3060K（文件编号：S&CIC1695） N-Channel Trench Power MOSFET

General Description

The 3060K uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gate voltages as low as 5V. This device is suitable for use as a wide variety of applications.

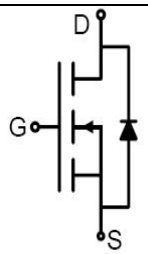
Features

- VDS = 30V,ID =60A
  RDS(ON) < 7mΩ @ VGS =10V RDS(ON) < 12mΩ @ VGS =5V
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

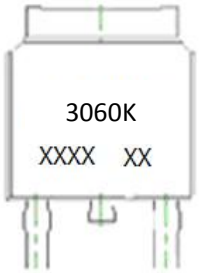
Application

- PWM applications
- Load switch
- Power management

100% UIS TESTED!
100% ΔVds TESTED!



Schematic Diagram



Marking and pin Assignment



TO-252(DPAK) top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
3060K	3060K	TO-252	325mm	16mm	2500

Table 1. Absolute Maximum Ratings (T_A=25℃)

Symbol	Parameter	Value	Unit
VDS	Drain-Source Voltage (VGS=0V)	30	V
VGS	Gate-Source Voltage (VDS=0V)	±20	V
ID	Drain Current-Continuous(Tc=25℃) **(Note 1)**	60	A
	Drain Current-Continuous(Tc=100℃)	38	A
IDM (pluse)	Drain Current-Continuous@ Current-Pulsed **(Note 2)**	250	A
PD	Maximum Power Dissipation(Tc=25℃)	65	W
	Maximum Power Dissipation(Tc=100℃)	33	W
EAS	Avalanche energy **(Note 3)**	120	mJ
TJ,TSTG	Operating Junction and Storage Temperature Range	-55 To 175	℃

Table 2. Thermal Characteristic

Symbol	Parameter	Typ	Max	Unit
RθJC	Thermal Resistance,Junction-to-Case	-	2.3	℃/W

Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

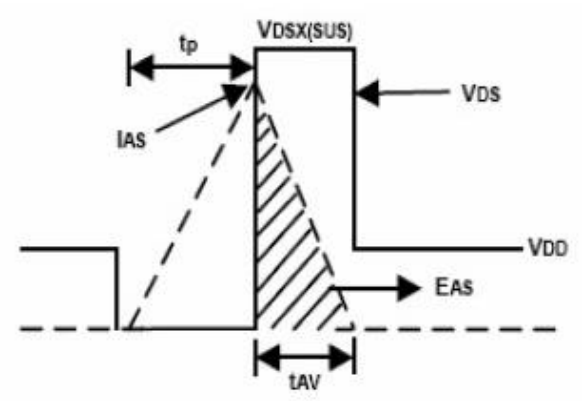
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BVDSS	Drain-Source Breakdown Voltage	VGS=0V ID=250μA	30			V
IDSS	Zero Gate Voltage Drain Current	VDS=30V,VGS=0V			1	μA
IGSS	Gate-Body Leakage Current	VGS=±20V,VDS=0V			±100	nA
VGS(th)	Gate Threshold Voltage	VDS=VGS,ID=250μA	1.0	1.5	2.5	V
gFS	Forward Transconductance	VDS=5V,ID=20A		20		S
RDS (ON)	Drain-Source On-State Resistance	VGS=10V, ID=20A(Tc=25℃)		5.5	7.0	mΩ
		VGS=10V, ID=20A (Tc=125℃)		7.3	11	mΩ
		VGS=5V, ID=15A		7.8	12	mΩ
Dynamic Characteristics						
Ciss	Input Capacitance	VDS=15V,VGS= 0V,		1450		pF
Coss	Output Capacitance			230		pF
Crss	Reverse Transfer Capacitance			185		pF
Rg	Gate resistance	VGS=0V, VDS=0V,f=1.0MHz		1.7		Ω
Switching Times						
td(on)	Turn-on Delay Time	VGS=10V, VDS=15V, RL=0.75Ω,RGEN=		9		nS
tr	Turn-on Rise Time			26		nS
td(off)	Turn-Off Delay Time			35		nS
tf	Turn-Off Fall Time			8		nS
Qg	Total Gate Charge	VGS=10V, VDS=25V, ID=14A		35		nC
Qgs	Gate-Source Charge			6		nC
Qgd	Gate-Drain Charge			12		nC
Source-Drain Diode Characteristics						
ISD	Source-Drain Current(Body Diode)				60	A
VSD	Forward on Voltage	VGS=0V,IS=20A			1.2	V

