

V_{DSS} , 75V R_{DS(ON)} , 9mΩ (max.) @ V_{GS}=10V I_D , 80A <small>Note 3</small>	PDFN 5x6-8L		

Description	Features
The SG75N07Q uses advanced Trench technology and designs to provide excellent R _{DS(ON)} with low gate charge. This device is suitable for use in PWM, load switching and general purpose applications.	<ul style="list-style-type: none"> Low On-Resistance Low Input Capacitance Low Miller Charge Low Input / Output Leakage Pb-free lead plating; RoHS compliant
	Applications <ul style="list-style-type: none"> Motor / Body Load Control Load Switch DC-DC converters and Off-line UPS

Ordering Information

Ordering Code	RoHS Status	Package	Package Code	Packing	Quantity
SG75N07Q	Halogen-Free	PDFN 5x6-8L	Q	Tape & Reel	2,500

Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V _{DS}	75	V
Gate-Source Voltage		V _{GS}	±25	V
Drain Current-Continuous <small>Note 3</small>	T _C =25°C	I _D	80	A
	T _C =70°C		64	A
Drain Current-Pulsed <small>Note 1</small>		I _{DM}	300	A
Drain Current-Continuous	T _A =25°C	I _D	18	A
	T _A =70°C		15	A
Avalanche Current, L=0.5mH		I _{AS}	28.3	A
Avalanche Energy, L=0.5mH		E _{AS}	200	mJ
Maximum Power Dissipation	T _C =25°C	P _D	104	W
	T _C =70°C		67	W
	T _A =25°C		5.7	W
	T _A =70°C		3.6	W
Operating Junction Temperature Range		T _J T _{STG}	-55 to +150	°C

Thermal Resistance Ratings

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Maximum Junction-to-Ambient <small>Note 2</small>	R _{θJA}	Steady State	-	-	62	°C/W
Maximum Junction-to-Case <small>Note 2</small>	R _{θJC}	Steady State	-	-	1.2	°C/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250μA	75	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =60V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±25V, V _{DS} =0V	-	-	±100	nA

ON CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250μA	2	3	4	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =30A	-	-	9	mΩ

DYNAMIC CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHz	-	4800	-	pF
Output Capacitance	C _{oss}		-	650	-	
Reverse Transfer Capacitance	C _{rss}		-	340	-	

SWITCHING CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	T _{d(on)}	V _{DD} =30V, I _D =30A, V _{GS} =10V, R _g =3Ω	-	25	-	ns
Rise Time	t _r		-	21	-	
Turn-Off Delay Time	T _{d(off)}		-	85	-	
Fall Time	t _f		-	42	-	
Total Gate Charge at 10V	Q _g	V _{DS} =30V, I _{DS} =30A, V _{GS} =10V	-	125	-	nC
Gate to Source Gate Charge	Q _{gs}		-	35	-	
Gate to Drain "Miller" Charge	Q _{gd}		-	48	-	

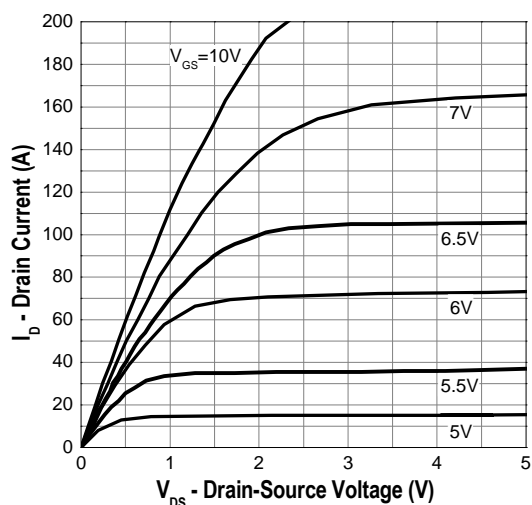
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =30A	-	-	1.3	V
Body Diode Reverse Recovery Time	t _{rr}	I _F =30A, dI/dt=100A/μs	-	32	-	ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	47	-	nC

Notes:

