● General Description

The K50N06 combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.This device is ideal for load switch and battery protection applications.

● Features

Advance high cell density Trench technology

Low $R_{DS(ON)}$ to minimize conductive loss

Low Gate Charge for fast switching

Low Thermal resistance

●Application

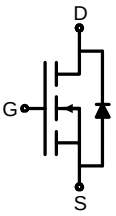
MB/VGA Vcore

SMPS 2nd Synchronous Rectifier

POL application

BLDC Motor driver

● Product Summary



V_{DS} =60V I_D=50A

$R_{DSON(10\ V\ typ)}$ =14mΩ

$R_{DSON(4.5V\ typ)}$ =18mΩ

RoHS compliant

TO-252

●Absolute Maximum Ratings (T_C =25℃)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	20	V
Continuous Drain Current	$I_{D@}$TC=25℃	50	A
	$I_{D@}$TC=75℃	35	A
	$I_{D@}$TC=100℃	30	A
Pulsed Drain Current ①	I_{DM}	104	A
Total Power Dissipation(TC=25℃)	P_D@TC=25℃	70	W
Total Power Dissipation(TA=25℃)	P_D@TA=25℃	2.8	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Avalanche Current	I_{AS} I_{AR}	40	A

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	2.8	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	55	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	°C

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V, I_D =250uA	60			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	1.0	1.5	2.2	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=60V, V_{GS} =0V			1.0	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS} =0V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=20A		14	21	mΩ
		V_{GS}=4.5V, I_D=15A		18	25	mΩ
Forward Transconductance	g_{FS}	V_{DS} =25V, I_D=10A		20		S
Source-drain voltage	V_{SD}	Is=20A			1.20	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	V_{DS} =25V V_{GS} = 0V f = 1MHz	-	1000	-	pF
Output capacitance	C_{oss}		-	108.5	-	
Reverse transfer capacitance	C_{rss}		-	96.9	-	

●Gate Charge characteristics(Ta= 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{DD} =25V I_D = 10A V_{GS} = 10V	-	15	-	nC
Gate - Source charge	Q_{gs}		-	4.5	-	
Gate - Drain charge	Q_{gd}		-	7.5	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

