



Description

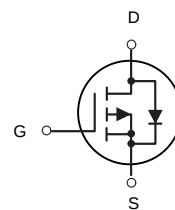
The SQD40031EL_GE3 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a Battery protection or in other Switching application.



General Features

$V_{DS} = -30V$ $I_D = -120A$

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



P-Channel MOSFET

Application

Lithium battery protection

Wireless impact

Mobile phone fast charging

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
SQD40031EL_GE3	TO-252-2L	HXY MOSFET	2500

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

Symbol	Parameter	Max.	Units
VDSS	Drain-Source Voltage	-30	V
VGSS	Gate-Source Voltage	± 20	V
ID	Continuous Drain Current $T_c = 25^\circ C$	-120	A
ID	Continuous Drain Current $T_c = 100^\circ C$	-80	A
IDM	Pulsed Drain Current ^{note1}	-470	A
EAS	Single Pulsed Avalanche Energy ^{note2}	580	mJ
PD	Power Dissipation $T_c = 25^\circ C$	100	W
RθJC	Thermal Resistance, Junction to Case	1.4	$^\circ C/W$
TJ, TSTG	Operating and Storage Temperature Range	-55 to +175	$^\circ C$



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

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250μA	-30			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-30V, V _{GS} =0V			-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} =±20V, V _{DS} =0V			±100	nA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.7	-2.5	V
g _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-20A		65		S
R _{DS(on)}	Drain-Source On-State Resistance	V _{GS} =-10V, I _D =-20A		3.7	4.5	mΩ
		V _{GS} =-4.5V, I _D =-20A		6	8.2	mΩ
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1.0MHz		7000		pF
C _{oss}	Output Capacitance			820		pF
C _{rss}	Reverse Transfer Capacitance			540		pF
R _g	Gate resistance	V _{GS} =0V, V _{DS} =0V, f=1.0MHz		2.2		Ω
t _{d(on)}	Turn-on Delay Time	V _{GS} =-10V, V _{DS} =-15V, R _L =0.75Ω, R _{GEN} =3Ω		14		nS
t _r	Turn-on Rise Time			13		nS
t _{d(off)}	Turn-Off Delay Time			65		nS
t _f	Turn-Off Fall Time			37		nS
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-15V, I _D =-20A		130		nC
Q _{gs}	Gate-Source Charge			12		nC
Q _{gd}	Gate-Drain Charge			31		nC
I _{SD}	Source-Drain Current (Body Diode)				-108	A
V _{SD}	Forward on Voltage (Note 3)	V _{GS} =0V, I _S =-20A			-1.2	V
t _{rr}	Reverse Recovery Time	I _F =-20A, di/dt=100A/μs		30		ns
Q _{rr}	Reverse Recovery Charge	I _F =-20A, di/dt=100A/μs		40		nC

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature.

Notes 2.E_{AS} condition: T_J=25°C, V_{DD}=15V, V_G=-10V, R_g=25Ω, L=0.5mH.

Notes 3.Repetitive Rating: Pulse width limited by maximum junction temperature.



Typical Electrical And Thermal Characteristics (Curves)

