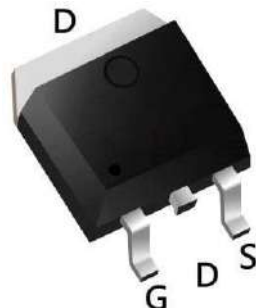


N-Ch 80V Fast Switching MOSFETs

Features:

- ★ 100% EAS Guaranteed
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

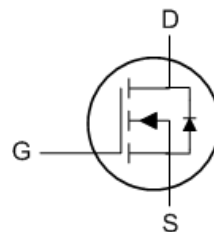


Description:

The KWH8024A is the high cell density trenched N-ch MOSFETs, which provide excellent $R_{DS(on)}$ and gate charge for most of the synchronous buck converter applications.

The KWH8024A meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

TO263 Pin Configuration



Product Summary

BVDSS	$R_{DS(on)}$	I_D
80V	6.5mΩ	108A

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	80	V
V_{GS}	Gate-Source Voltage	±20	V
$I_D@T_C=25^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ¹	108	A
$I_D@T_C=100^{\circ}C$	Continuous Drain Current, V_{GS} @ 10V ¹	68	A
I_{DM}	Pulsed Drain Current ²	200	A
EAS	Single Pulse Avalanche Energy ³	125	mJ
I_{AS}	Avalanche Current	50	A
$P_D@T_C=25^{\circ}C$	Total Power Dissipation ⁴	149	W
T_{STG}	Storage Temperature Range	-55 to 150	°C
T_J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient ¹	---	55	°C/W
$R_{\theta JC}$	Thermal Resistance Junction-Case ¹	---	0.84	°C/W

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	80	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=10V, I_D=30A$	---	---	6.5	m Ω
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	2.5	---	4.5	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=64V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=64V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	5	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=5V, I_D=30A$	---	50	---	S
Q_g	Total Gate Charge (10V)	$V_{DS}=64V, V_{GS}=10V, I_D=30A$	---	83.7	---	nC
Q_{gs}	Gate-Source Charge		---	28.6	---	
Q_{gd}	Gate-Drain Charge		---	29.3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=40V, V_{GS}=10V, R_G=3.3\Omega, I_D=30A$	---	38.1	---	ns
T_r	Rise Time		---	73.3	---	
$T_{d(off)}$	Turn-Off Delay Time		---	51.6	---	
T_f	Fall Time		---	26.1	---	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, f=1\text{MHz}$	---	5580	---	pF
C_{oss}	Output Capacitance		---	571	---	
C_{rss}	Reverse Transfer Capacitance		---	278	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,5}	$V_G=V_D=0V$, Force Current	---	---	70	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=A, T_J=25^\circ\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=30A, dI/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	26.7	---	nS
Q_{rr}	Reverse Recovery Charge		---	27.9	---	nC

Note :

- 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2.The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 3.The EAS data shows Max. rating . The test condition is $V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=50A$
- 4.The power dissipation is limited by 150°C junction temperature
- 5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
- 6.Package limitation current is 70A.

