

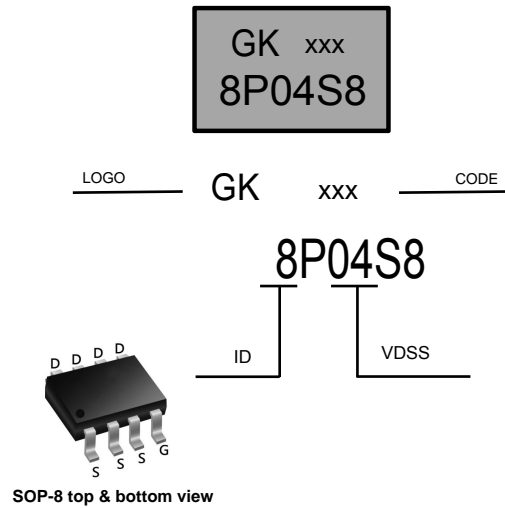
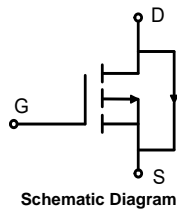
Description

- Split Gate Trench MOSFET technology
- Excellent package for heat dissipation
- High density cell design for low $R_{DS(ON)}$

V_{DSS} -40 V
 I_D -8 A
 $R_{DS(ON)}$ 30m Ω

Features

- Power Management Switches
- DC/DC Converter



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$	-8
		$T_C=100^\circ\text{C}$	-5
Pulsed Drain Current ¹	I_{DM}	-30	A
Single Pulse Avalanche Energy ²	E_{AS}	12	mJ
Total Power Dissipation	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Thermal Resistance from Junction-to-Ambient ³	$R_{\theta JA}$	25	$^\circ\text{C/W}$
Thermal Resistance from Junction-to-Case	$R_{\theta JC}$	2.5	$^\circ\text{C/W}$

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

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V_{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-40	-	-	V
Gate-body Leakage current	I_{GSS}	V _{DS} = 0V, V _{GS} = ±20V	-	-	±100	nA
Zero Gate Voltage Drain Current	T _J =25°C	V _{DS} = -40V, V _{GS} = 0V	-	-	-1	μA
	T _J =100°C		-	-	-100	
Gate-Threshold Voltage	V_{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-1.0	-1.5	-2.5	V
Drain-Source On-Resistance ⁴	R_{DS(on)}	V _{GS} = -10V, I _D = -6A	-	30	40	mΩ
		V _{GS} = -4.5V, I _D = -3A	-	40	48	
Forward Transconductance ⁴	g_{fs}	V _{DS} = -10V, I _D = -6A	-	16	-	S
Dynamic Characteristics⁵						
Input Capacitance	C_{iss}	V _{DS} = -20V, V _{GS} = 0V, f = 1MHz	-	1080	-	pF
Output Capacitance	C_{oss}		-	87	-	
Reverse Transfer Capacitance	C_{rss}		-	77	-	
Gate Resistance	R_g	f = 1MHz	-	11	-	Ω
Switching Characteristics⁵						
Total Gate Charge	Q_g	V _{GS} = -10V, V _{DS} = -20V, I _D = -6A	-	17	-	nC
Gate-Source Charge	Q_{gs}		-	4.2	-	
Gate-Drain Charge	Q_{gd}		-	3.7	-	
Turn-On Delay Time	t_{d(on)}	V _{GS} = -10V, V _{DD} = -20V, R _G = 3Ω, I _D = -6A	-	5.9	-	ns
Rise Time	t_r		-	7.1	-	
Turn-Off Delay Time	t_{d(off)}		-	25	-	
Fall Time	t_f		-	8.2	-	
Drain-Source Body Diode Characteristics						
Diode Forward Voltage ⁴	V_{SD}	I _S = -6A, V _{GS} = 0V	-	-	-1.2	V
Continuous Source Current	T _C =25°C	I_S	-	-	-8	A

Note :

1. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C.
2. The EAS data shows Max. rating . The test condition is V_{DD}= -25V, V_{GS}= -10V, L= 0.1mH, I_{AS}= -19A.
3. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.

