General Description

FSMOS®

$R_{DS(ON)}$, low gate charge, fast switching and excellent avalanche characteristics. The low V_{th} series is specially optimized for synchronous rectification 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	4.5	
Q_g	30	nC

Marking Information

Product Name	Package

Absolute Maximum Ratings at T_j=25°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 °C	I_D	70	A
Pulsed drain current[2], T_C=25 °C	$I_{D,\ pulse}$	210	A
Continuous diode forward current[1], T_C=25 °C	I_S	70	A
Diode pulsed current[2], T_C=25 °C	$I_{S,\ pulse}$	210	A
Power dissipation[3], T_C=25 °C	P_D	101	W
Single pulsed avalanche energy[5]	E_{AS}	66	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-case	R	1.24	°C/W
Thermal resistance, junction-ambient[4]	R	62	°C/W

Electrical Characteristics at T_j=25°C unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	60			V	V_{GS}=0 V, I_D=250 A
Gate threshold voltage	$V_{GS(th)}$	1.0		2.5	V	V_{DS}=V_{GS}, I_D=250 A
Drain-source on-state resistance	$R_{DS(ON)}$		3.5	4.5		V_{GS}=10 V, I_D=20 A
Drain-source on-state resistance	$R_{DS(ON)}$		4.5	7		V_{GS}=4.5 V, I_D=10 A
Gate-source leakage current	I_{GSS}			100	nA	V_{GS}=20 V
				-100		V_{GS}=-20 V
Drain-source leakage current	I_{DSS}			1	A	V_{DS}=60 V, V_{GS}=0 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 V, V_{DS}=50 V, Hz
Output capacitance	C_{oss}		332		pF	
Reverse transfer capacitance	C_{rss}		10.6		pF	
Turn-on delay time	$t_{d(on)}$		22.9		ns	V_{GS}=10 V, V_{DS}=50 V, R_G I_D=25 A
Rise time	t_r		6.5		ns	
Turn-off delay time	$t_{d(off)}$		45.7		ns	
Fall time	t_f					