Typical Characteristics

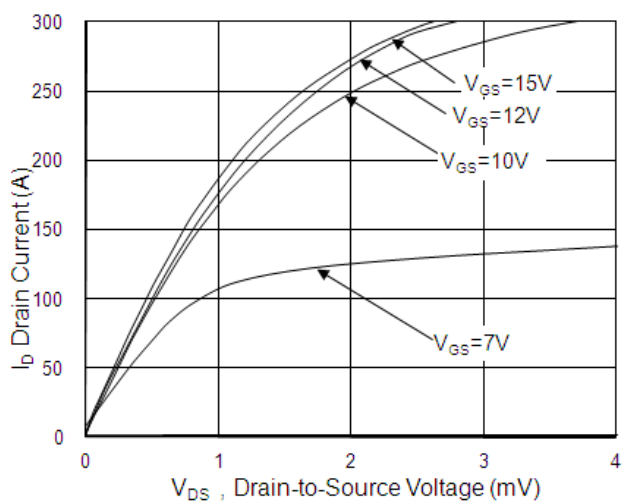


Fig.1 Typical Output Characteristics

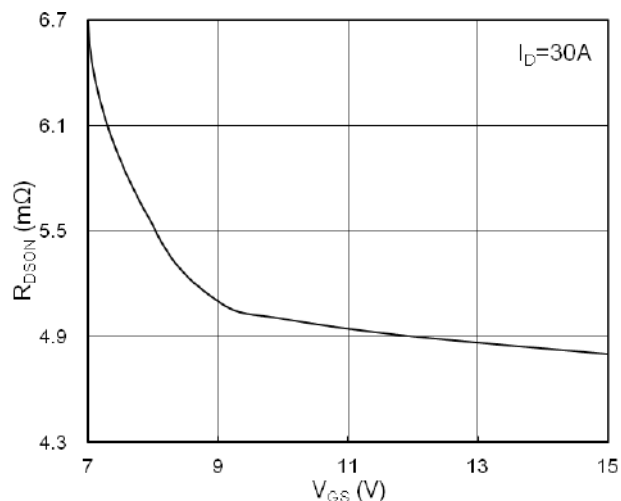


Fig.2 On-Resistance vs. G-S Voltage

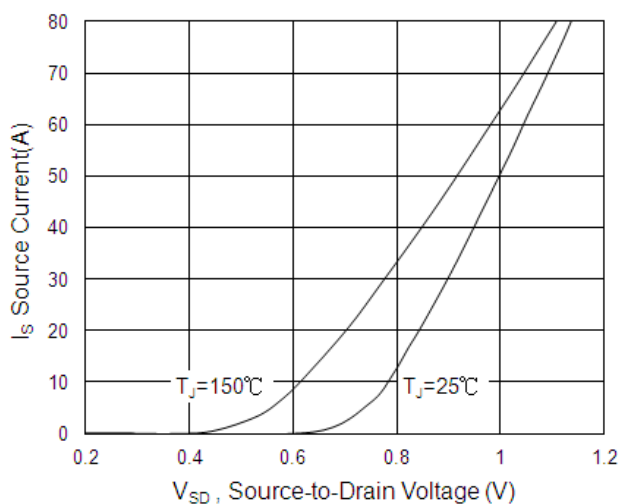


Fig.3 Source Drain Forward Characteristics

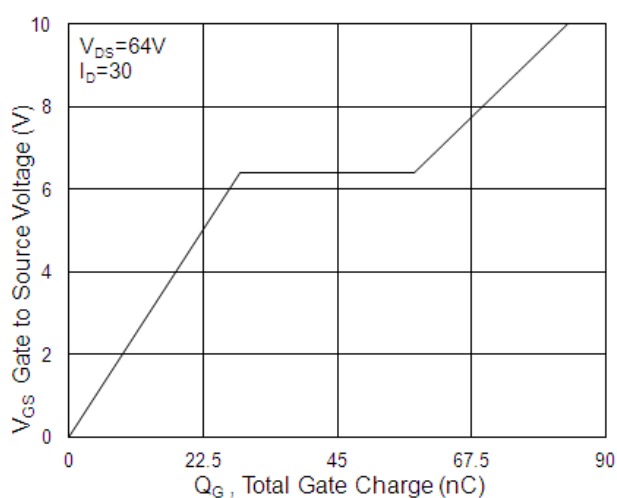


Fig.4 Gate-Charge Characteristics

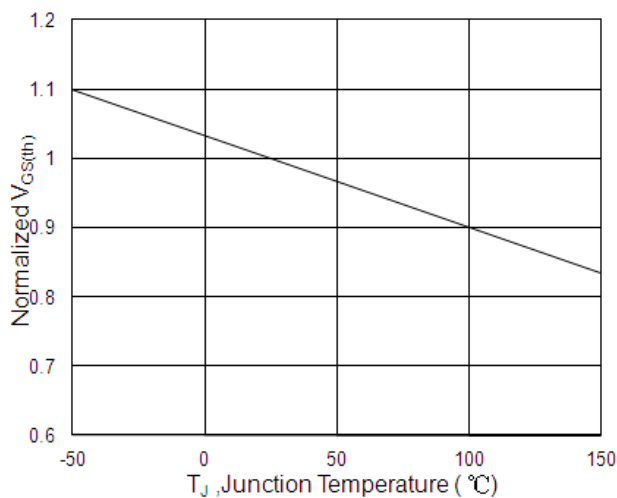


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