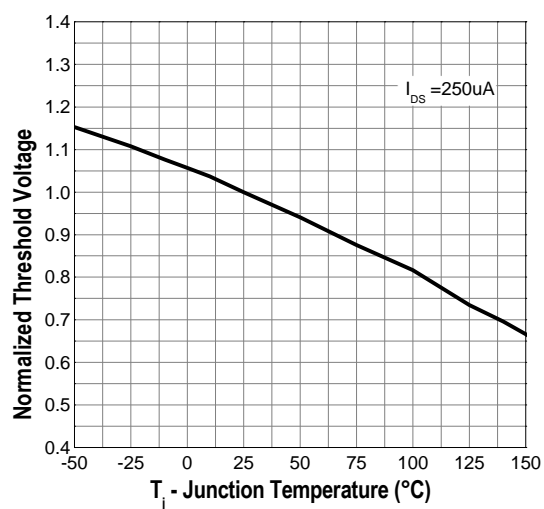
1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
2. R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R_{θJC} is guaranteed by design while R_{θJA} is determined by the user's board design. R_{θJA} shown below for single device operation on FR-4 in still air.
3. The maximum current rating is limited by package.

Typical Operating Characteristics

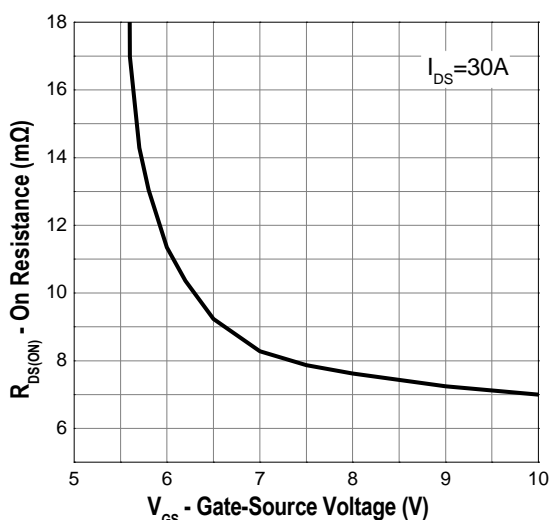