Electrical Characteristics Diagrams

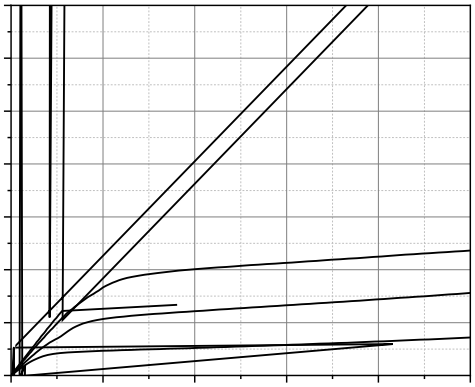


Figure 1. Typ. output characteristics

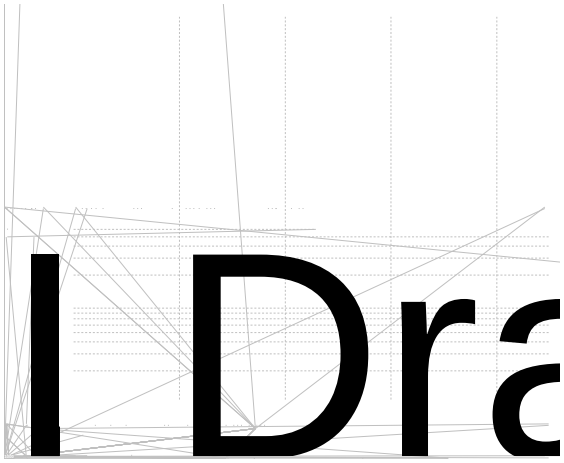


Figure 2. Typ. transfer characteristics

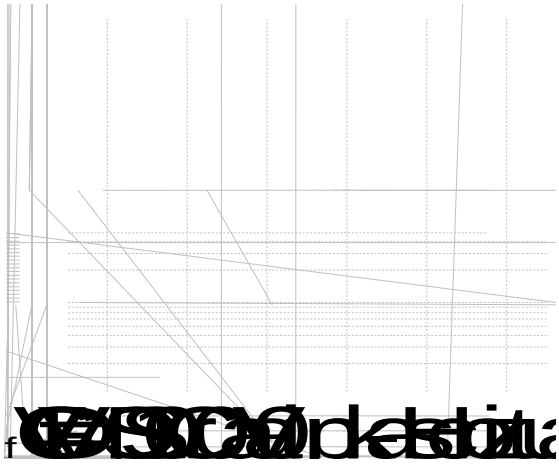


Figure 3. Typ. capacitances

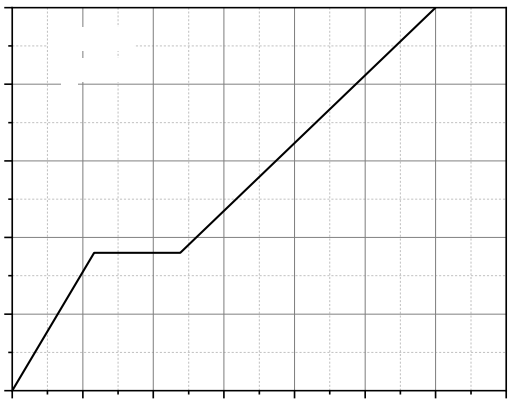


Figure 4. Typ. gate charge

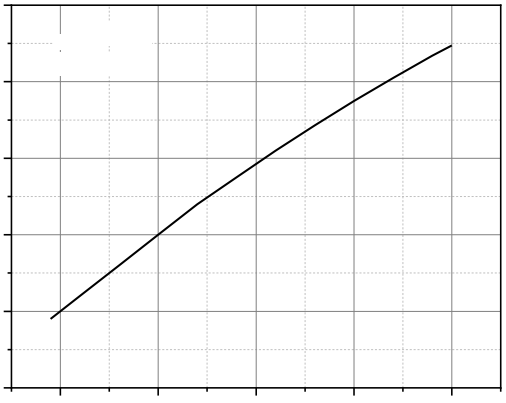


Figure 5. Drain-source breakdown voltage

