3040K（文件编号：S&CIC1875） N-channel Enhancement Mode Power MOSFET

Description

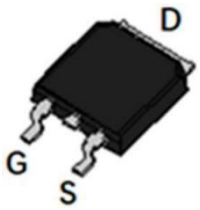
Features

- 30V, 40A
  $R_{DS(ON)}$<10mΩ @ V_{GS}=10V
  $R_{DS(ON)}$<17mΩ @ V_{GS}=4.5V
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

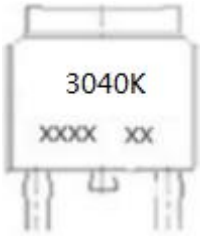
Application

- Load Switch
- PWM Application
- Power management

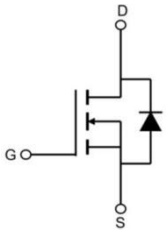
100% UIS TESTED!
100% ΔVds TESTED!



TO-252



Marking and pin Assignment



Schematic Diagram

Absolute Maximum Ratings (T_C=25℃ unless otherwise specified)

Symbol	Parameter		Max.	Units
V_{DSS}	Drain-Source Voltage		30	V
V_{GSS}	Gate-Source Voltage		±20	V
I_D	Continuous Drain Current	T_C = 25℃	40	A
		T_C = 100℃	20	A
I_{DM}	Pulsed Drain Current note1		100	A
E_{AS}	Single Pulsed Avalanche Energy note2		28	mJ
P_D	Power Dissipation	T_C = 25℃	6.2	W
$R_{\theta JC}$	Thermal Resistance, Junction to Case		20	℃/W
T_J, T_{STG}	Operating and Storage Temperature Range		-55 to +150	℃

Electrical Characteristics (T_J=25℃ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	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,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}=±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	1.5	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=20A	-	7.0	10	mΩ
		V_{GS}=4.5V, I_D=10A	-	11	17	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=15V, V_{GS}=0V, f=1.0MHz	-	900	-	pF
C_{oss}	Output Capacitance		-	140	-	pF
C_{rss}	Reverse Transfer Capacitance		-	120	-	pF
Q_g	Total Gate Charge	V_{DS}=15V, I_D=20A, V_{GS}=10V	-	19	-	nC
Q_{gs}	Gate-Source Charge		-	6.3	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	4.5	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=15V, I_D=10A, R_{GEN}=3Ω, V_{GS}=10V	-	6	-	ns
t_r	Turn-on Rise Time		-	5	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	25	-	ns
t_f	Turn-off Fall Time		-	7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	40	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	100	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=40A	-	-	1.2	V
trr	Body Diode Reverse Recovery Time	I_F=40A,dI/dt=100A/μs	-	7	-	ns
Qrr	Body Diode Reverse Recovery Charge		-	6.3	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25℃, V_{GS}=10V, R_G=25Ω， L=0.5mH

