3.7mΩ, 40V, N-Channel Power MOSFET SRT04N037LS

General Description

The Sanrise SRT04N037LS is a low voltage power MOSFET, fabricated using advanced split gate trench technology. The resulting device has extremely low on resistance, low gate charge and fast switching time, making it especially suitable for applications which require superior power density.

The SRT04N037LS break down voltage is 40V and it has a high rugged avalanche characteristics.

The SRT04N037LS is available in PDFN5*6 and PDFN3.3*3.3 packages.

Symbol

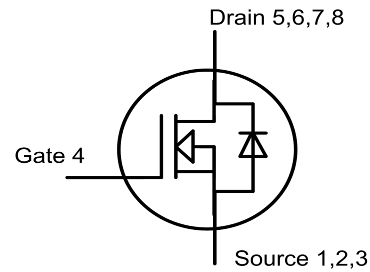


Figure 1 Symbol of SRT04N037LS

Features

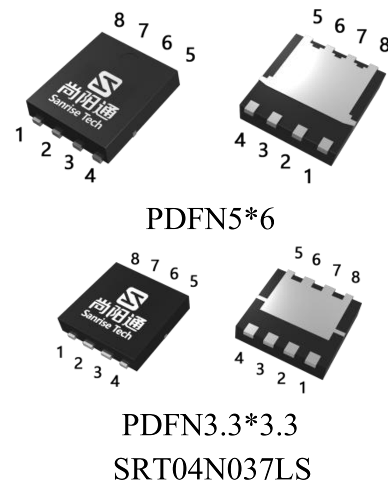
- Ultra Low

$R_{DS(ON)_TYP}$ = 3.25mΩ,PDFN5*6@V_{GS} = 10V.

$R_{DS(ON)_TYP}$ = 3.8mΩ,PDFN3.3*3.3@V_{GS} = 10V.

- Ultra Low Gate Charge, Qg=26nC typ.
- Fast switching capability
- Robust design with better EAS performance
- Non-automotive Qualified

Package Type



PDFN5*6

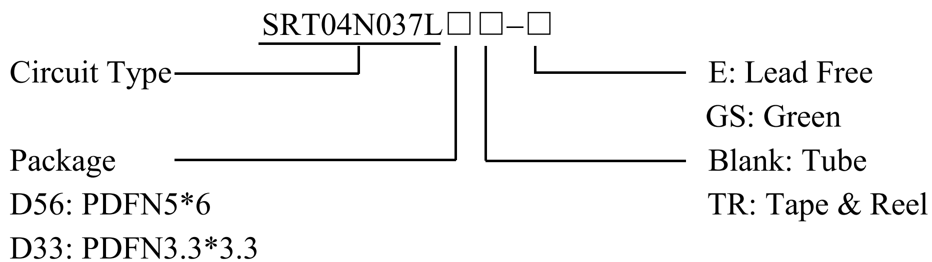
PDFN3.3*3.3

SRT04N037LS

Application

- Motor Driver
- E-Tools
- BMS
- Synchronous Rectifier

Ordering Information



Package	Part Number	Marking ID	Packing Type
	Green	Green	
PDFN5*6	SRT04N037LD56TR-GS	SRT04N037LD56GS	Tape & Reel
PDFN3.3*3.3	SRT04N037LD33TR-GS	04N037LD33GS	Tape & Reel

Absolute Maximum Ratings

Parameter		Symbol	Rating		Unit
Drain-Source Voltage		V_{DSS}	40		V
Gate-Source Voltage		V_{GSS}	±20		V
Continuous Drain Current	T_C=25ºC	I_D	PDFN5*6	80	A
			PDFN3.3*3.3	60	
	T_C=125ºC		PDFN5*6	40	
			PDFN3.3*3.3	38	
Pulsed Drain Current (Note 2)	T_C=25ºC	I_{DM}	PDFN5*6	240	A
			PDFN3.3*3.3	180	
Power Dissipation (T_C = 25°C)		P_D	54		W
Avalanche Destructive Energy, Single Pulse (Note 4)		E_{AS_Limit}	225		mJ
Avalanche Energy, Single Pulse (Note 3)		E_{AS}	36		mJ
Avalanche Energy, Repetitive (Note 2)		E_{AR}	0.1		mJ
Avalanche Current, Repetitive (Note 2)		I_{AR}	20		A
Continuous Diode Forward Current		I_S	80		A
Diode Pulse Current		$I_{S.PULSE}$	240		A
Operating Junction Temperature		T_J	150		ºC
Storage Temperature		T_{STG}	-55 to 150		ºC
Lead Temperature (Soldering, 10 sec)		T_{LEAD}	260		ºC