RATING AND CHARACTERISTIC CURVES

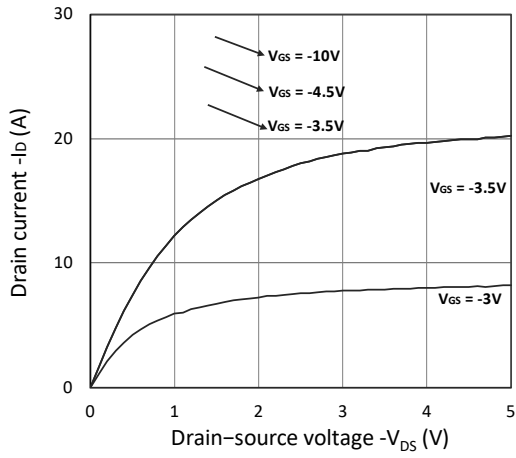


Figure 1. Output Characteristics

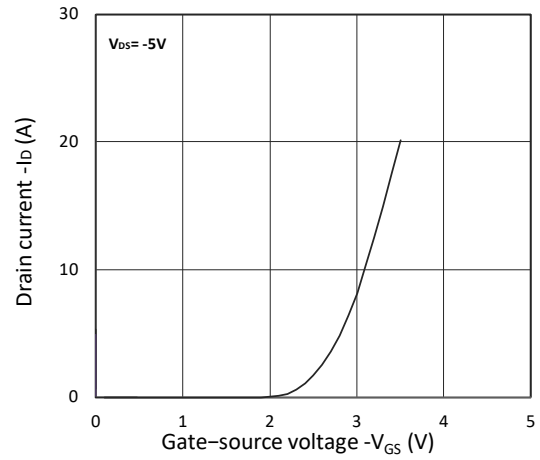


Figure 2. Transfer Characteristics

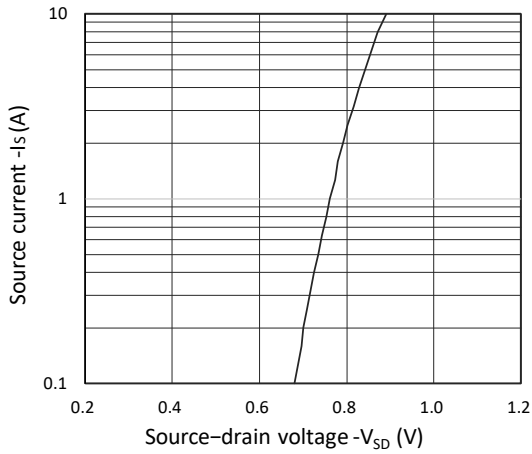


Figure 3. Forward Characteristics of Reverse

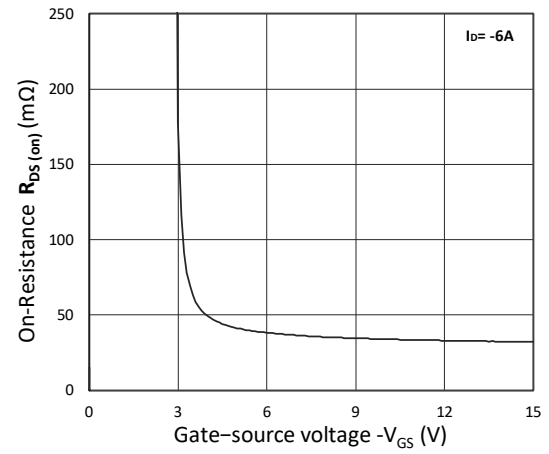


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

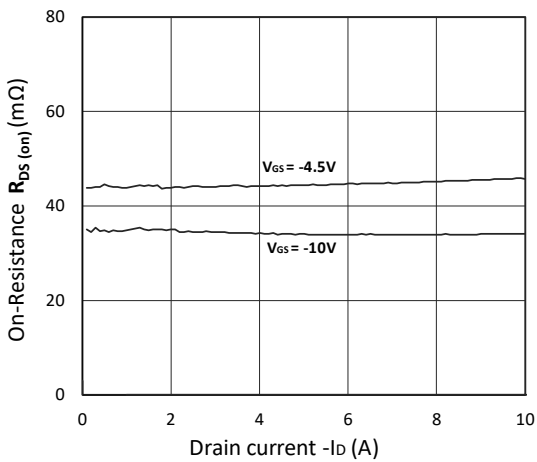


Figure 5. $R_{DS(ON)}$ vs. I_D