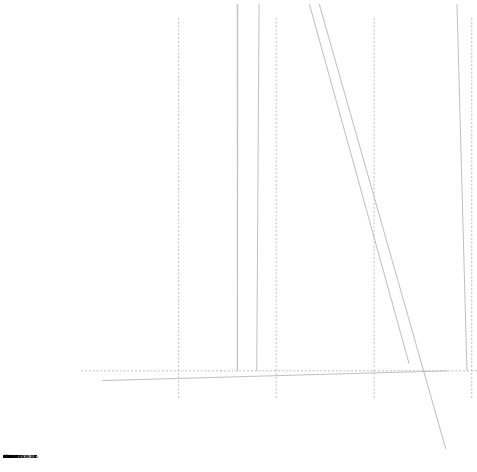


Figure 6. Drain-source on-state resistance

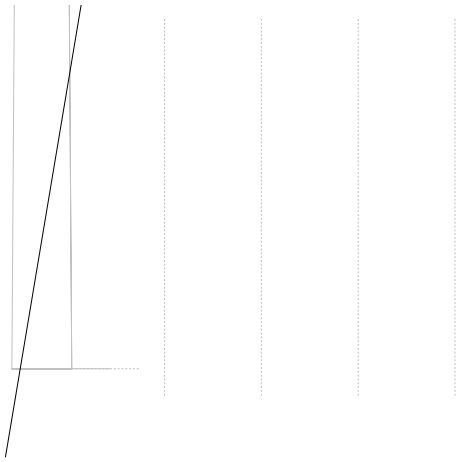


Figure 7. Threshold voltage

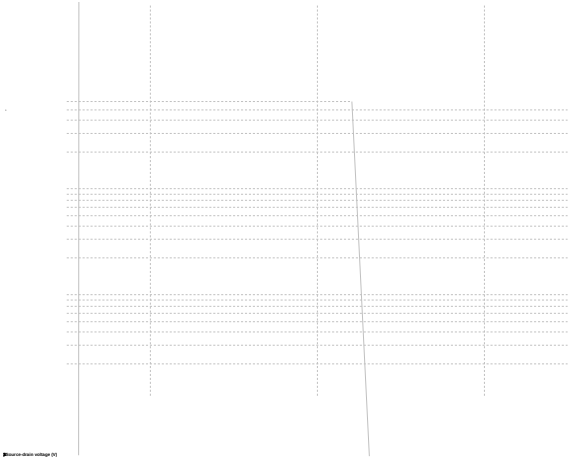


Figure 8. Forward characteristic of body diode

Figure 9. Drain-source on-state resistance

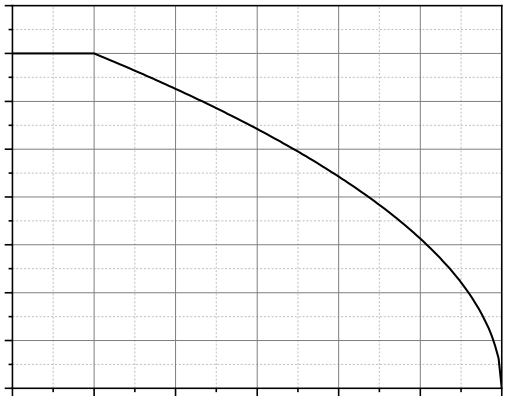


Figure 10. Drain current

Figure 11. Safe operation area T_C=25

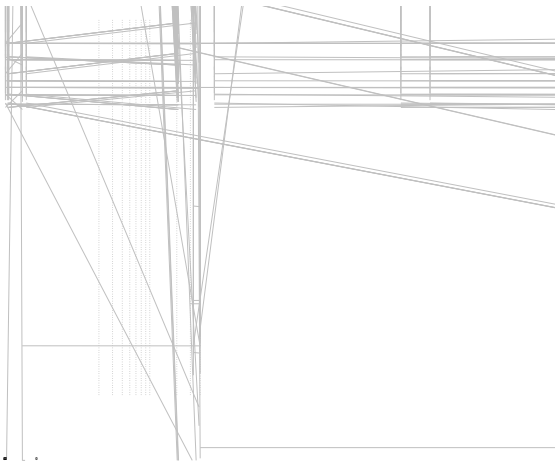


