



Description

The SI4166DY-T1-GE3 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



SOP-8
(SO-8)

General Features

$V_{DS} = 30V$ $I_D = 30A$

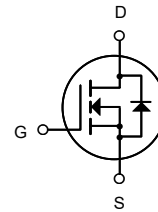
$R_{DS(ON)} < 4.5m\Omega @ V_{GS}=10V$

Application

Battery protection

Load switch

Uninterruptible power supply



N-Channel MOSFET

Ordering Information

Product ID	Pack	Brand	Qty(PCS)
SI4166DY-T1-GE3	SOP-8(SO-8)	HXY MOSFET	3000

Absolute Maximum Ratings($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Limit	Unit
V_{DS}	Drain-Source Voltage	30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current-Continuous	30	A
$I_D(100^\circ C)$	Drain Current-Continuous($T_C=100^\circ C$)	21	A
I_{DM}	Pulsed Drain Current	120	A
P_D	Maximum Power Dissipation	1.4	W
E_{AS}	Single pulse avalanche energy	156	mJ
T_J, T_{STG}	Operating Junction and Storage Temperature Range	-55 To 150	$^\circ C$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Case	90	$^\circ C/W$



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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
BV_{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	30	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =30V	---	---	1	μA
I_{GSS}	Gate-Source Leakage Current	V _{GS} =±20V, V _{DS} =0A	---	---	±100	nA
V_{GS(th)}	Gate-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250μA	1.2	1.5	2.5	V
R_{DS(on)}	Drain-Source On Resistance ⁴	V _{GS} =10V, I _D =10A	---	3.3	4.5	mΩ
		V _{GS} =4.5V, I _D =5A	---	4.6	5.5	mΩ
C_{iss}	Input Capacitance	V _{DS} =15V, V _{GS} =0V, f=1MHz	---	3100	---	pF
C_{oss}	Output Capacitance		---	370	--	
C_{rss}	Reverse Transfer Capacitance		---	286	---	
t_{d(on)}	Turn-On Delay Time	V _{DS} =15V, I _D =30A, R _{ENG} =3Ω, V _{GS} =10V	---	11	---	ns
t_r	Rise Time		---	30	---	ns
t_{d(off)}	Turn-Off Delay Time		---	49	---	ns
t_f	Fall Time		---	18	---	ns
Q_g	Total Gate Charge	V _{GS} =10V, V _{DS} =15V, I _D =30A	---	24	---	nC
Q_{gs}	Gate-Source Charge		---	12	---	nC
Q_{gd}	Gate-Drain "Miller" Charge		---	13	---	nC
V_{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =30A	---	---	1.2	V
I_S	Continuous Drain Current	V _D =V _G =0V	---	---	30	A
I_{SM}	Pulsed Drain Current		---	---	120	A
T_{rr}	Reverse Recovery Time	I _F =30A, T _J =25	---	16	---	ns
Q_{rr}	Reverse Recovery Charge	°CdI/dt=100A/us	---	7	---	nC

Notes:

1. Computed continuous current assumes the condition of T_{J,Max} while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : T_J=25°C, V_{DD}=15V, V_G=10V, L=0.5mH
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



Typical Characteristics

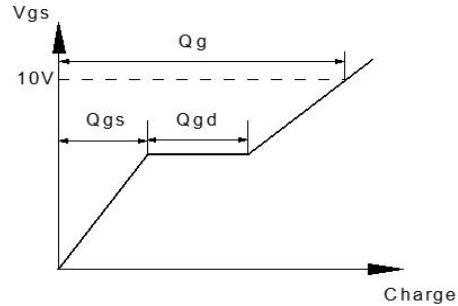
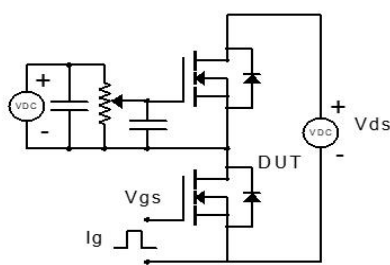


Figure 1: Gate Charge Test Circuit & Waveform

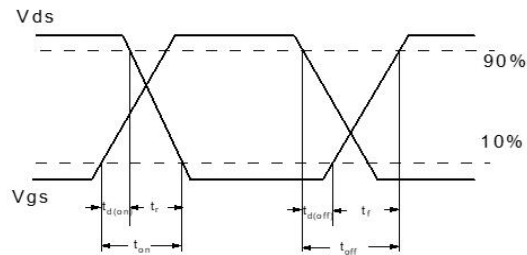
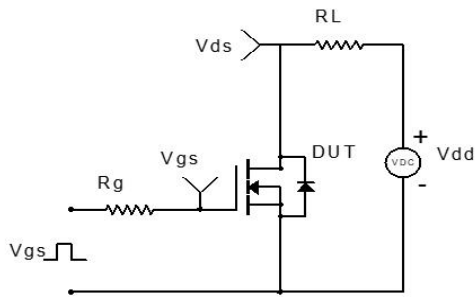


