

General Description

FSMOS[®]

low

$R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics. The low V_{th} series is specially designed to use in synchronous rectification power systems with low driving voltage.

Features

- Low $R_{DS(ON)}$ & FOM
- Extremely low switching loss
- Excellent reliability and uniformity
- Fast switching and soft recovery



Applications

- PD charger
- Motor driver
- Switching voltage regulator
- DC-DC convertor
- Switched mode power supply

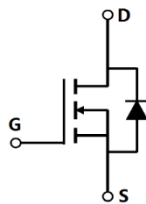
Key Performance Parameters

Parameter	Value	Unit
$V_{DS, min} @ T_{j(max)}$	60	V
$I_{D, pulse}$	210	A
$R_{DS(ON) max} @ V_{GS}=10V$	6	
Q_g	30	nC

Marking Information

Product Name	Package	Marking
SFS06R06FF	TO220F	SFS06R06F

Package & Pin information



Absolute Maximum Ratings at $T_j=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain source voltage	V_{DS}	60	V
Gate source voltage	V_{GS}	± 20	V
Continuous drain current ¹⁾ , $T_C=25^{\circ}\text{C}$	I_D	70	A
Pulsed drain current ²⁾ , $T_C=25^{\circ}\text{C}$	$I_{D, pulse}$	210	A
Continuous diode forward current ¹⁾ , $T_C=25^{\circ}\text{C}$	I_S	70	A
Diode pulsed current ²⁾ , $T_C=25^{\circ}\text{C}$	$I_{S, Pulse}$	210	A
Power dissipation ³⁾ , $T_C=25^{\circ}\text{C}$	P_D	36	W
Single pulsed avalanche energy ⁵⁾	E_{AS}	66	mJ
Operation and storage temperature	T_{stg} T_j	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	R	3.47	$^{\circ}\text{C/W}$
Thermal resistance, junction-ambient ⁴⁾	R	62.5	$^{\circ}\text{C/W}$

Electrical Characteristics at $T_j=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	60			V	$V_{GS}=0\text{ V}$, $I_D=250\text{ A}$
Gate threshold voltage	$V_{GS(th)}$	1.0		2.5	V	$V_{DS}=V_{GS}$, $I_D=250\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		4.7	6		$V_{GS}=10\text{ V}$, $I_D=20\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		6.4	10		$V_{GS}=4.5\text{ V}$, $I_D=10\text{ A}$
Gate-source leakage current	I_{GSS}			100	nA	$V_{GS}=20\text{ V}$
				-100		$V_{GS}=-20\text{ V}$
Drain-source leakage current	I_{DSS}			1	A	$V_{DS}=60\text{ V}$, $V_{GS}=0\text{ V}$
Gate resistance	R_G		2.8			

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		2136		pF	$V_{GS}=0\text{ V}$, $V_{DS}=50\text{ V}$, kHz