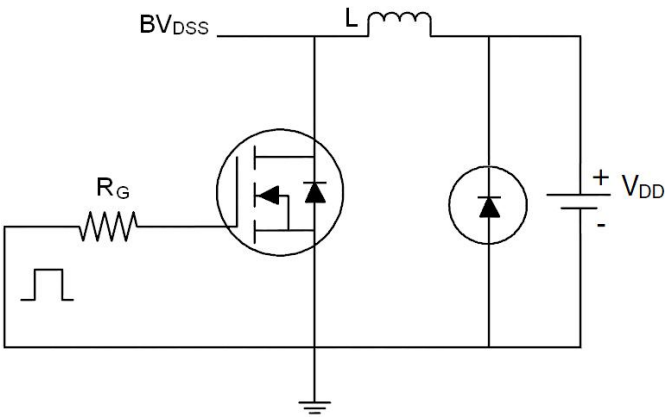
Notes 1.The maximum current rating is package limited.

Notes 2.Repetitive Rating: Pulse width limited by maximum junction temperature Notes 3.EAS condition: TJ=25℃,VDD=15V,VG=10V, RG=25Ω

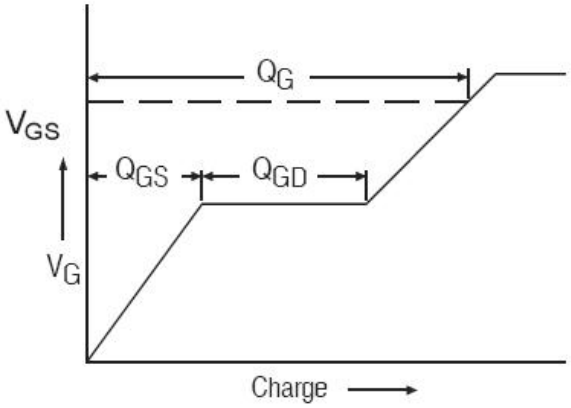
Test Circuit

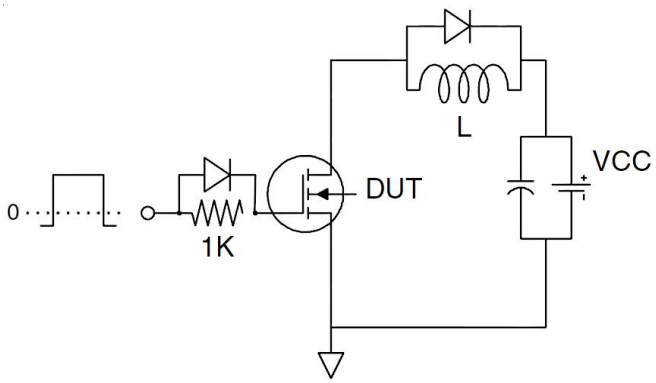
1) E_{AS} Test Circuits



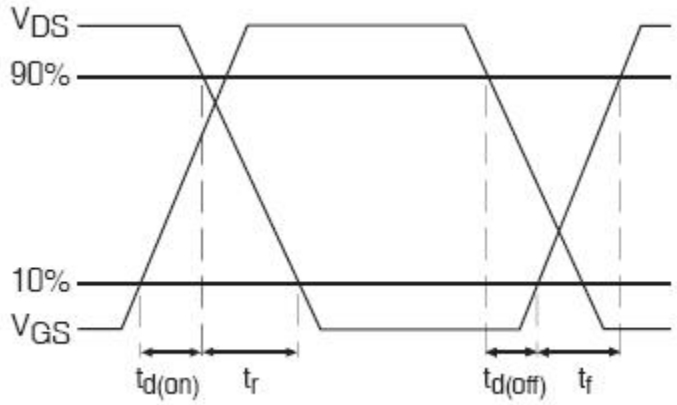


