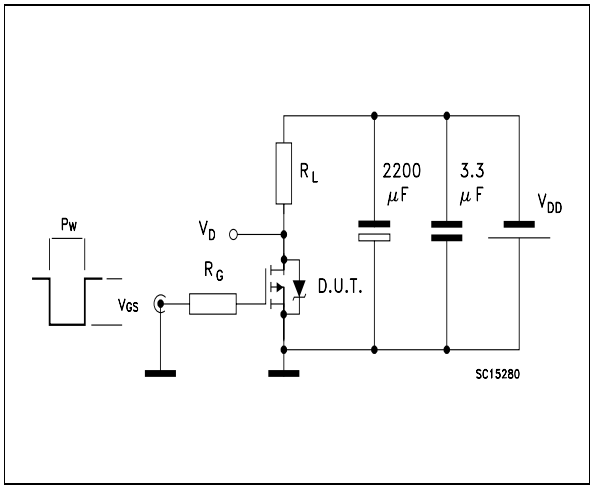


Fig. 2: Gate Charge test Circuit

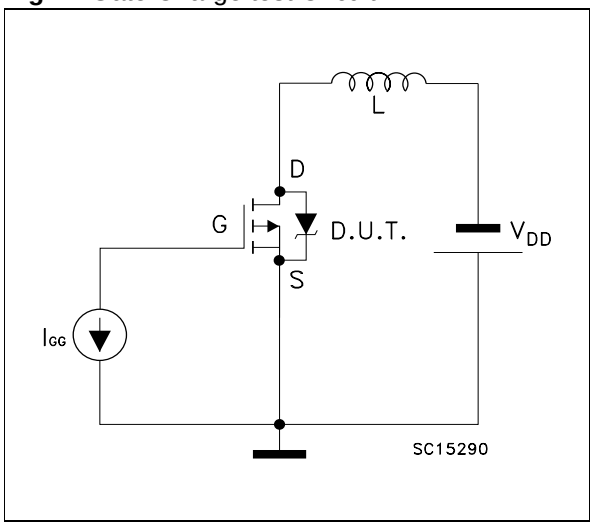
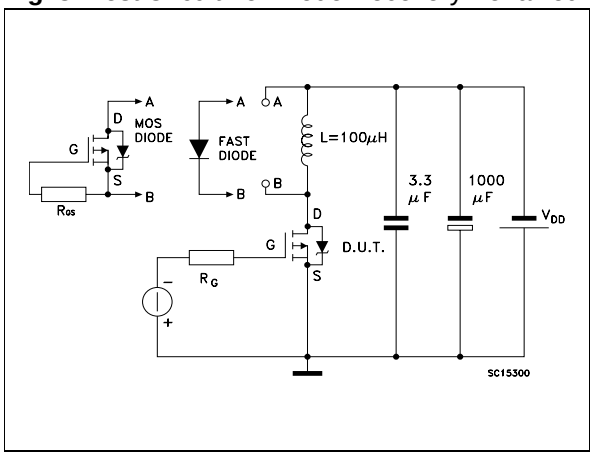
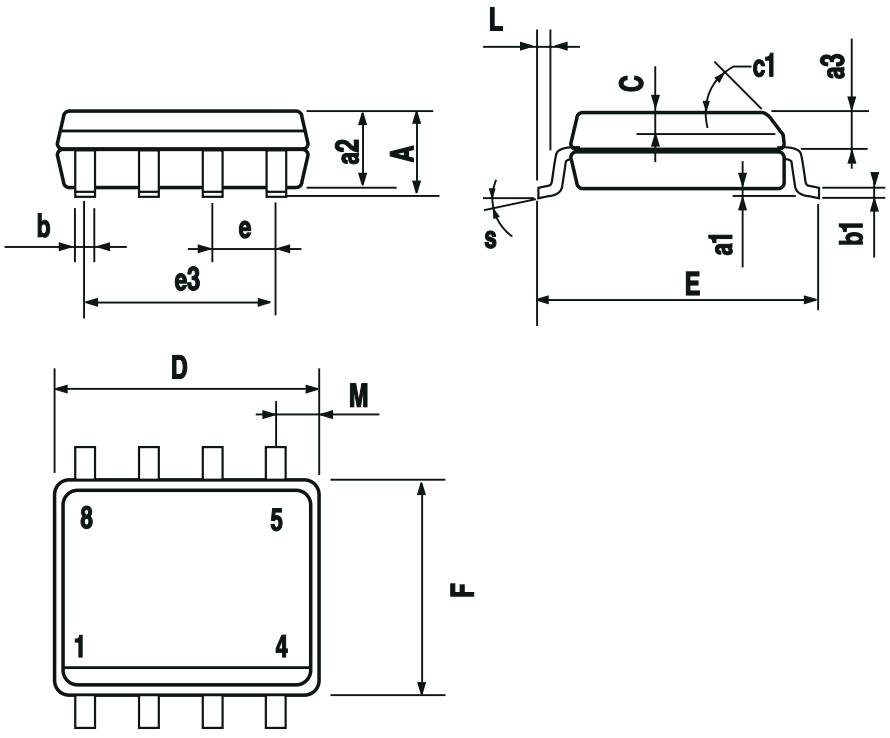


Fig. 3: Test Circuit For Diode Recovery Behaviour



SO-8 MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			1.75			0.068
a1	0.1		0.25	0.003		0.009
a2			1.65			0.064
a3	0.65		0.85	0.025		0.033
b	0.35		0.48	0.013		0.018
b1	0.19		0.25	0.007		0.010
C	0.25		0.5	0.010		0.019
c1	45 (typ.)					
D	4.8		5.0	0.188		0.196
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		3.81			0.150	
F	3.8		4.0	0.14		0.157
L	0.4		1.27	0.015		0.050
M			0.6			0.023
S	8 (max.)					



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Revision History

Date	Revision	Description of Changes
Wednesday 16 June 2004	0.1	FIRST ISSUE