Electrical Characteristics Diagrams

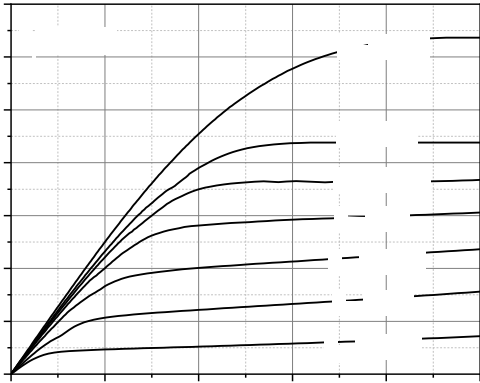


Figure 1. Typ. output characteristics

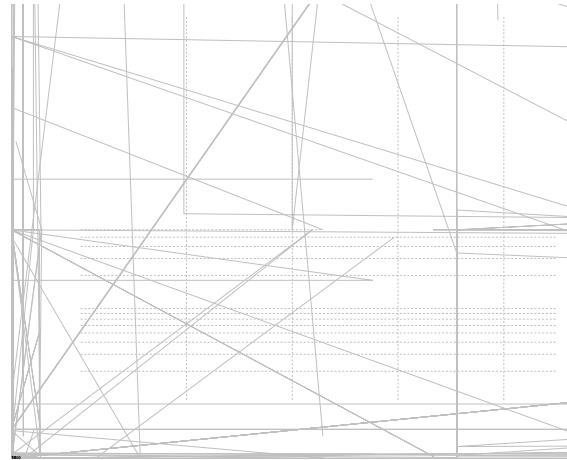


Figure 2. Typ. transfer characteristics

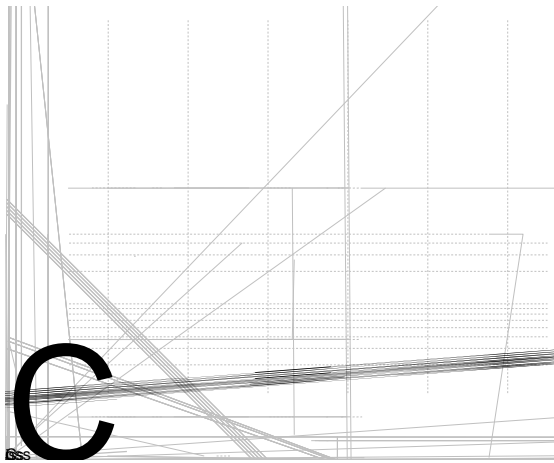