Figure 2: Resistive Switching Test Circuit & Waveform

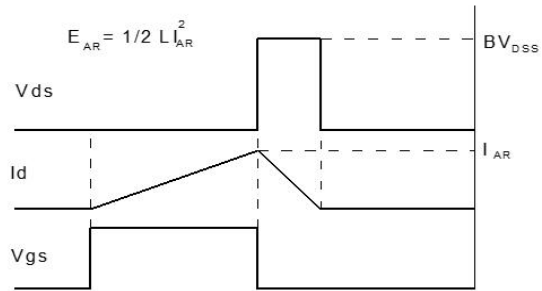
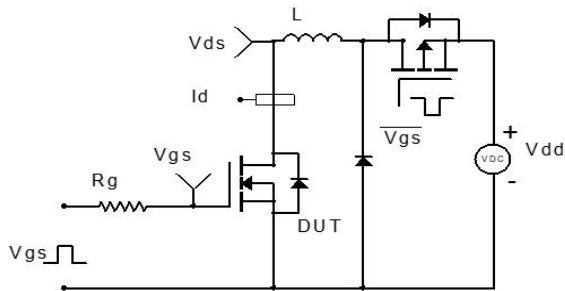


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

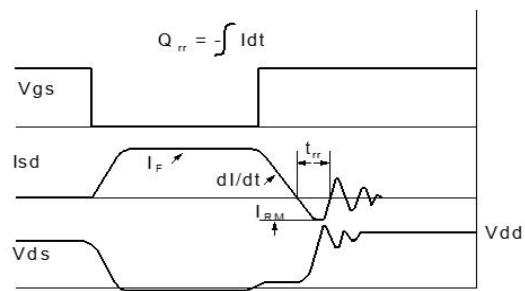
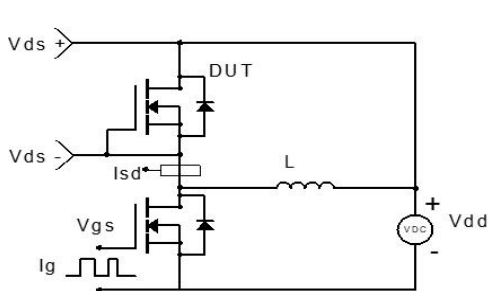
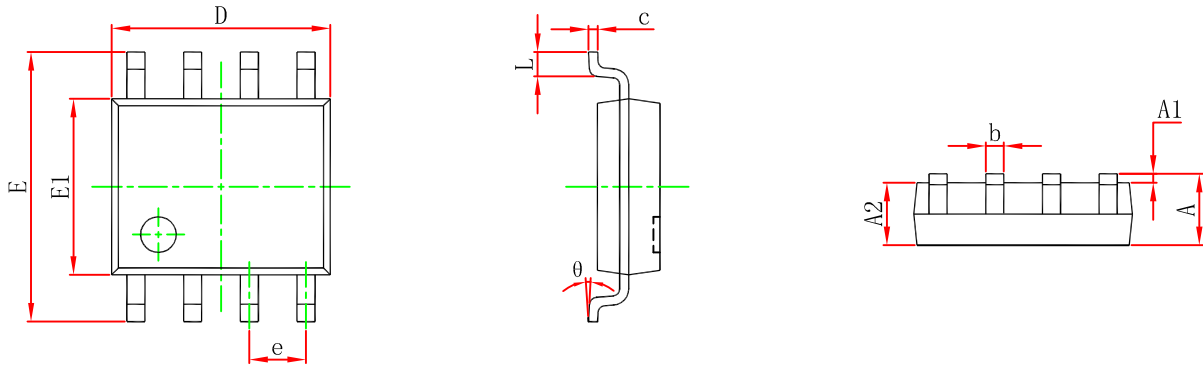


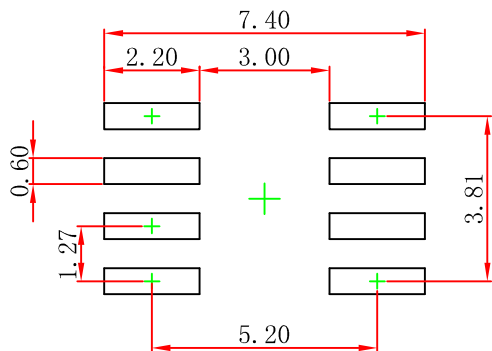
Figure 4: Diode Recovery Test Circuit & Waveform



SOP-8(SO-8) Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.007	0.010
D	4.800	5.000	0.189	0.197
e	1.270 (BSC)		0.050 (BSC)	
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°



Note:
 1. Controlling dimension: in millimeters.
 2. General tolerance: $\pm 0.05\text{mm}$.
 3. The pad layout is for reference purposes only.



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