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

Figure1: Output Characteristics

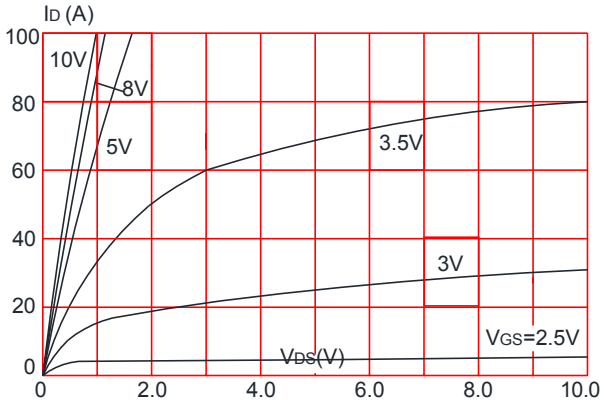


Figure 2: Typical Transfer Characteristics

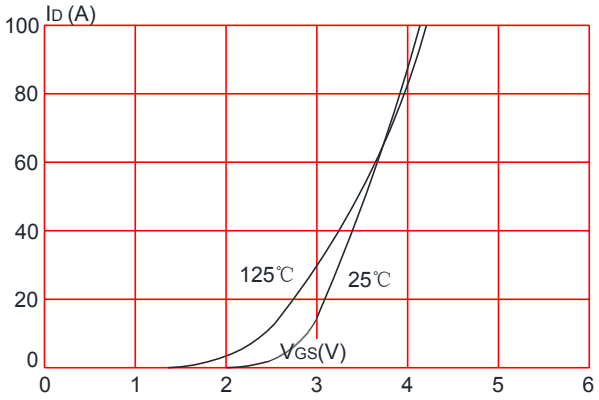


Figure 3: On-resistance vs. Drain Current

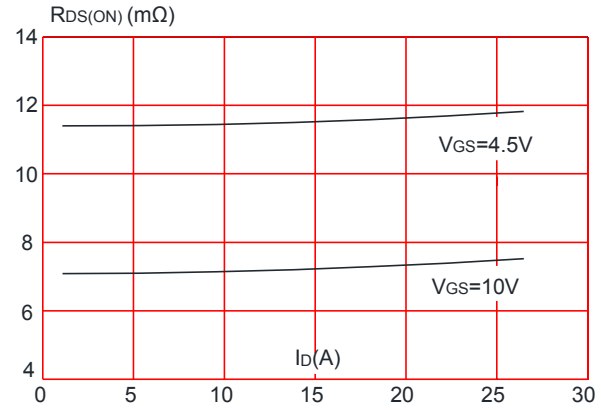


Figure 4: Body Diode Characteristics

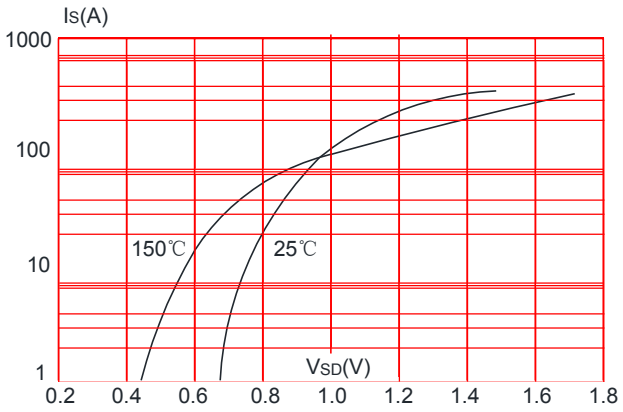


Figure 5: Gate Charge Characteristics

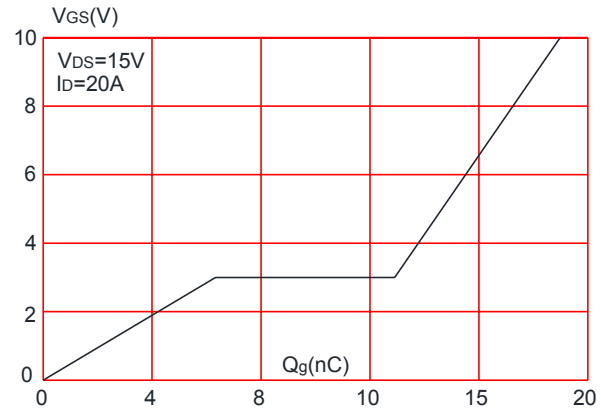