Output Characteristics



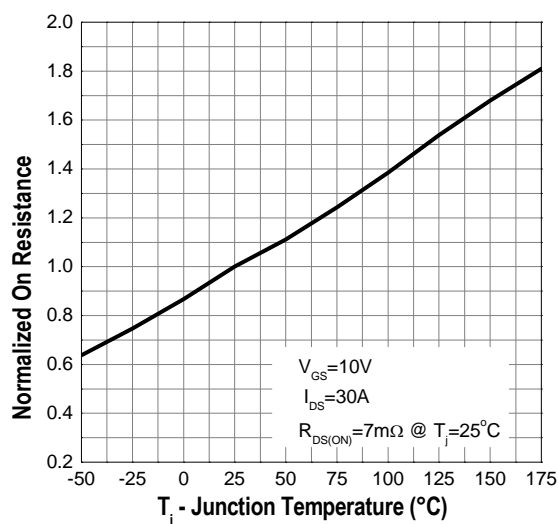
Gate Threshold Voltage



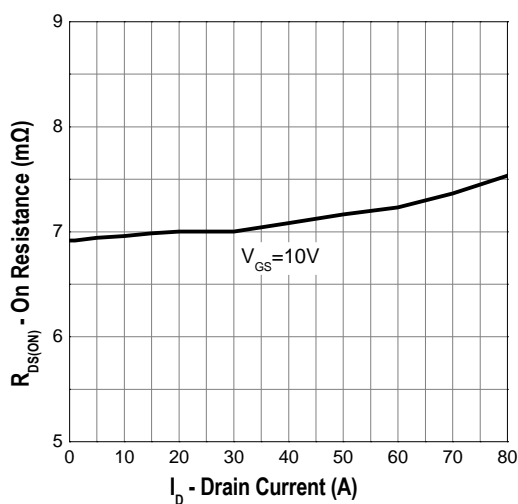
Gate-Source On Resistance



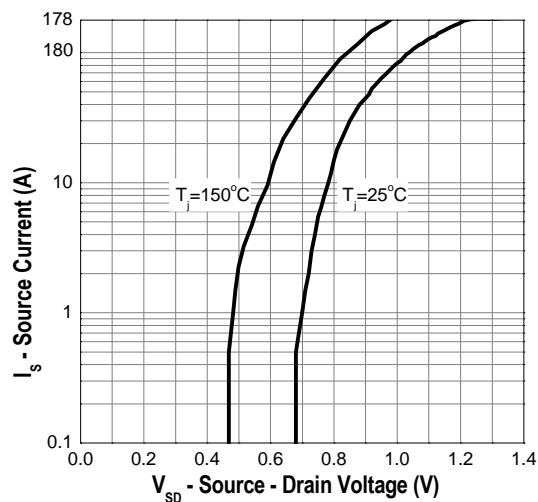
Drain-Source On Resistance



Drain-Source On Resistance

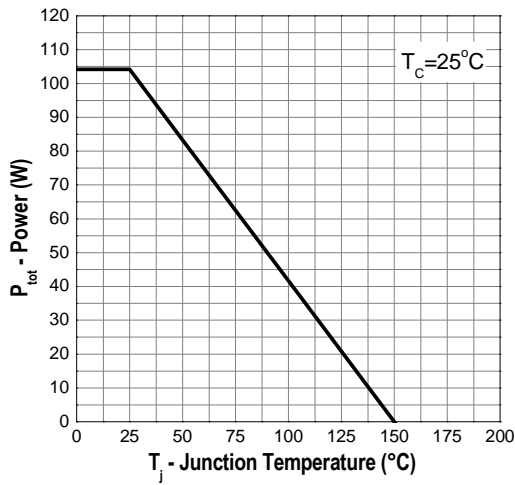


Source-Drain Diode Forward

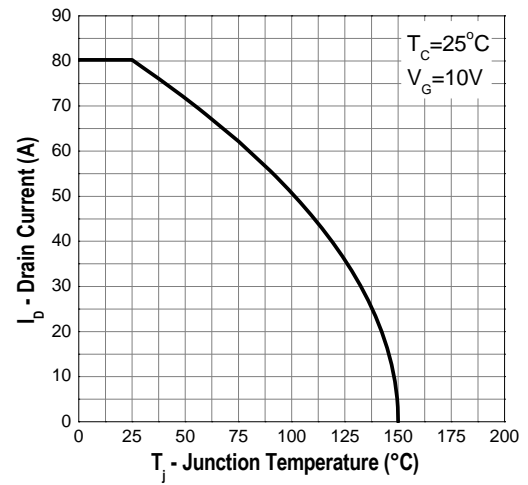


Typical Operating Characteristics (Cont.)