Figure 12. Max. transient thermal impedance

Test circuits and waveforms

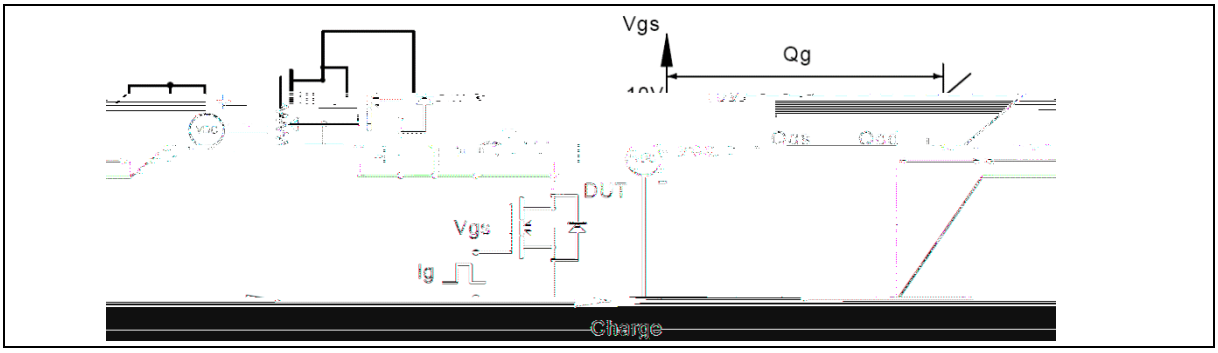


Figure 1. Gate charge test circuit & waveform

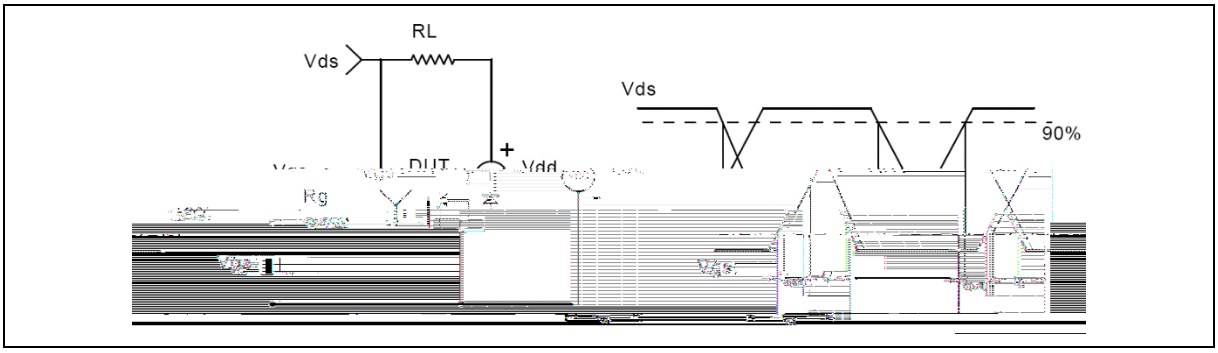


Figure 2. Switching time test circuit & waveforms

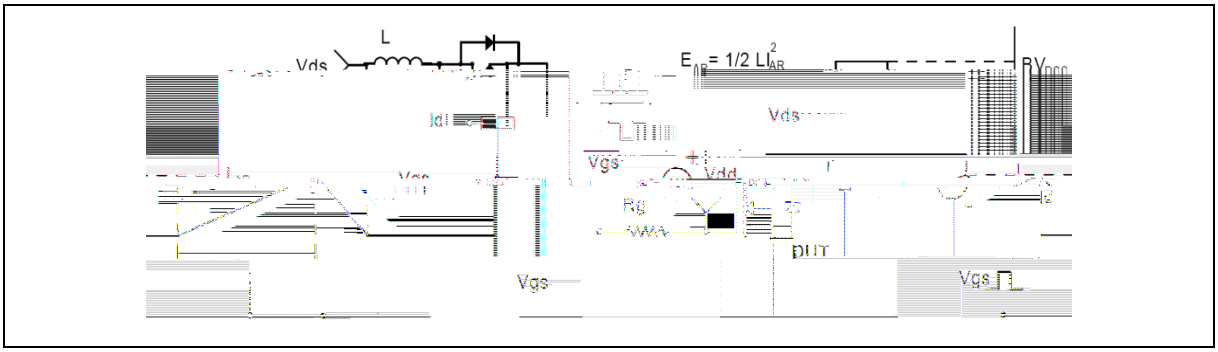


Figure 3. Unclamped inductive switching (UIS) test circuit & waveforms

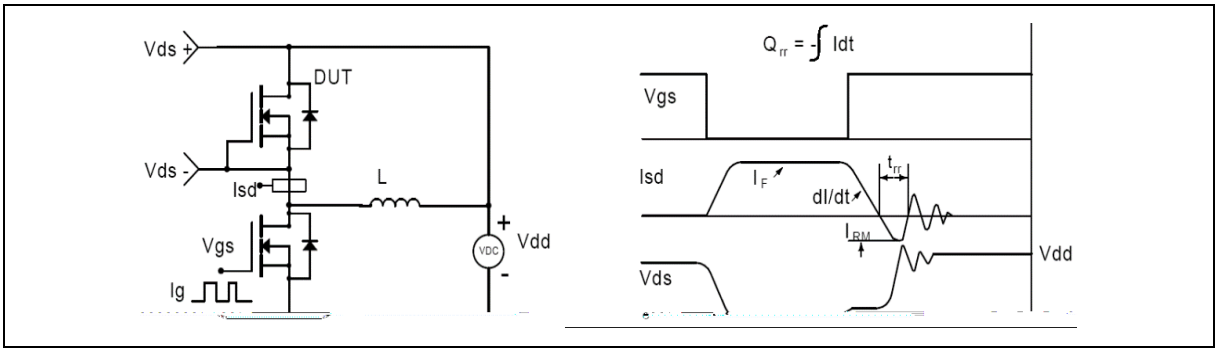
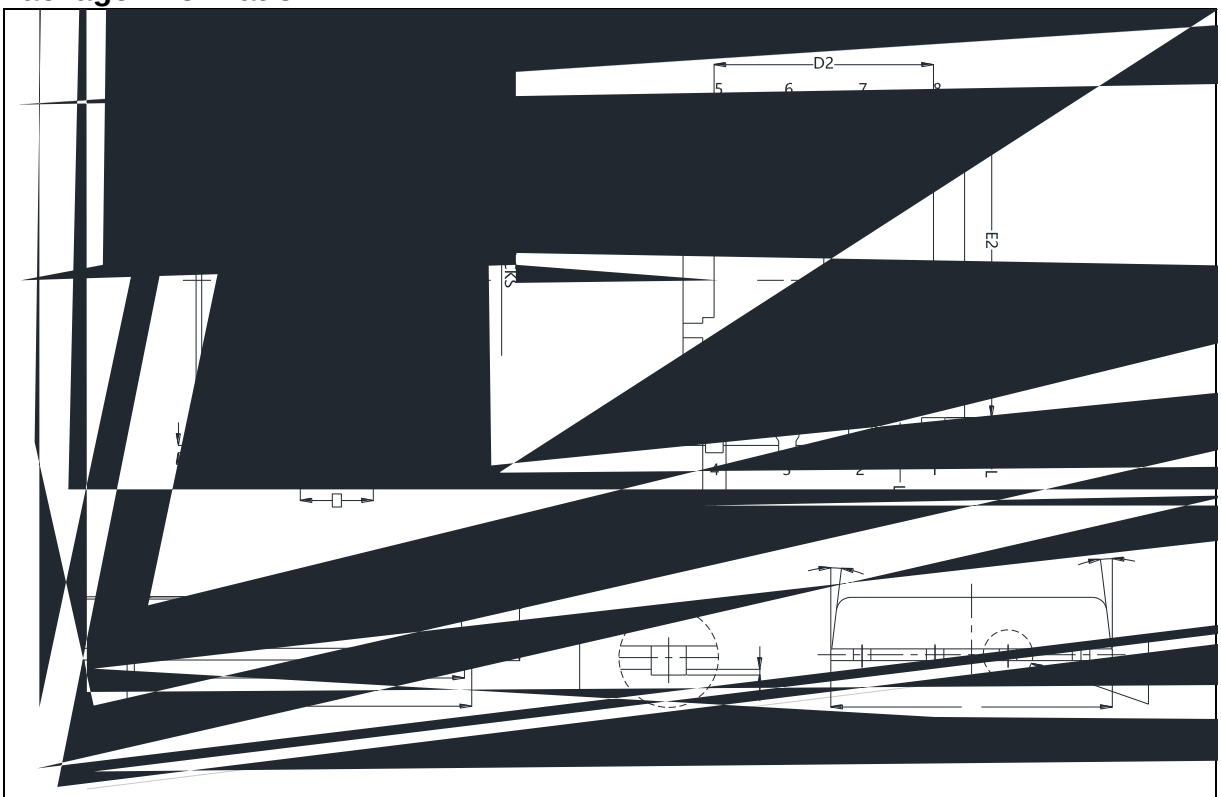


Figure 4. Diode reverse recovery test circuit & waveforms

Package Information



Symbol	mm		
	Min	Nom	Max
A	0.90	1.00	1.10
A1	0.00	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
e	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
	0°	-	12°

Version 1: PDFN5*6-M package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
PDFN5*6-M	5000	2	10000	5	50000

Product Information

Product	Package	Pb Free	RoHS