Figure 6: Capacitance Characteristics

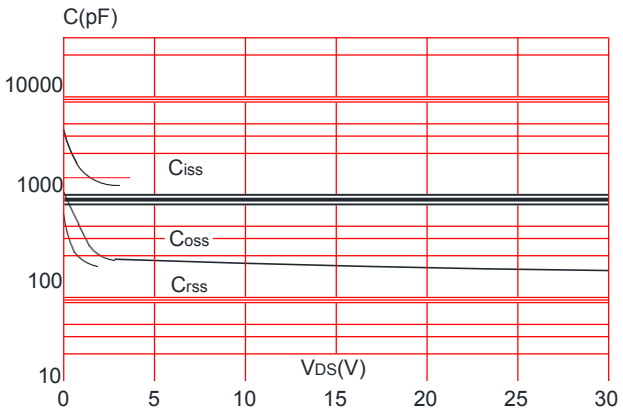


Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

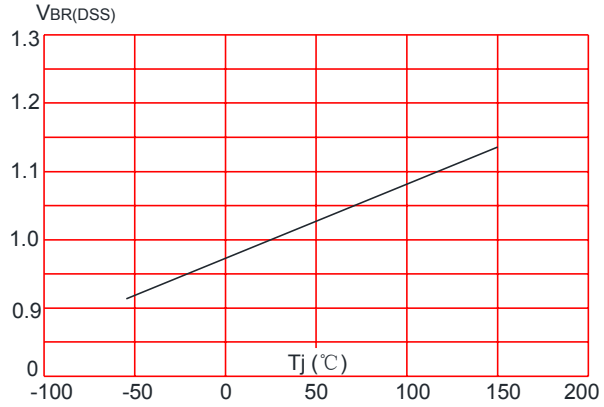


Figure 8: Normalized on Resistance vs. Junction Temperature

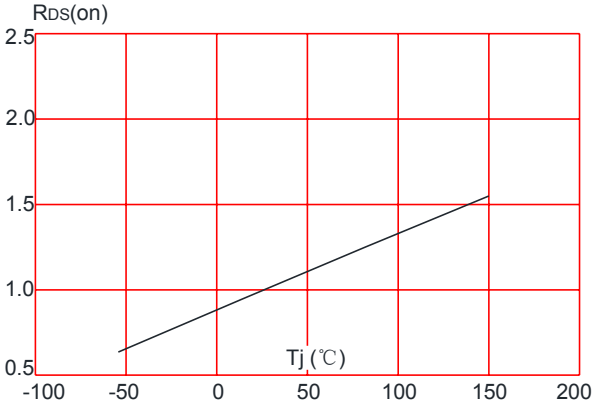


Figure 9: Maximum Safe Operating Area

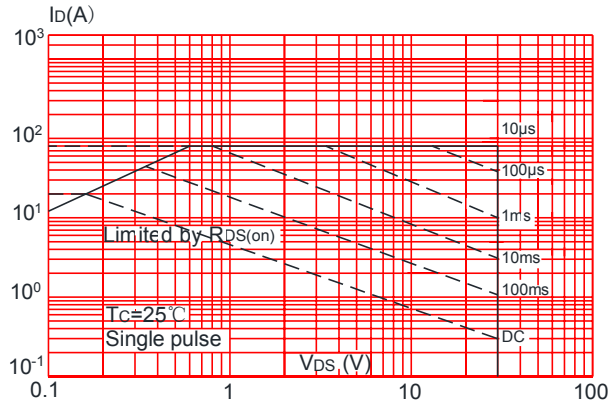


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

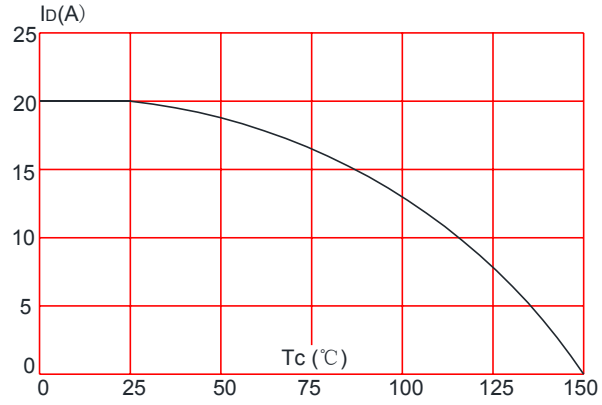
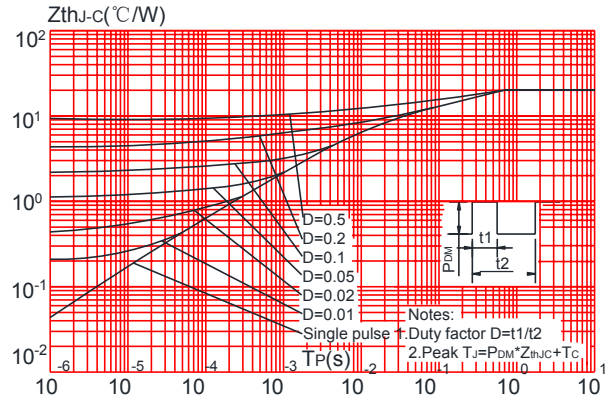