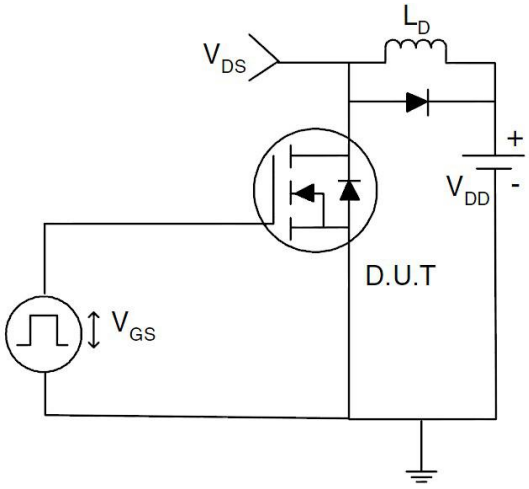
2) Gate Charge Test Circuit:





3) Switch Time Test Circuit：

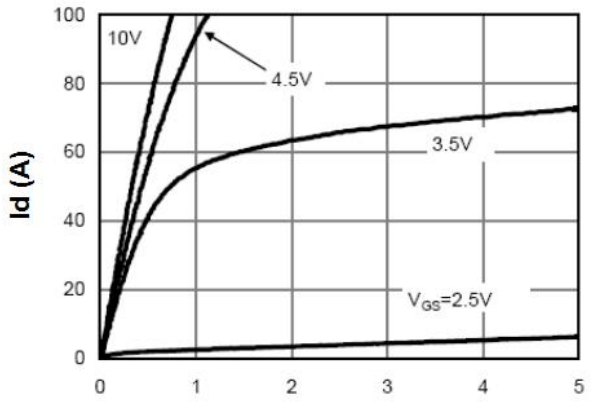




3060K（文件编号：S&CIC1695） N-Channel Trench Power MOSFET

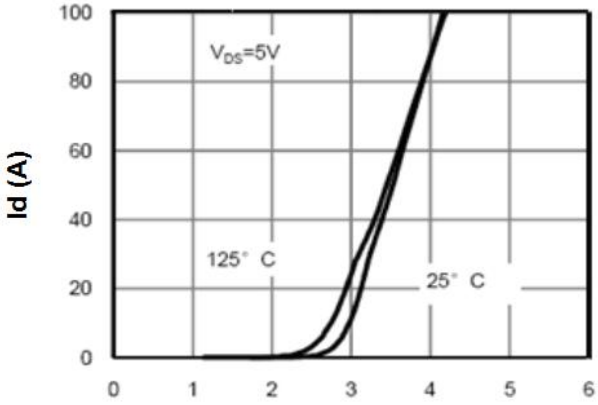
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure 1. Output Characteristics



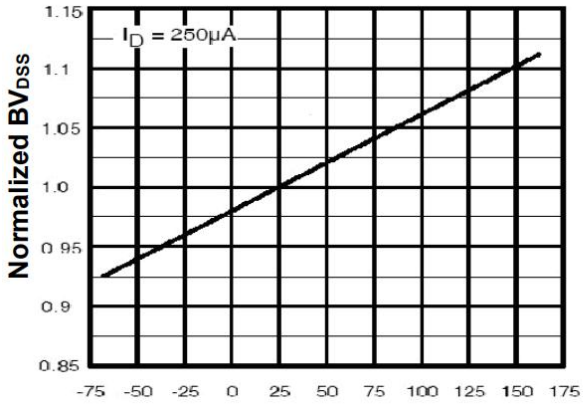
VDS Drain-to-Source Voltage(V)