Figure 1. Output Characteristics

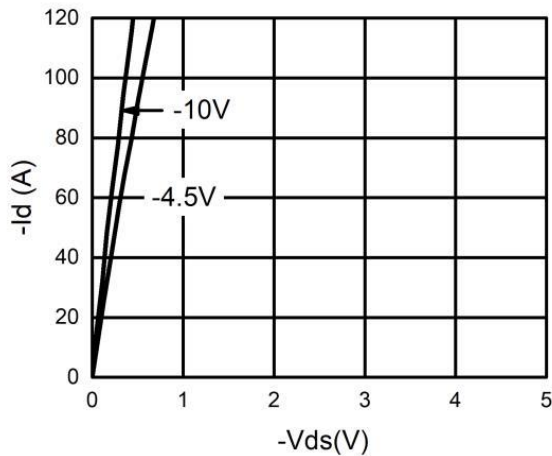


Figure 2. Transfer Characteristics

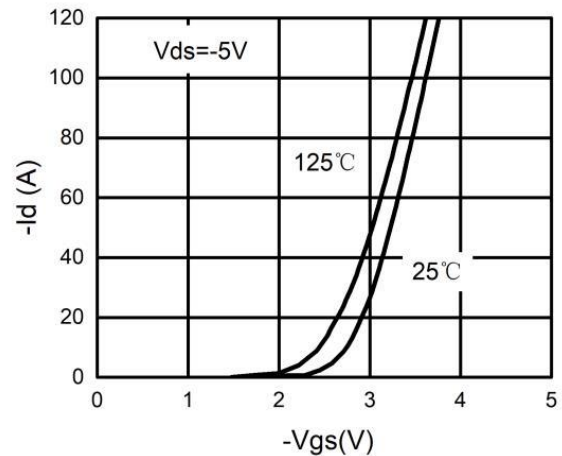


Figure 3. Power Dissipation

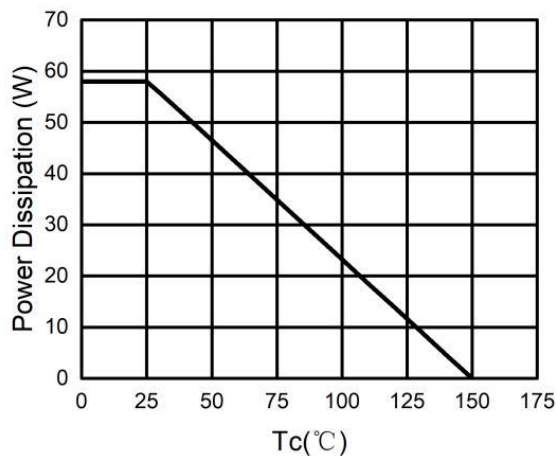


Figure 4. Drain Current

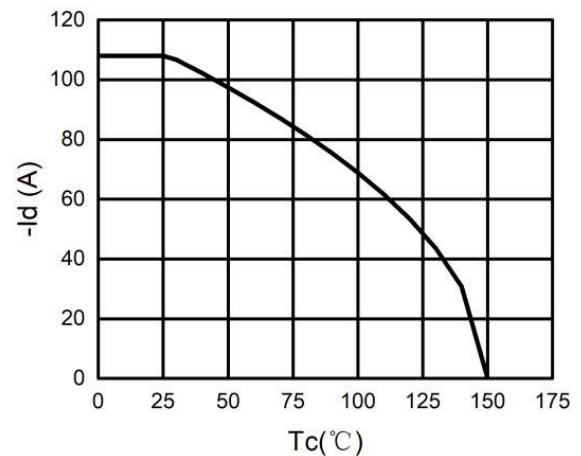


Figure 5. BV_{DSS} vs Junction Temperature

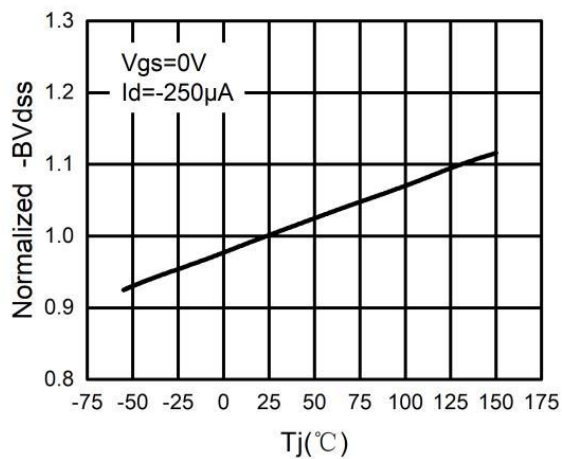


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