Note:

1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. I_{AS}= 12A, V_{DD}= 20V, R_G= 25Ω, Starting T_J= 25°C
4. I_{AS_Limit}= 30A, V_{DD} = 20V, R_G = 25Ω, Starting T_J = 25°C

Thermal Resistance

Parameter		Symbol	Min	Typ	Max	Unit
Thermal Resistance，Junction-to-Case	PDFN5*6	R_{thJC}			2.3	ºC/W
	PDFN3.3*3.3	R_{thJC}			2.3	
Thermal Resistance，Junction-to-Ambient	PDFN5*6	R_{thJA}			50	
	PDFN3.3*3.3	R_{thJA}			60	

Electrical Characteristics

T_J = 25℃, unless otherwise specified.

Parameter		Symbol	Test Conditions	Min	Typ	Max	Unit
Statistic Characteristics							
Drain-Source Breakdown Voltage		BV_{DSS}	V_{GS}=0V, I_D=250uA	40			V
Zero Gate Voltage Drain Current		I_{DSS}	V_{DS}=40V, V_{GS}=0V			1	uA
Gate-Body Leakage Current	Forward	I_{GSSF}	V_{GS}=20V, V_{DS}=0V			200	nA
	Reverse	I_{GSSR}	V_{GS}=-20V, V_{DS}=0V			-200	
Gate Threshold Voltage		$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=0.25mA	1.2	1.8	2.6	V
Static Drain-Source On-Resistance	PDFN56	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		3.25	3.7	mΩ
	PDFN33		V_{GS}=10V, I_D=20A		3.80	4.1	mΩ
Gate Resistance		R_G	f=1MHz, Open Drain		3.0		Ω
Dynamic Characteristics							
Input Capacitance		C_{ISS}	V_{DS}=20V, V_{GS}=0V, f=1MHz		1.8		nF
Output Capacitance		C_{OSS}			487		pF
Reverse Transfer Capacitance		C_{RSS}			31		pF
Effective output capacitance, energy related NOTE5		$C_{O(er)}$	V_{GS}=0V, V_{DS}=0…20V		760		pF
Effective output capacitance, time related NOTE6		$C_{O(tr)}$			936		
Turn-on Delay Time		$t_{d(on)}$	V_{DD}=20V, I_D=20A R_G=1.6Ω, V_{GS}=10V		13		ns
Rise Time		t_r			35		
Turn-off Delay Time		$t_{d(off)}$			40		
Fall Time		t_f			8		
Gate Charge Characteristics							
Gate to Source Charge		Q_{gs}	V_{DD}=20V, I_D=20A V_{GS}=0 to 10V		3.9		nC
Gate to Drain Charge		Q_{gd}			3.0		
Gate Charge Total		Q_g			26		
Gate Plateau Voltage		$V_{plateau}$			2.4		V
Gate Charge Total, sync FET		Q_g	V_{DD}=0.1V, V_{GS}=0 to 10V		24.6		nC
Reverse Diode Characteristics							
Drain-Source Diode Forward Voltage		V_{SD}	V_{GS}=0V, I_{SD}=20A		0.82	1.0	V
Reverse Recovery Time		t_{rr}	V_R=20V, I_F=20A dI_F/dt=100A/us		46		ns
Reverse Recovery Charge		Q_{rr}			70		nC
Peak Reverse Recovery Current		I_{rrm}			3.1		A

Note:

5. $C_{O(er)}$ is a fixed capacitance that gives the same stored energy as C_{OSS} while V_{DS} is rising from 0 to 20V
6. $C_{O(tr)}$ is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 20 V

Sanrise Technology Limited Company

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