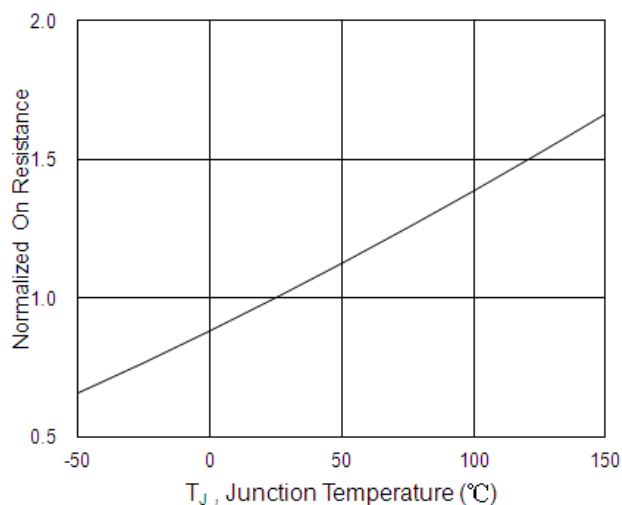


Fig.6 Normalized $R_{DS(on)}$ vs. T_J

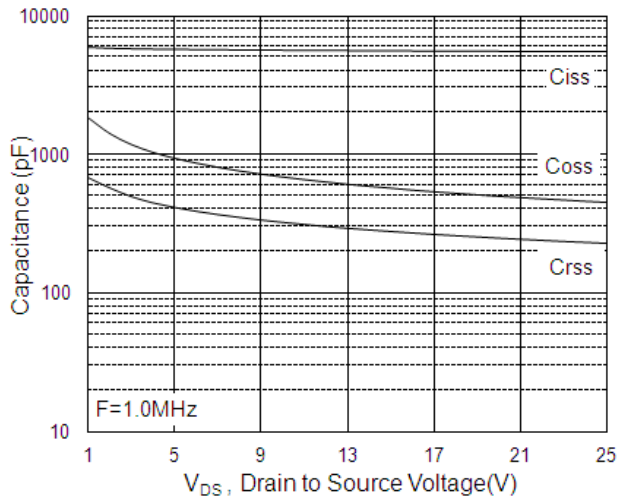


Fig.7 Capacitance

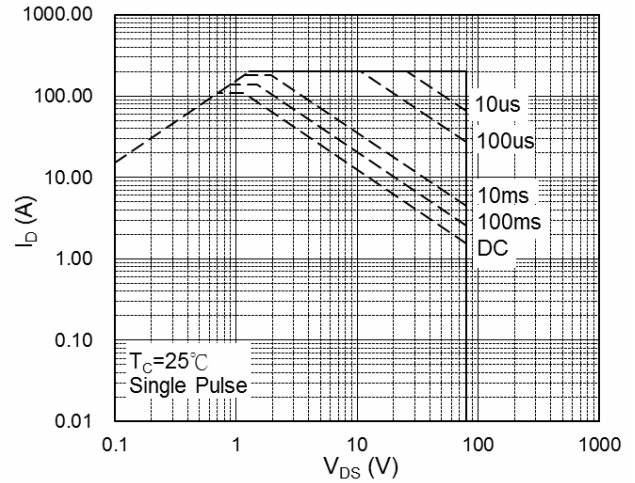


Fig.8 Safe Operating Area

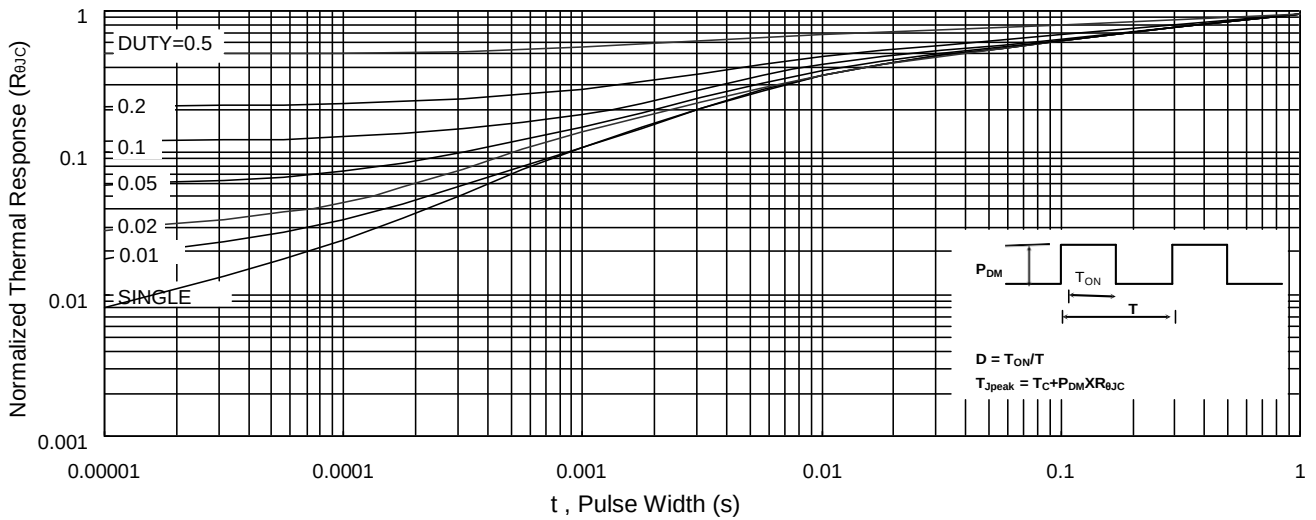


Fig.9 Normalized Maximum Transient Thermal Impedance

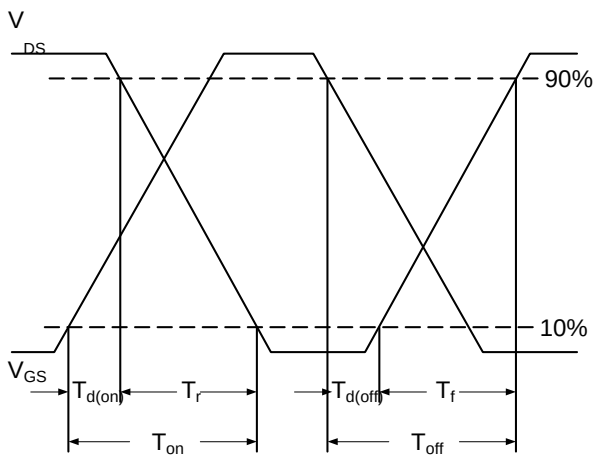


Fig.10 Switching Time Waveform

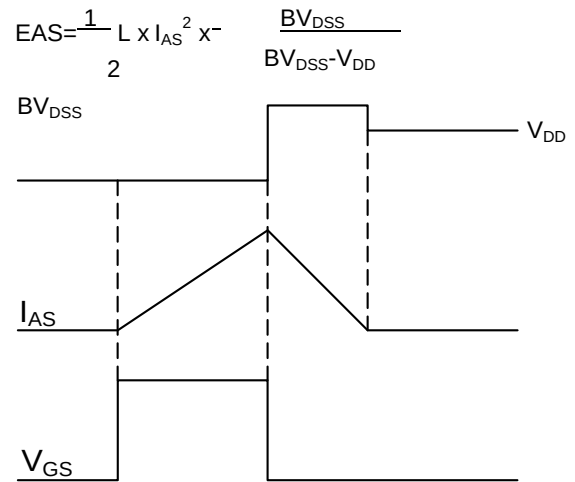
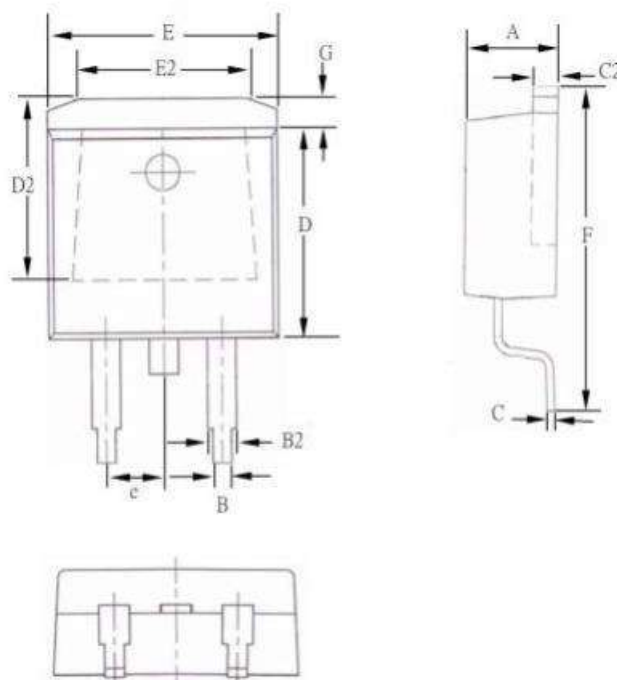


Fig.11 Unclamped Inductive Switching Waveform

TO263 Package Outline Dimensions



SYMBOL S	MILLIMETERS			INCHES		
	MIN	NOM		MIN	NOM	
A	4.06	—	4.83	0.160	—	0.190
B	0.51	—	0.99	0.020	—	0.039
B2	1.14	—	1.78	0.045	—	0.070
C	0.34	—	0.74	0.013	—	0.029
C2	1.14	—	1.65	0.045	—	0.065
D	8.38	—	9.65	0.330	—	0.380
D2	6.86	—	7.86	0.270	—	0.309
E	9.65	—	10.67	0.380	—	0.420
E2	6.22	—	7.40	0.245	—	0.291
F	13.08	—	15.50	0.515	—	0.610
G	0.68	—	1.68	0.027	—	0.066
e	—	2.54	—	—	0.100	—