Figure 2. Transfer Characteristics



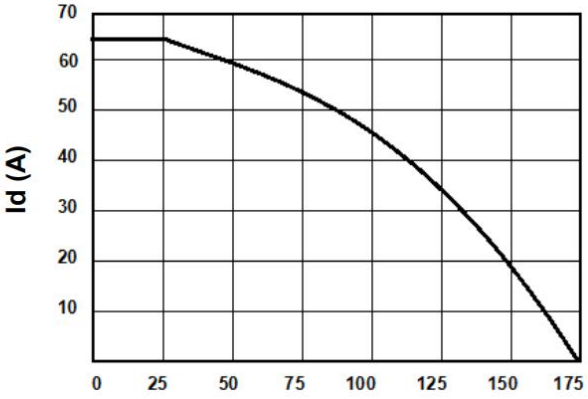
VGS Gate-to-Source Voltage(V)

Figure 3. Max BV_{DSS} vs Junction Temperature



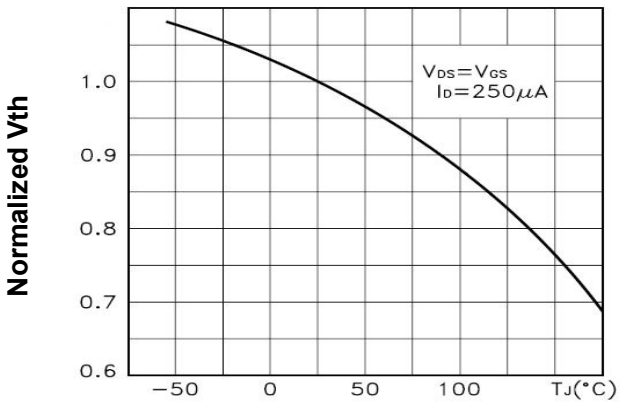
T_J-Junction Temperature(℃)

Figure 4. Drain Current



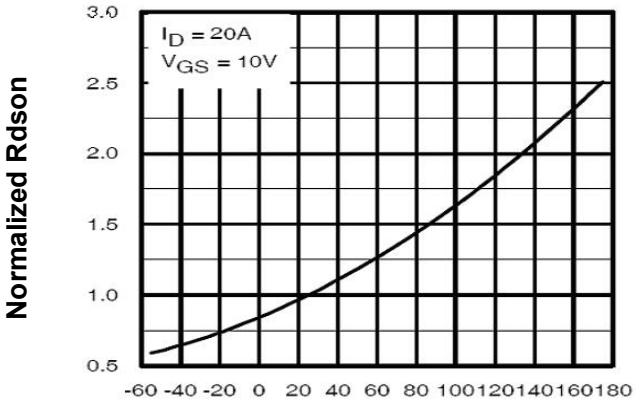
T_J-Junction Temperature(℃)

Figure 5. $V_{GS(th)}$ vs Junction Temperature



T_J-Junction Temperature(℃)

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



T_J-Junction Temperature(℃)