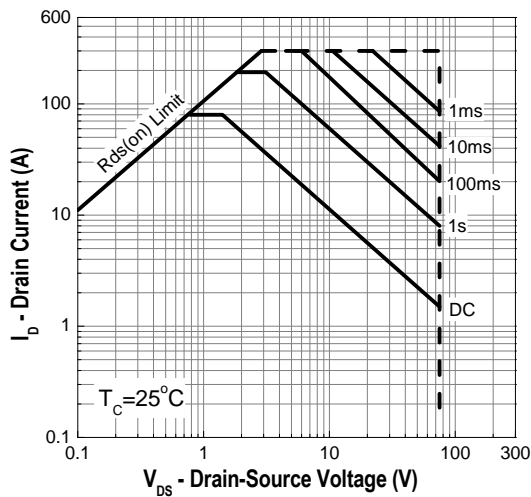
Power Dissipation



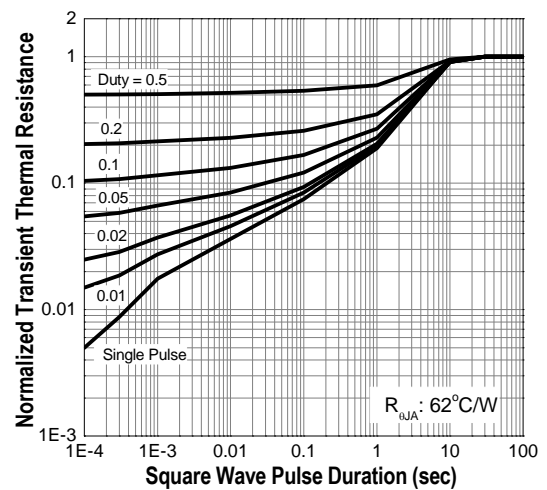
Drain Current



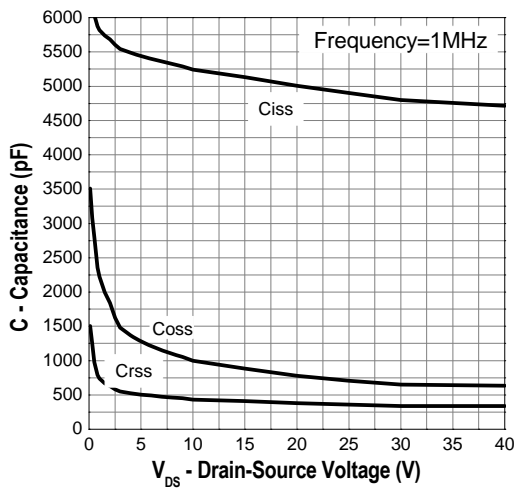
Safe Operation Area



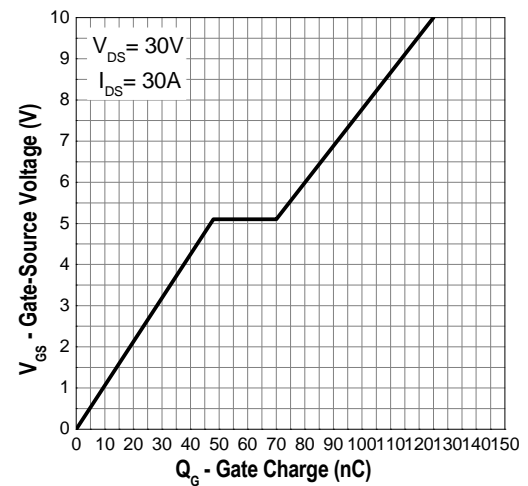
Transient Thermal Impedance



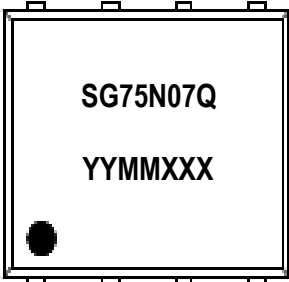
Capacitance



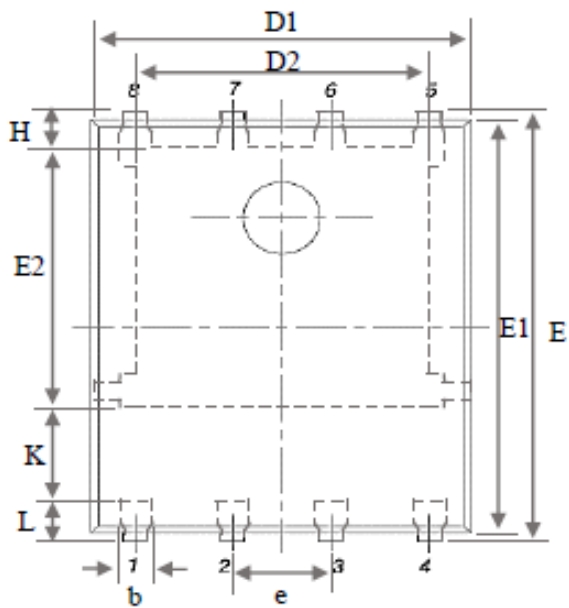
Gate Charge



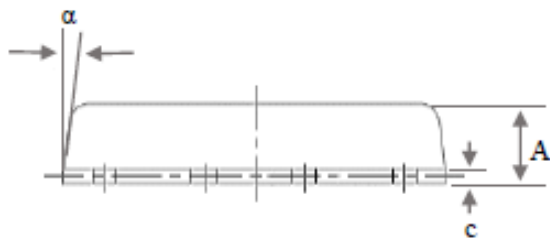
Marking Information

PDFN 5x6-8L (Q)	Marking Rule
<p>Laser Marking</p>  <p>Diagram</p>	<p><u>Line 1</u> : Device SG75N07Q</p> <p><u>Line 2</u> : Date Code YYMMXXX</p> <p>YY : Year Code MM : Month Code XXX : Serial Number</p>