Fig.1 Power Dissipation

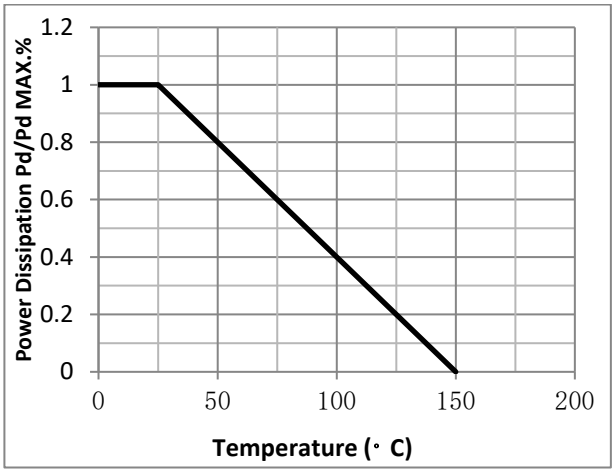


Fig.2 Typical output Characteristics

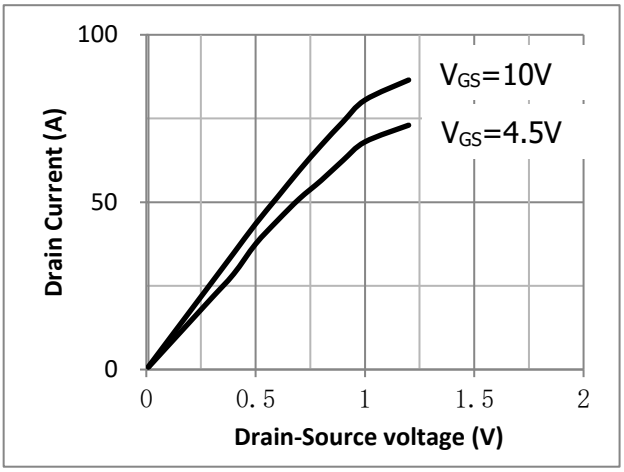


Fig.3 Threshold Voltage V.S Junction Temperature

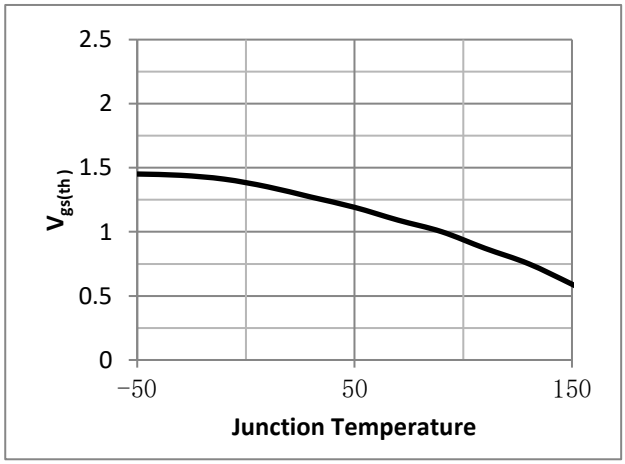


Fig.4 Resistance V.S Drain Current

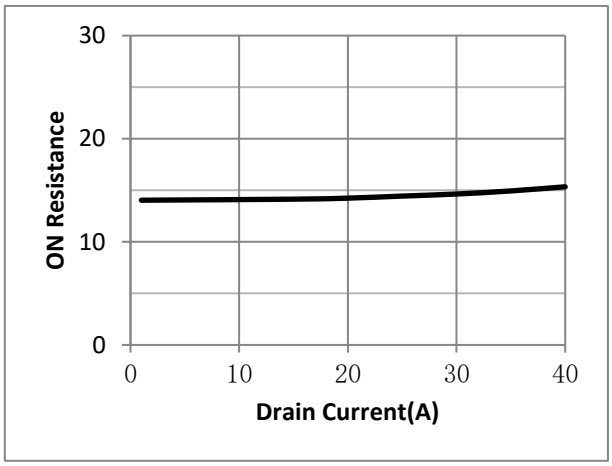


Fig.5 On-Resistance VS Gate Source Voltage

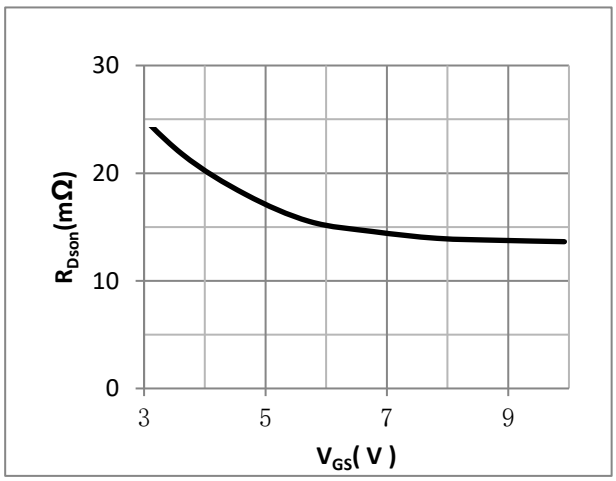


Fig.6 On-Resistance V.S Junction Temperature

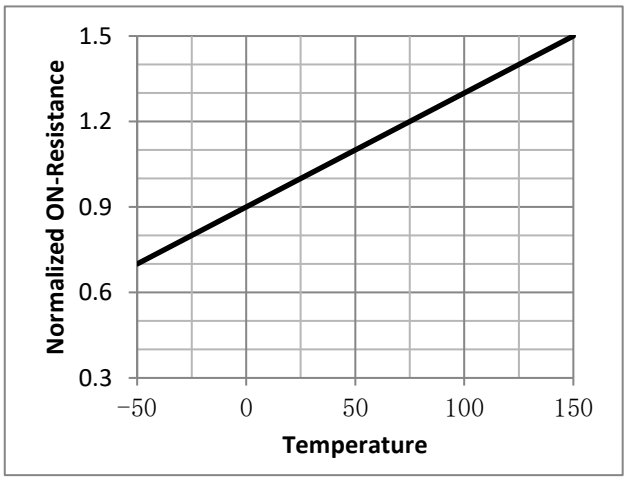