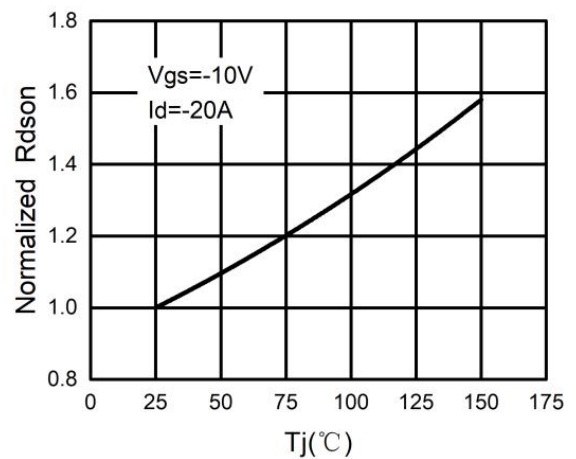




Figure 7. Gate Charge Waveforms

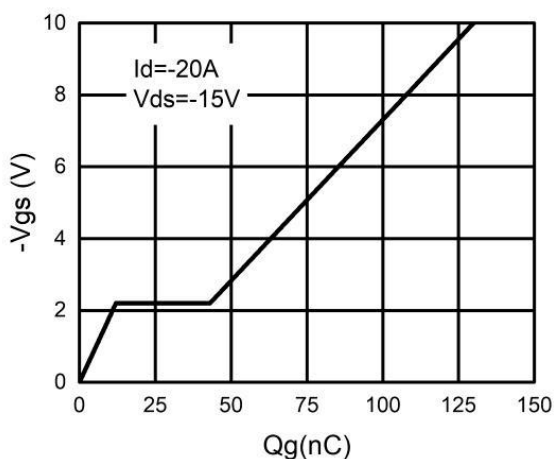


Figure 8. Capacitance

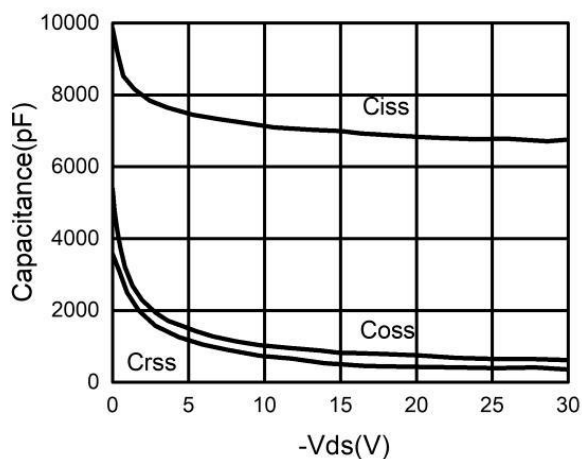


Figure 9. Body-Diode Characteristics

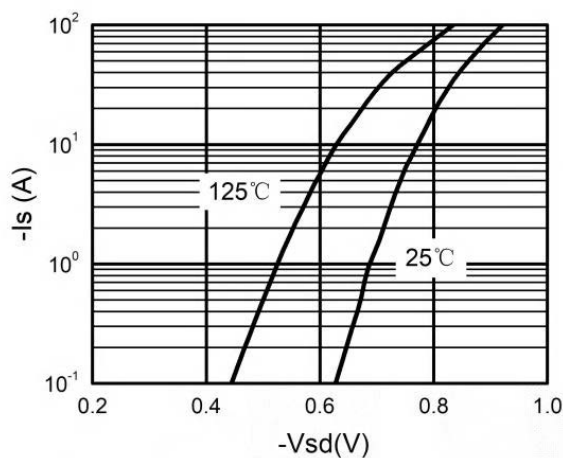
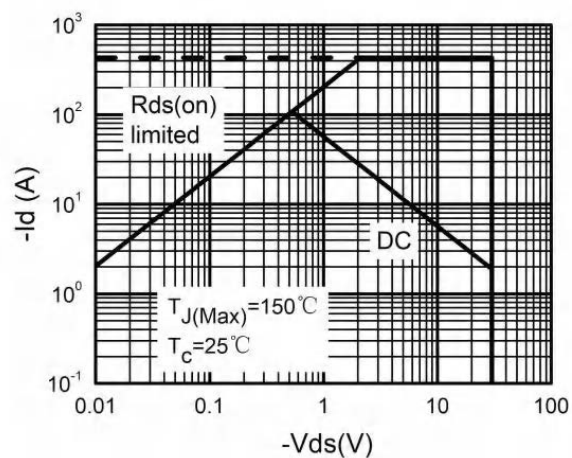


Figure 10. Maximum Safe Operating Area





TO-252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	



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