Figure 3. Typ. capacitances

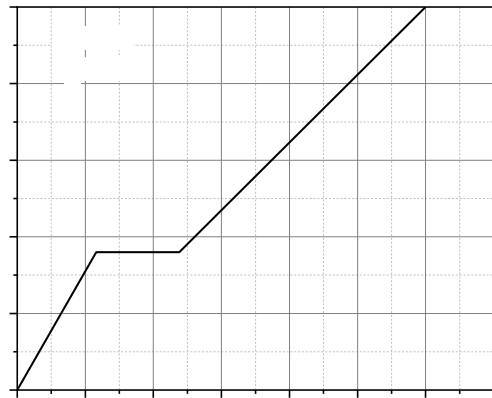


Figure 4. Typ. gate charge

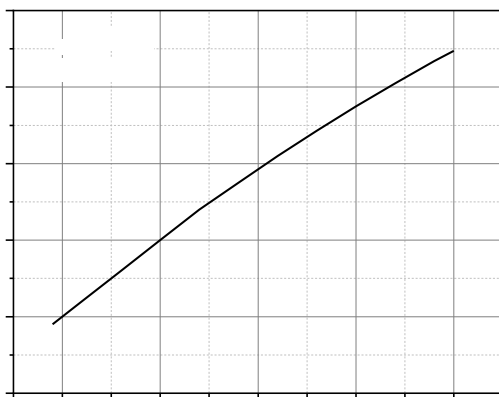


Figure 5. Drain-source breakdown voltage

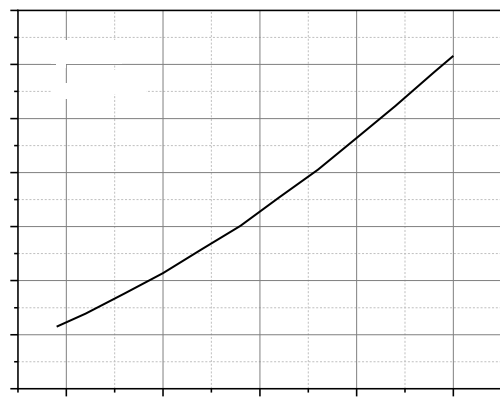