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Test Circuit

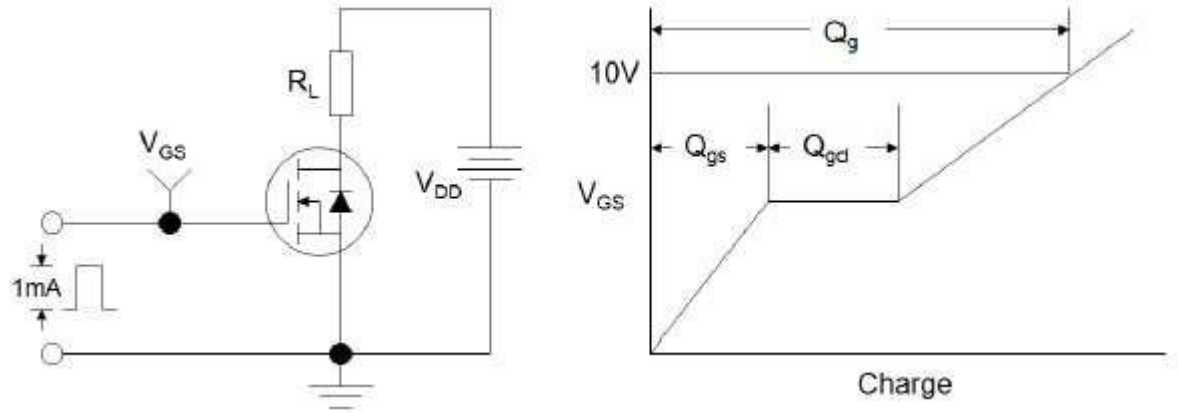


Figure1:Gate Charge Test Circuit & Waveform

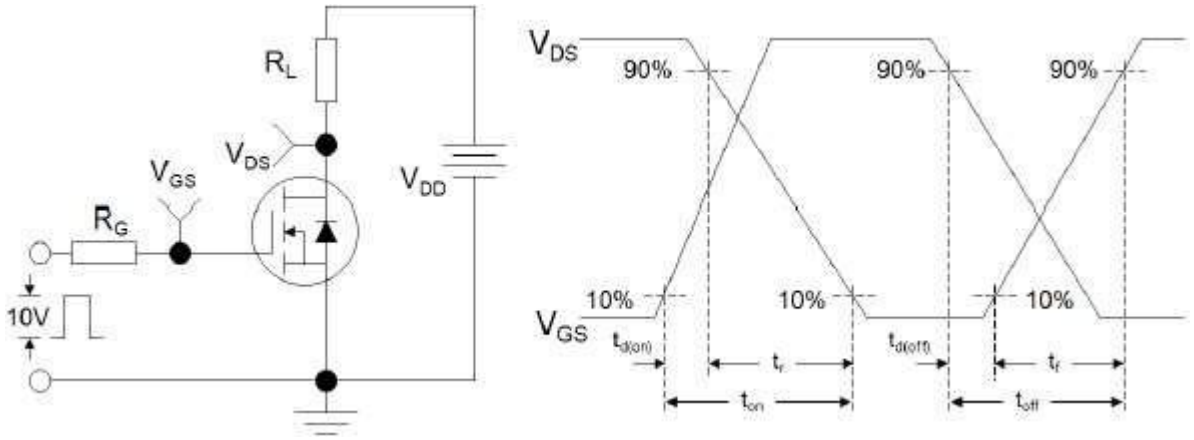