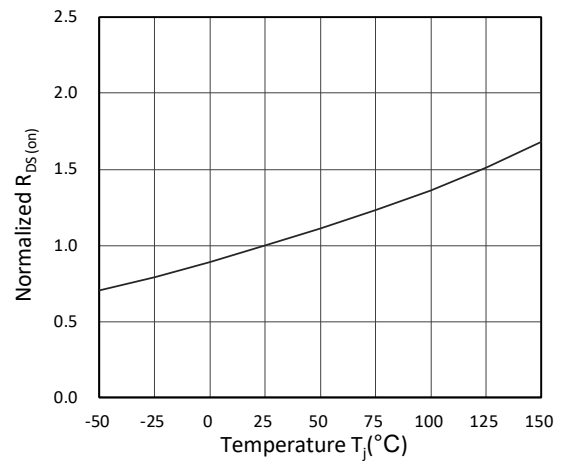


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature

RATING AND CHARACTERISTIC CURVES

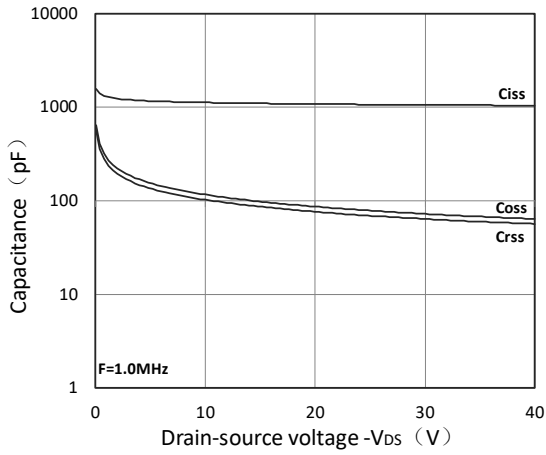


Figure 7. Capacitance Characteristics

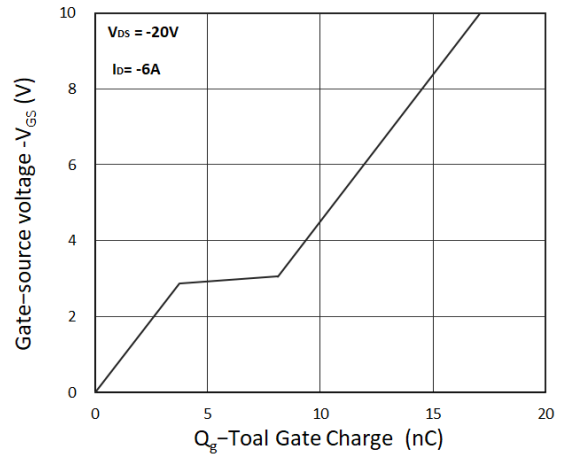


Figure 8. Gate Charge Characteristics

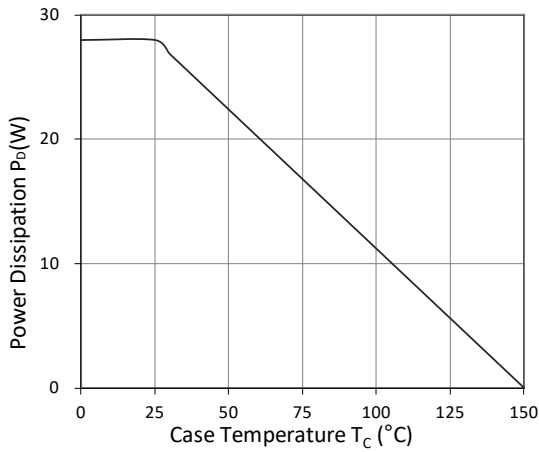


Figure 9. Power Dissipation

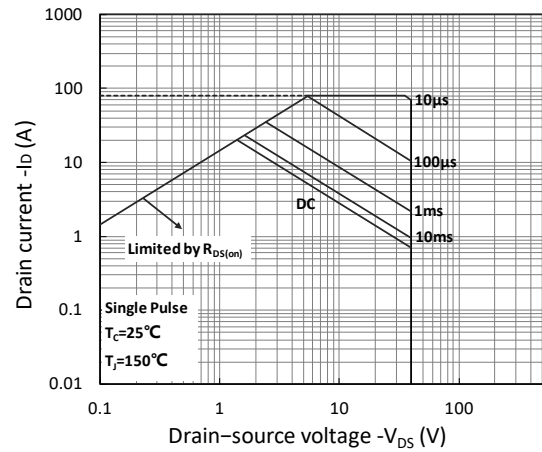
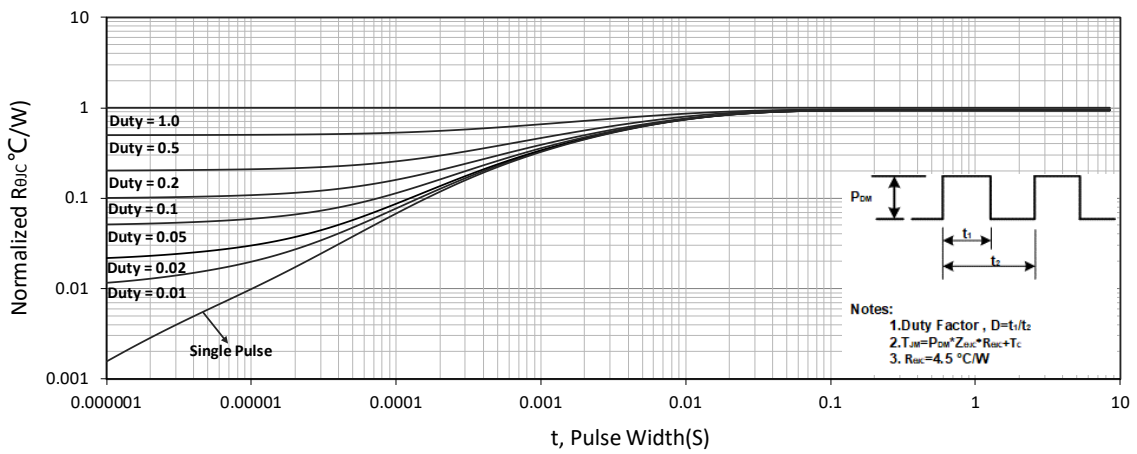