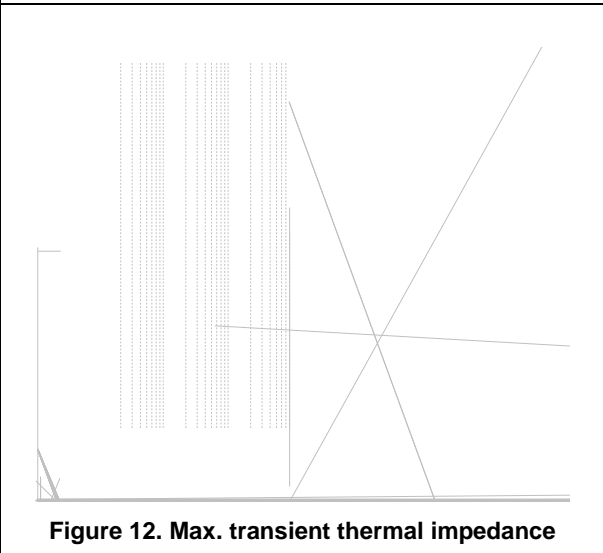
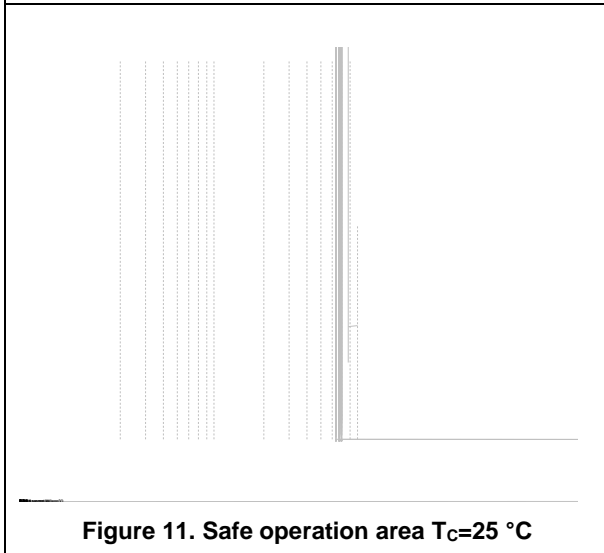
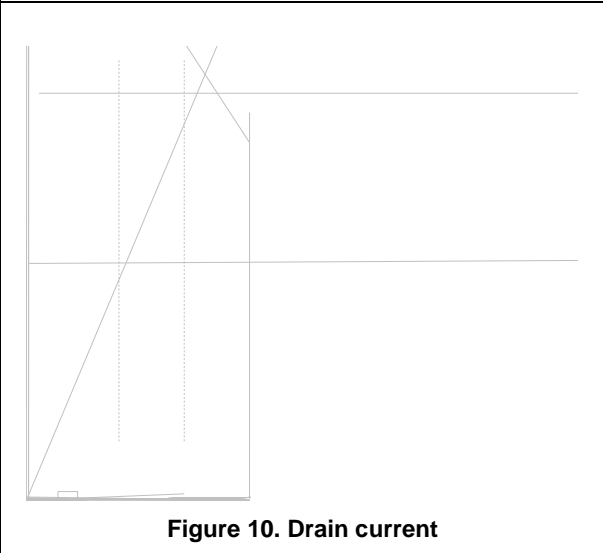
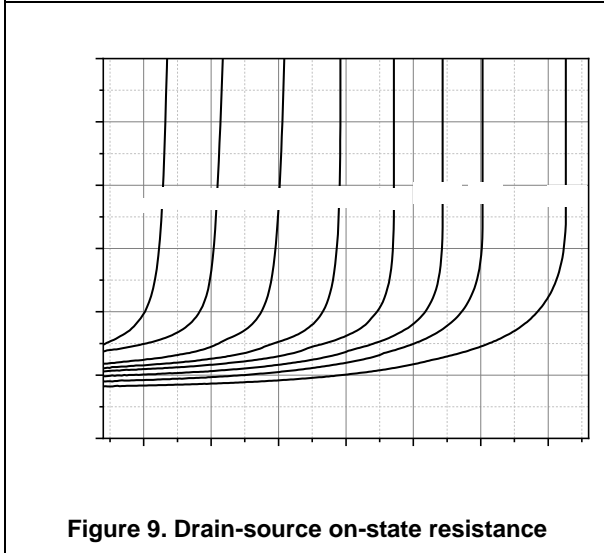
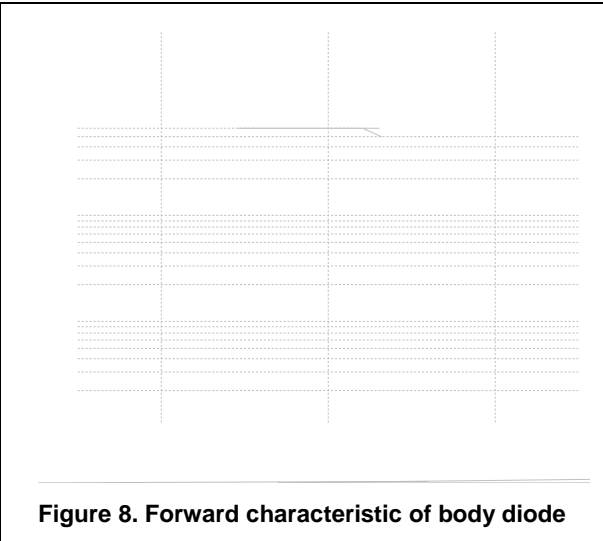
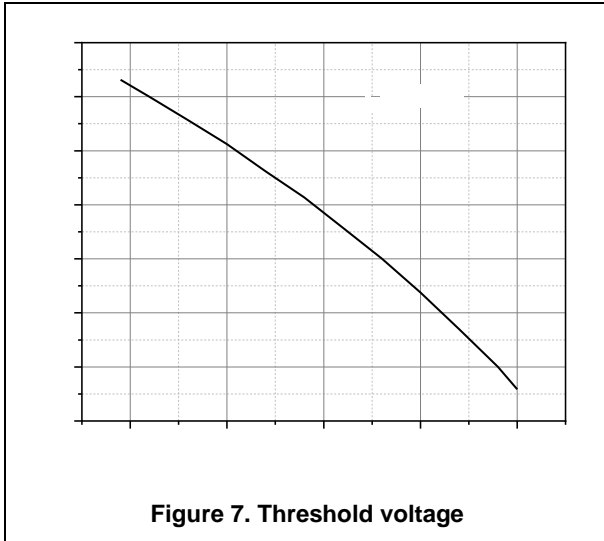