Figure 2: Resistive Switching Test Circuit & Waveforms

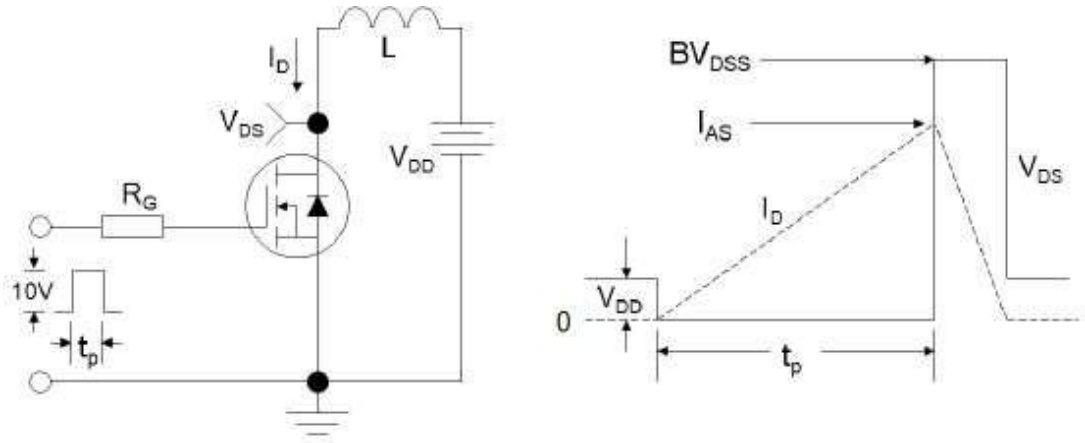
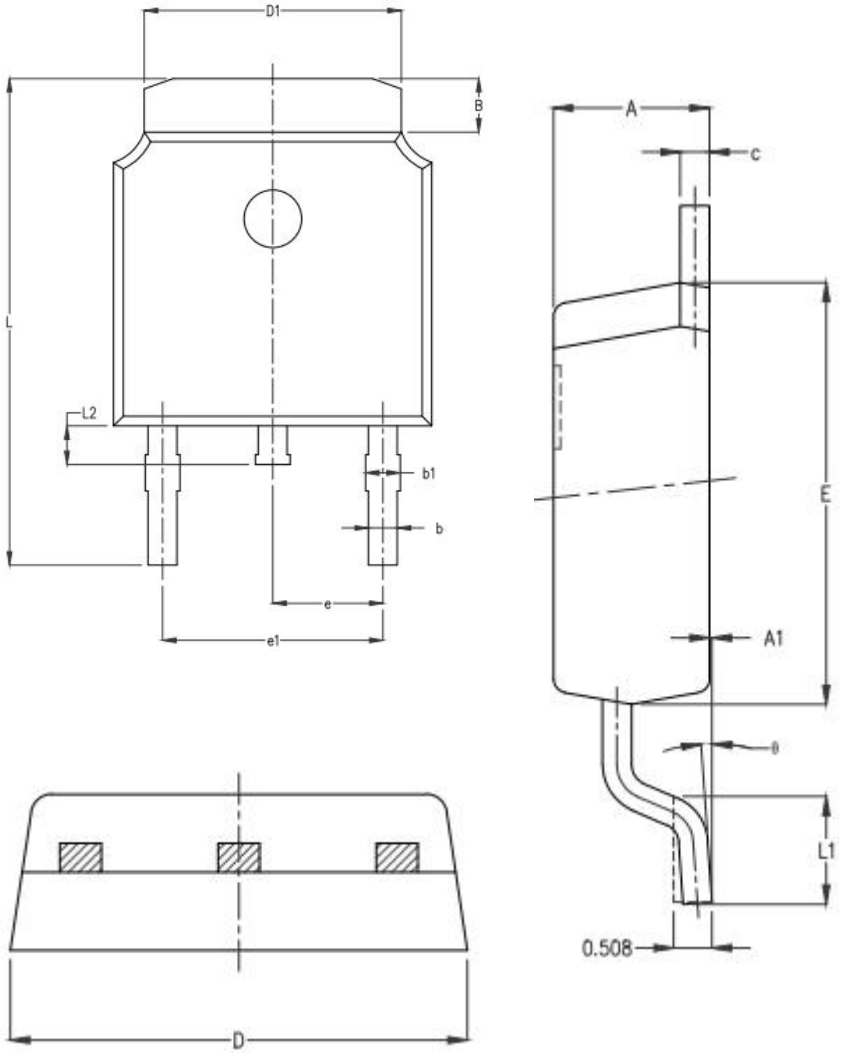


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms

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°