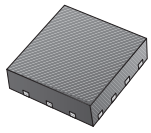
STL34NF06

N-CHANNEL 60V - 0.024Ω - 34A PowerFLAT™ LOW GATE CHARGE STripFET™II MOSFET

PRELIMINARY DATA

TYPE	V_{DSS}	$R_{DS(on)}$	I_D
STL34NF06	60 V	< 0.028Ω	34 A

- TYPICAL $R_{DS}(on)$ = 0.024Ω
- IMPROVED DIE-TO-FOOTPRINT RATIO
- VERY LOW PROFILE PACKAGE

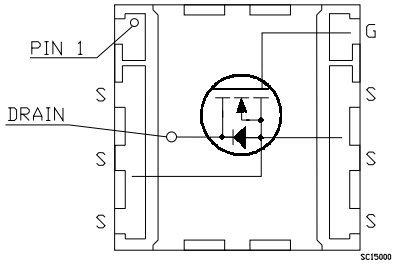


PowerFLAT™(5x5)
(Chip Scale Package)

DESCRIPTION

This Power MOSFET is the second generation of STMicroelectronics unique "STripFET™" technology. The resulting transistor shows extremely low on-resistance and minimal gate charge. The new PowerFLAT™ package allow a significant reduction in board space without compramising performance.

INTERNAL SCHEMATIC DIAGRAM



APPLICATIONS

- DC-DC CONVERTERS
- BATTERY MANAGEMENT IN NOMADIC EQUIPMENT

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{DS}	Drain-source Voltage (V_{GS} = 0)	60	V
V_{DGR}	Drain-gate Voltage (R_{GS} = 20 kΩ)	60	V
V_{GS}	Gate- source Voltage	± 20	V
I_D	Drain Current (continuous) at T_C = 25°C (*) Drain Current (continuous) at T_C = 100°C	34 20	A A
I_{DM} (•)	Drain Current (pulsed)	136	A
P_{TOT}	Total Dissipation at T_C = 25°C	70	W
	Derating Factor	0.56	W/°C
E_{AS} (1)	Single Pulse Avalanche Energy	250	mJ
T_{stg}	Storage Temperature	–55 to 150	°C
T_j	Max. Operating Junction Temperature		

(•)Pulse width limited by safe operating area

(1) Starting T_j = 25°C, I_D = 17A, V_{DD} = 42V

(*) Current Limited by Wire Bonding is 20A

THERMAL DATA

Rthj-case	Thermal Resistance Junction-case Max	1.8	°C/W
Rthj-pcb (#)	Thermal Resistance Junction-ambient Max	31.2	°C/W

(*) When mounted on 1inch² FR4 Board, 2oz of Cu, t ≤ 10 sec.

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

OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{(BR)DSS}$	Drain-source Breakdown Voltage	I_D = 250 µA, V_{GS} = 0	60			V
I_{DSS}	Zero Gate Voltage Drain Current (V_{GS} = 0)	V_{DS} = Max Rating			1	µA
		V_{DS} = Max Rating, T_C = 125 °C			10	µA
I_{GSS}	Gate-body Leakage Current (V_{DS} = 0)	V_{GS} = ± 20V			±100	nA

ON (1)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250µA	2			V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS} = 10V, I_D = 17A		0.024	0.028	Ω

DYNAMIC

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
g_{fs} (1)	Forward Transconductance	V_{DS} = 30 V , I_D = 17 A		TBD		S
C_{iss}	Input Capacitance	V_{DS} = 25V, f = 1 MHz, V_{GS} = 0		920		pF
C_{oss}	Output Capacitance			225		pF
C_{rss}	Reverse Transfer Capacitance			80		pF

1. Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %.

ELECTRICAL CHARACTERISTICS (CONTINUED)

SWITCHING ON

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(on)}$	Turn-on Delay Time	V_{DD} = 30V, I_D = 17 A R_G = 4.7Ω V_{GS} = 10V (see test circuit, Figure 3)		11		ns
t_r	Rise Time			50		ns
Q_g	Total Gate Charge	V_{DD} = 48V, I_D = 34 A, V_{GS} = 10V		32	43	nC
Q_{gs}	Gate-Source Charge			6.5		nC
Q_{gd}	Gate-Drain Charge			14.4		nC

SWITCHING OFF

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
$t_{d(off)}$	Turn-Off-Delay Time	V_{DD} = 30V, I_D = 17A, R_G = 4.7Ω, V_{GS} = 10V (see test circuit, Figure 3)		27		ns
t_f	Fall Time			11		ns

SOURCE DRAIN DIODE

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
I_{SD} (3)	Source-drain Current				34	A
I_{SDM} (2)	Source-drain Current (pulsed)				136	A
V_{SD} (1)	Forward On Voltage	I_{SD} = 34 A, V_{GS} = 0			1.2	V
t_{rr}	Reverse Recovery Time	I_{SD} = 34 A, di/dt = 100A/µs, V_{DD} = 10V, T_j = 150°C (see test circuit, Figure 5)		63		ns
Q_{rr}	Reverse Recovery Charge			151		nC
I_{RRM}	Reverse Recovery Current			4.8		A

Note: 1. Pulsed: Pulse duration = 300 µs, duty cycle 1.5 %.
2. Pulse width limited by safe operating area.
3. Current Limited by Wire Bonding is 20A