Package of Dimension



Symbol	Min	Nor	Max
A	0.90	1.04	1.17
b	0.33	0.42	0.51
C	0.06	0.20	0.35
D1	4.80	5.10	5.40
D2	3.61	3.96	4.31
E	5.90	6.03	6.15
E1	5.65	5.75	5.85
E2	3.30	3.54	3.78
e	1.27 BSC		
H	0.38	0.50	0.61
L	0.38	0.55	0.71
L1	0.05	0.15	0.25

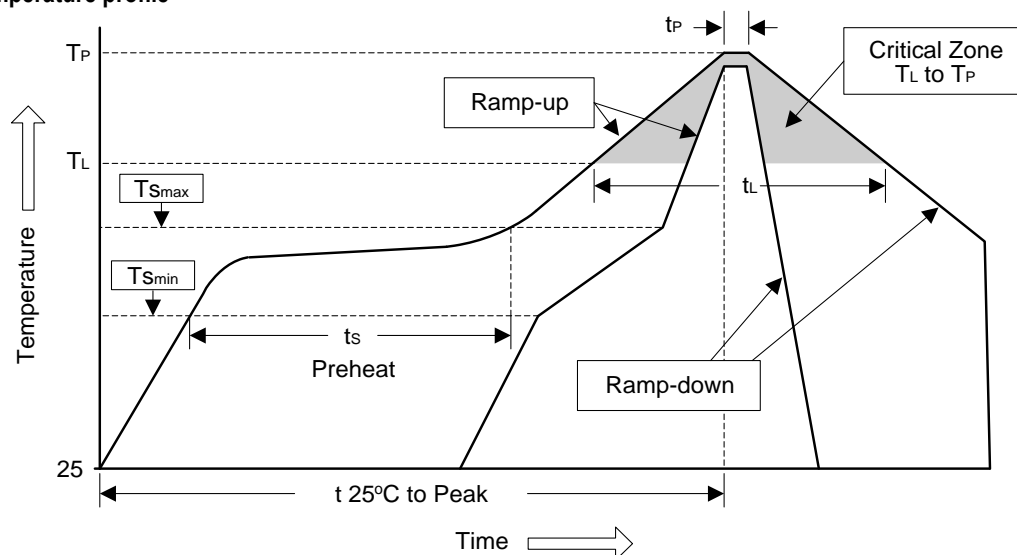


1. All dimension are in millimeters.
2. Dimension does not include burrs and mold flash/protrusions.

Soldering Methods for Silicongear's Products

1. Storage environment: Temperature=10°C to 35°C Humidity=65%±15%
2. Reflow soldering of surface-mount devices

Figure 1: Temperature profile



Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate (TL to TP)	<3°C/sec	<3°C/sec
Preheat		
- Temperature Min (TSmin)	100°C	150°C
- Temperature Max (TSmax)	150°C	200°C
- Time (min to max) (ts)	60 to 120 sec	60 to 180 sec
TSmax to TL		
- Ramp-up Rate	<3°C/sec	<3°C/sec
Time maintained above:		
- Temperature (TL)	183°C	217°C
- Time (tL)	60 to 150 sec	60 to 150 sec
Peak Temperature (TP)	240°C +0/-5°C	260°C +0/-5°C
Time within 5°C of actual Peak Temperature (tP)	10 to 30 sec	20 to 40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25°C to Peak Temperature	<6 minutes	<8 minutes

3. Flow (wave) soldering (solder dipping)

Products	Peak Temperature	Dipping Time
Pb devices.	245°C ±5°C	5sec ±1sec
Pb-Free devices.	260°C +0/-5°C	5sec ±1sec

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