Figure 10. Safe Operating Area



Test Circuit

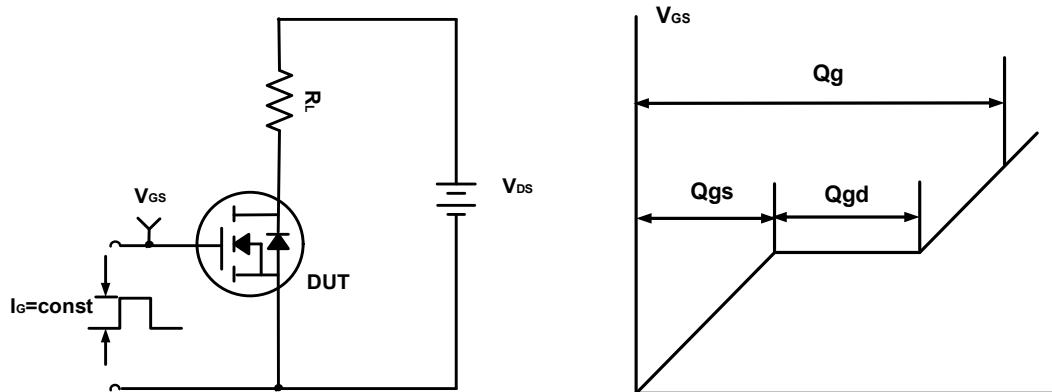


Figure A. Gate Charge Test Circuit & Waveforms

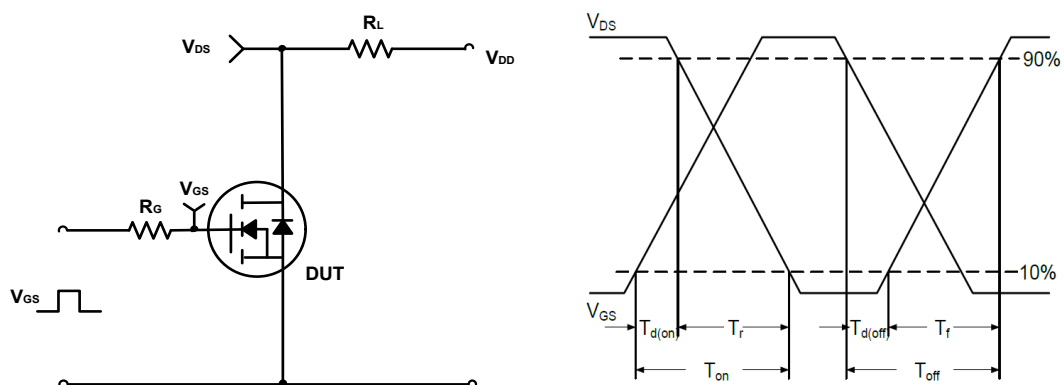


Figure B. Switching Test Circuit & Waveforms

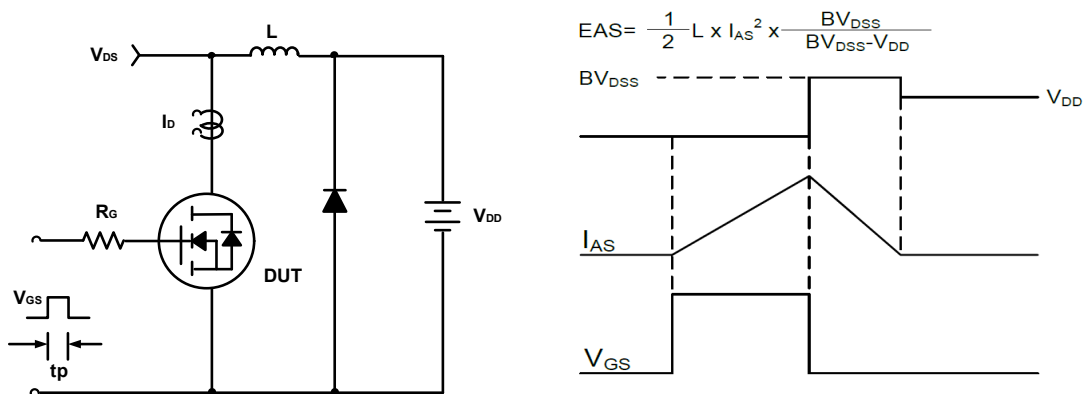
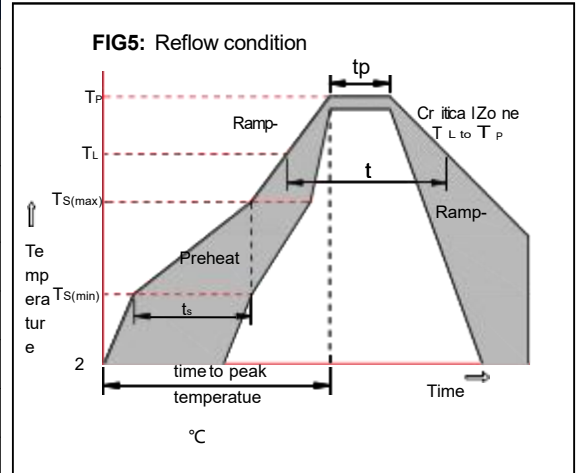


Figure C. Unclamped Inductive Switching Circuit & Waveforms

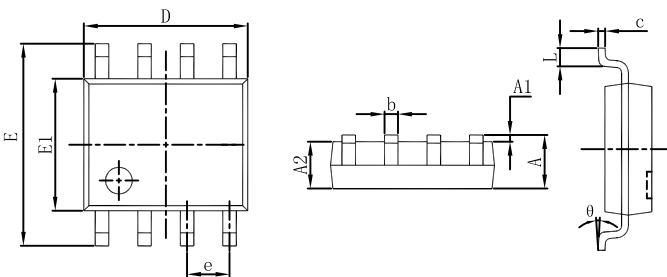
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C

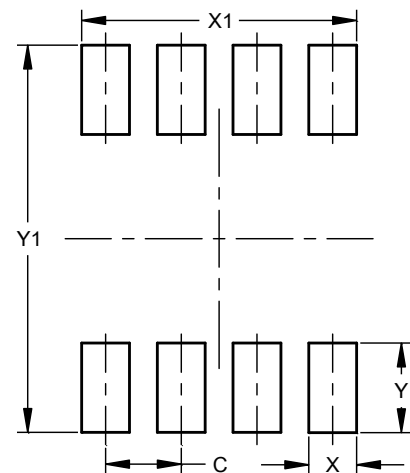


Package Dimensions & Suggested Pad Layout

SOP-8



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°



Dimensions	Value (in mm)
C	1.27
X	0.70
X1	4.51
Y	2.00
Y1	7.00

Tape & reel specification

Tape		Symbol	Dimension (mm)
		P0	4.00±0.20
		P1	8.00±0.20
		P2	2.00±0.20
		D0	1.55±0.20
		D1	1.55±0.20
		E	1.75±0.15
		F	5.50±0.20
		W	12.00±0.20
		A0	7.00±0.20
		B0	5.70±0.20
		K0	1.35±0.20
		T	0.23±0.20
		13" Reel	
		D3	73Min.
		D4	13.5±2.5
		W1	16.0±3.0
		Quantity: 3000PCS	
13" Reel		D2	330.0±5.0
		D3	73Min.
		D4	13.5±2.5
		W1	16.0±3.0
		Quantity: 4000PCS	