Figure 7. Gate Charge Waveforms

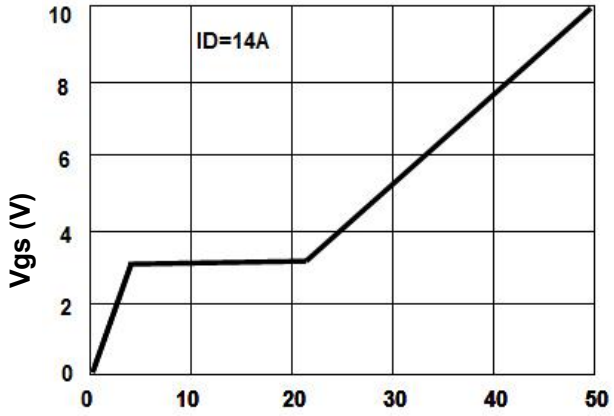


Figure 8. Capacitance

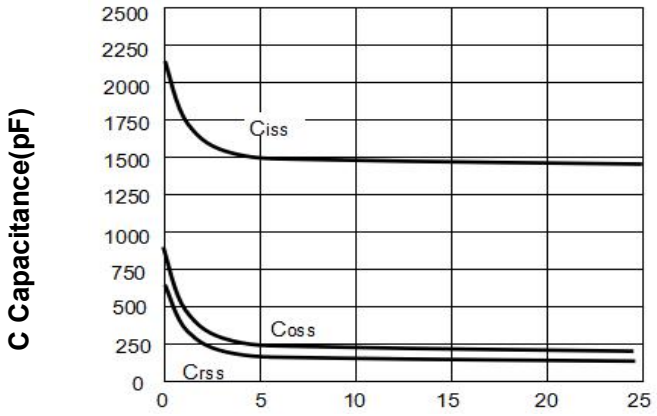


Figure 9. Body-Diode Characteristics

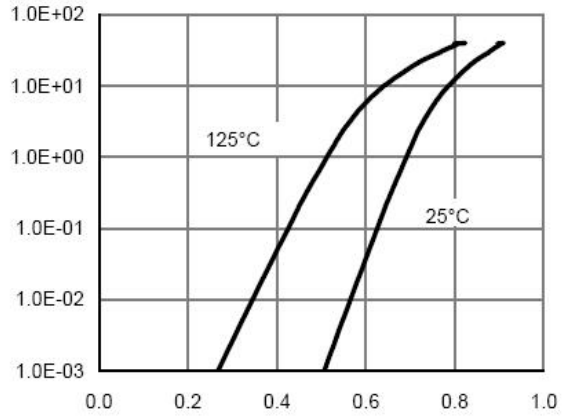


Figure 10. Maximum Safe Operating Area

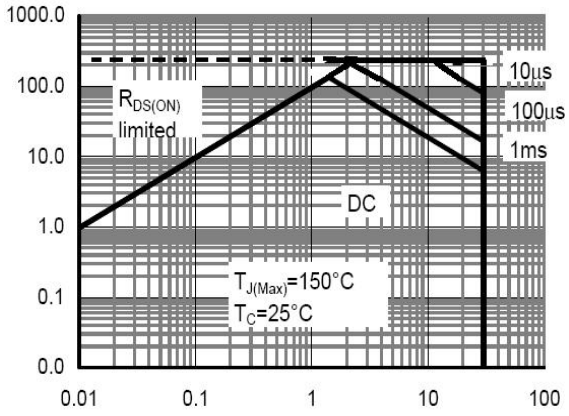
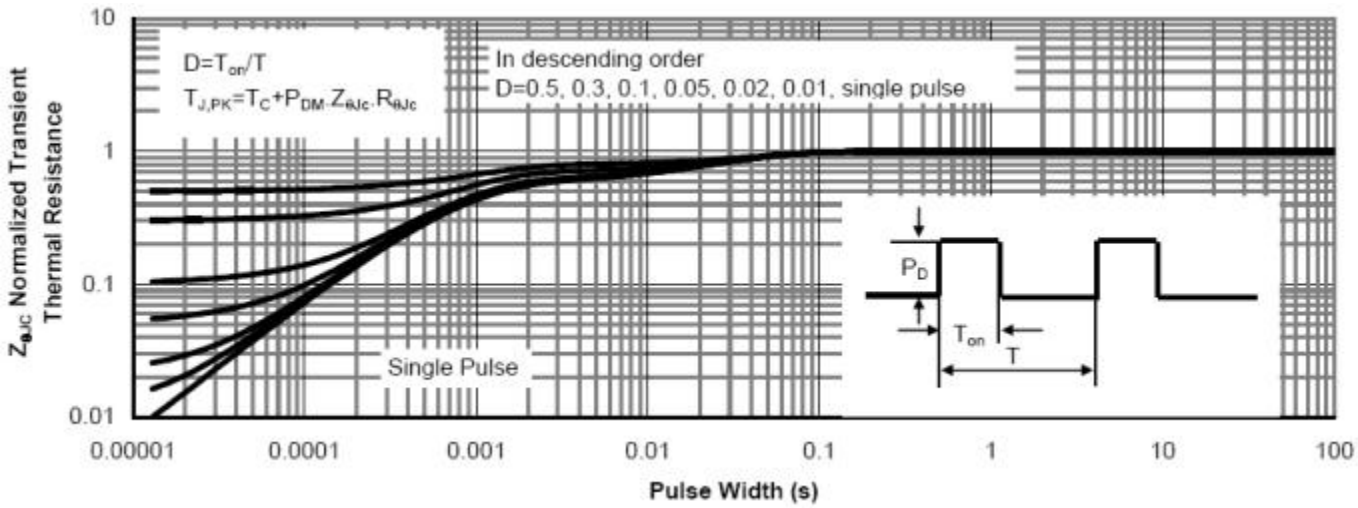
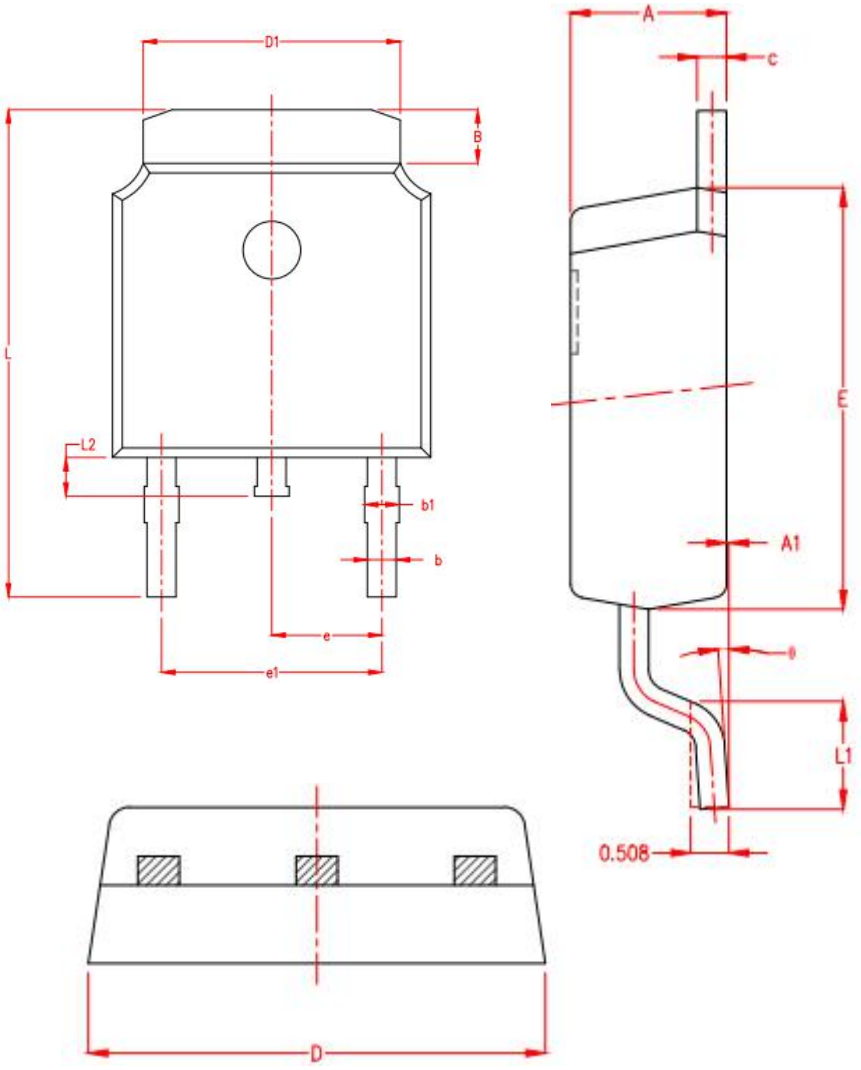


Figure 11. Normalized Maximum Transient Thermal Impedance



3060K（文件编号：S&CIC1695） **N-Channel Trench Power MOSFET**

TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.15	2.25	2.35
A1	0.00	0.06	0.12
B	0.96	1.11	1.26
b	0.59	0.69	0.79
b1	0.69	0.81	0.93
c	0.34	0.42	0.50
D	6.45	6.60	6.75
D1	5.23	5.33	5.43
E	5.95	6.10	6.25
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.90	10.10	10.30
L1	1.40	1.55	1.70
L2	0.60	0.80	1.00
θ	0°	4°	8°