Fig.7 Switching Time Measurement Circuit

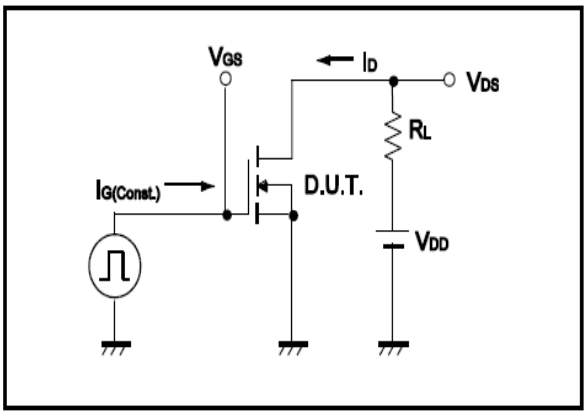


Fig.8 Gate Charge Waveform

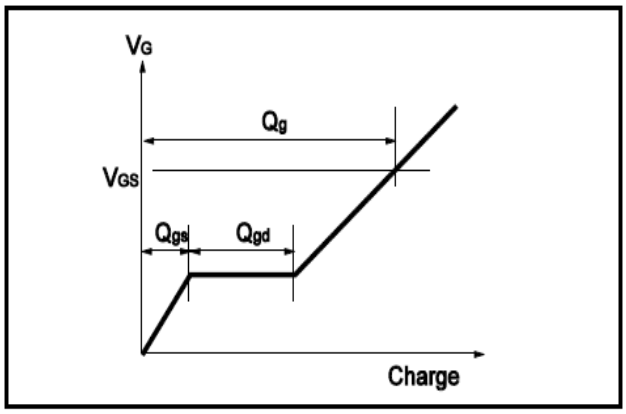


Fig.9 Switching Time Measurement Circuit

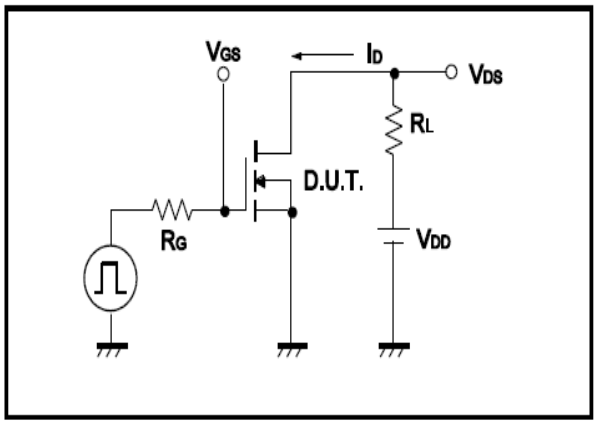


Fig.10 Gate Charge Waveform

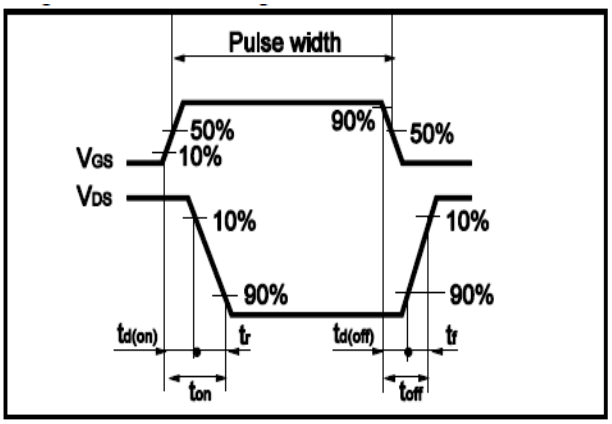


Fig.11 Avalanche Measurement Circuit

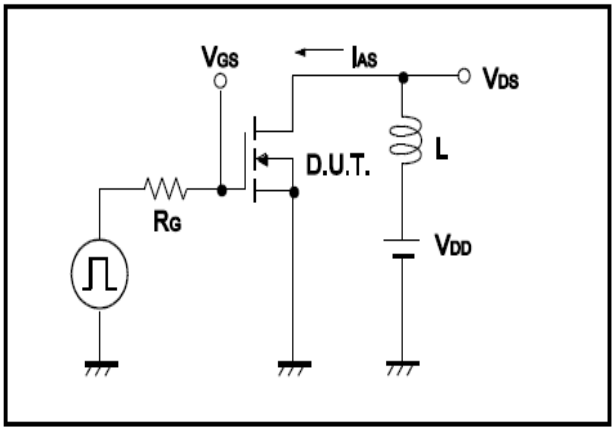
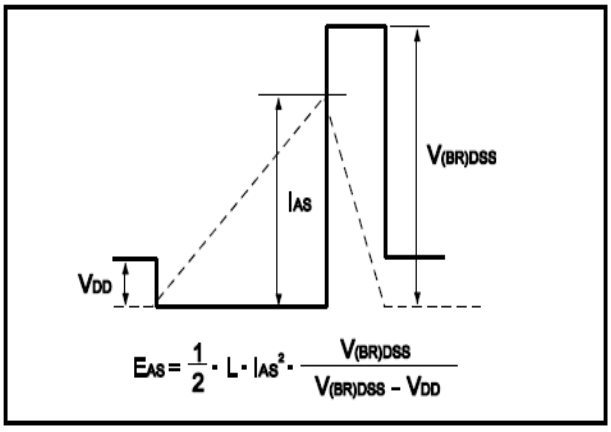
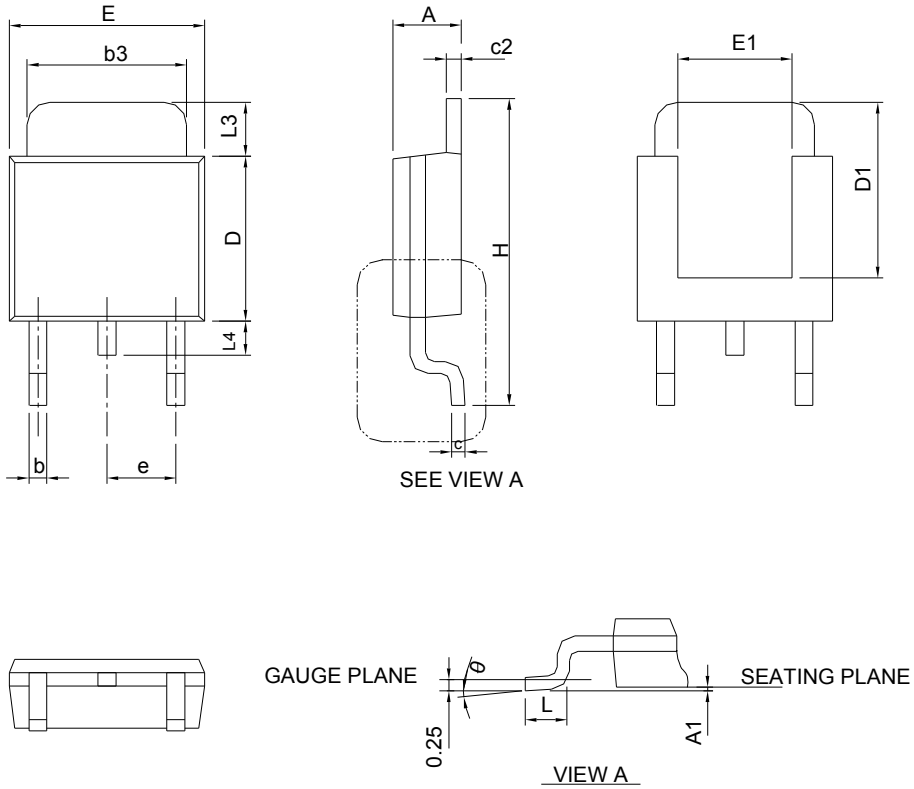


Fig.12 Avalanche Waveform



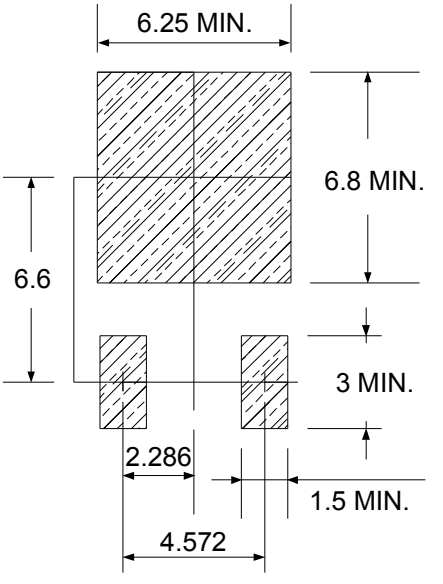
Package Information

TO-252



SYMBOL	TO-252			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	0.086	0.094
A1		0.13		0.005
b	0.50	0.89	0.020	0.035
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c2	0.46	0.89	0.018	0.035
D	5.33	6.22	0.210	0.245
D1	4.57	6.00	0.180	0.236
E	6.35	6.73	0.250	0.265
E1	3.81	6.00	0.150	0.236
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	0.90	1.78	0.035	0.070
L3	0.89	2.03	0.035	0.080
L4		1.02		0.040
θ	0°	8°	0°	8°

RECOMMENDED LAND PATTERN



UNIT: mm