Figure 6. Drain-source on-state resistance





Test circuits and waveforms

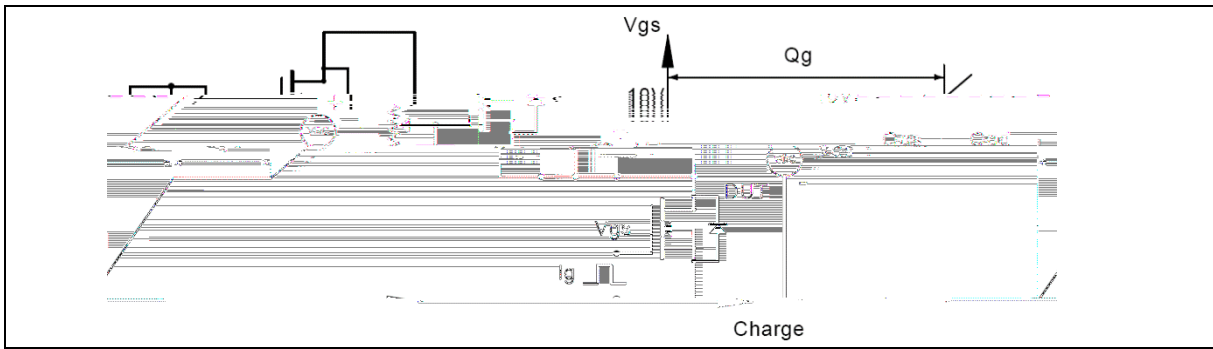


Figure 1. Gate charge test circuit & waveform

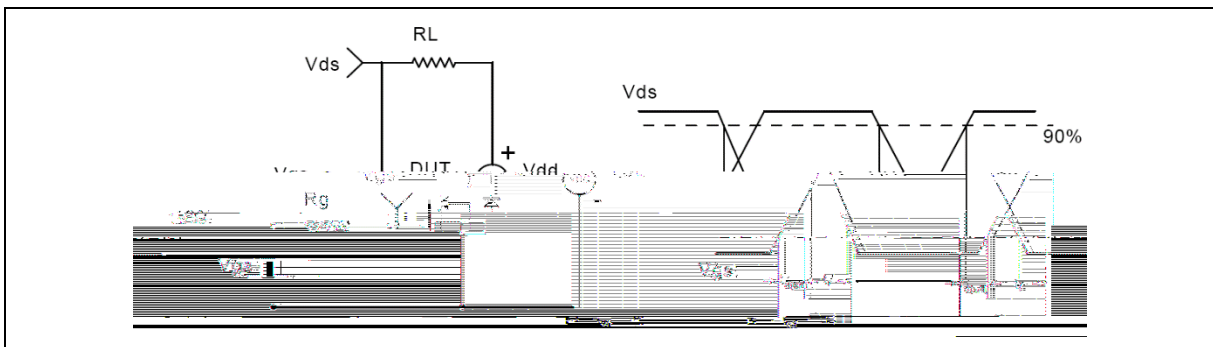


Figure 2. Switching time test circuit & waveforms

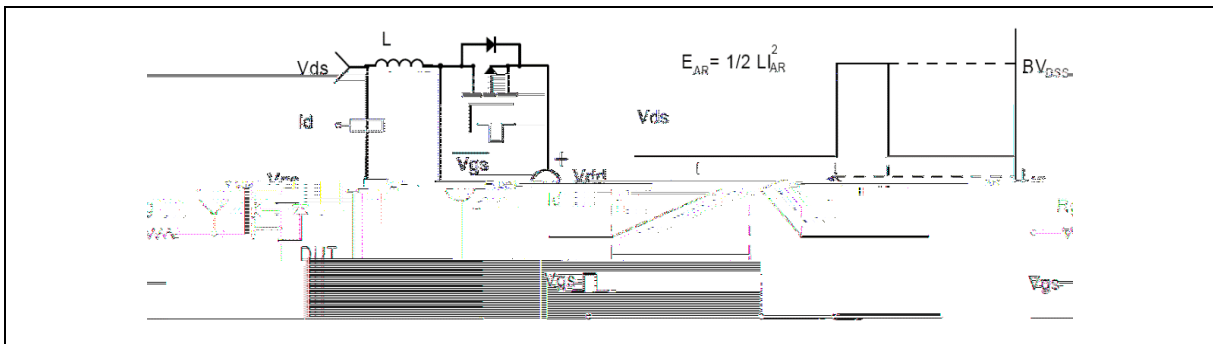


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

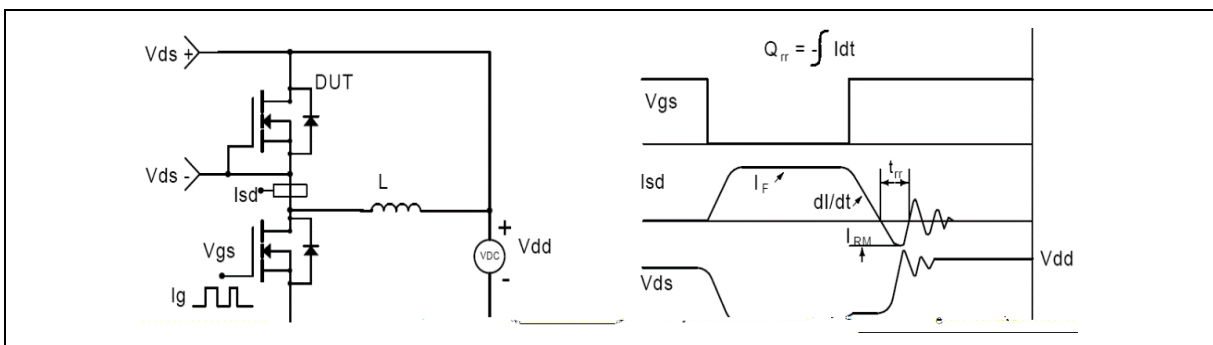


Figure 4. Diode reverse recovery test circuit & waveforms

Ordering Information

Package Type	Units/ Tube	Tubes / Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO220F-J	50	20	1000	5	5000

Product Information

Product	Package	Pb Free	RoHS	Halogen Free
SFS06R06FF	TO220F	yes	yes	yes

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