Fig. 1: Unclamped Inductive Load Test Circuit

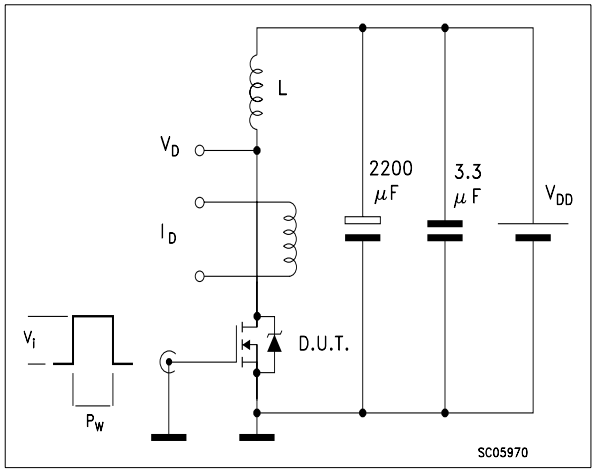


Fig. 2: Unclamped Inductive Waveform

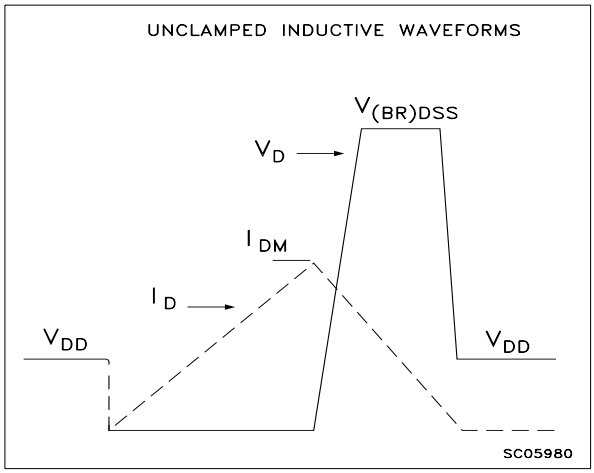


Fig. 3: Switching Times Test Circuit For Resistive Load

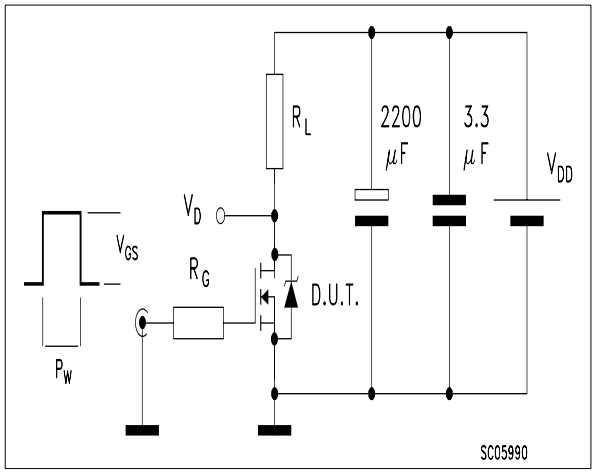


Fig. 4: Gate Charge test Circuit

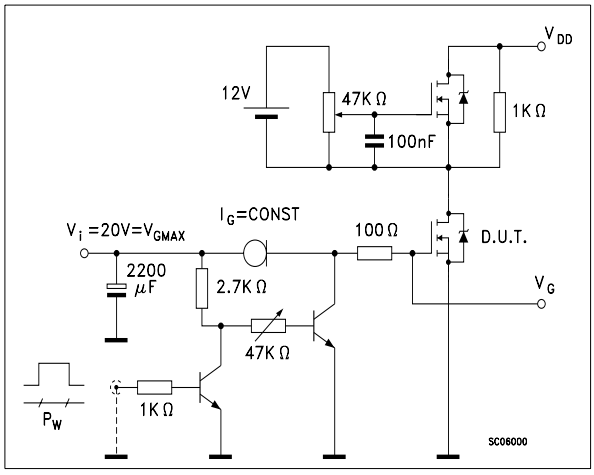
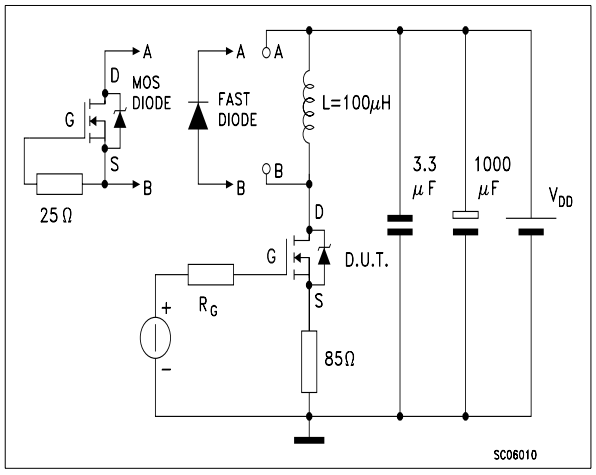


Fig. 5: Test Circuit For Inductive Load Switching And Diode Recovery Times



PowerFLAT™(5x5) MECHANICAL DATA

DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A		0.90	1.00		0.035	0.039
A1		0.02	0.05		0.001	0.002
b	0.43	0.51	0.58	0.017	0.020	0.023
c	0.33	0.41	0.48	0.013	0.016	0.019
D		5.00			0.197	
E		5.00			0.197	
E2	3.10	3.18	3.25	0.122	0.125	0.128
e		1.27			0.050