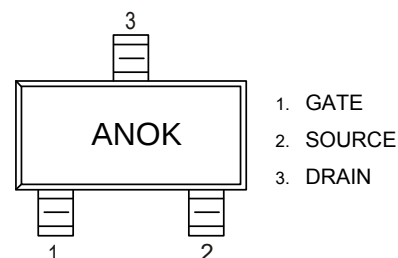


Features

- ◆ 20V, 6.5A, $R_{DS(ON)}=13m\Omega@V_{GS}=4.5V$
Improved dv/dt capability
- ◆ Fast switching
- ◆ Green Device Available

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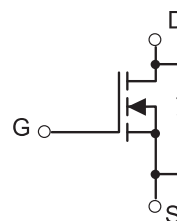
RoHS
COMPLIANT



Applications

- ◆ Notebook
- ◆ Load Switch
- ◆ Hand-Held Instruments

Equivalent Circuit



Absolute Maximum Ratings $T_c=25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	20	V
V_{GS}	Gate-Source Voltage	± 12	V
I_D	Drain Current – Continuous ($T_c=25^\circ\text{C}$)	6.5	A
	Drain Current – Continuous ($T_c=100^\circ\text{C}$)	5.0	A
I_{DM}	Drain Current – Pulsed ¹	26.8	A
P_D	Power Dissipation ($T_c=25^\circ\text{C}$)	1.56	W
	Power Dissipation – Derate above 25°C	0.012	W/ $^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$
T_J	Operating Junction Temperature Range	-55 to 125	$^\circ\text{C}$

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to ambient	---	80	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V$, $I_D=250\mu A$	20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=1mA$	---	0.02	---	V/ $^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=20V$, $V_{GS}=0V$, $T_J=25^\circ\text{C}$	---	---	1	μA
		$V_{DS}=16V$, $V_{GS}=0V$, $T_J=125^\circ\text{C}$	---	---	10	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V$, $V_{DS}=0V$	---	---	± 100	nA

On Characteristics

$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=4.5V$, $I_D=6A$	---	13	18	m Ω
		$V_{GS}=2.5V$, $I_D=5A$	---	14	20	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}$, $I_D=250\mu A$	0.3	0.6	1.0	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	2	---	mV/ $^\circ\text{C}$
g_{fs}	Forward Transconductance	$V_{DS}=10V$, $I_S=4A$	---	9.5	---	S

Dynamic and switching Characteristics

Q_g	Total Gate Charge ^{2,3}	$V_{DS}=10V$, $V_{GS}=4.5V$, $I_D=4A$	---	5.8	---	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	0.6	---	
Q_{gd}	Gate-Drain Charge ^{2,3}		---	2	---	
$T_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=10V$, $V_{GS}=4.5V$, $R_G=25\Omega$ $I_D=1A$	---	5.0	---	nS
T_r	Rise Time ^{2,3}		---	14.4	---	
$T_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	30.0	---	
T_f	Fall Time ^{2,3}		---	9.2	---	
C_{iss}	Input Capacitance	$V_{DS}=10V$, $V_{GS}=0V$, $F=1MHz$	---	518	---	pF
C_{oss}	Output Capacitance		---	88	---	
C_{rss}	Reverse Transfer Capacitance		---	68	---	

Drain-Source Diode Characteristics and Maximum Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current	$V_G=V_D=0V$, Force Current	---	---	6.5	A
I_{SM}	Pulsed Source Current		---	---	14	A
V_{SD}	Diode Forward Voltage	$V_{GS}=0V$, $I_S=1A$, $T_J=25^\circ\text{C}$	---	---	1.2	V

Note :

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
3. Essentially independent of operating temperature.

Typical Characteristics

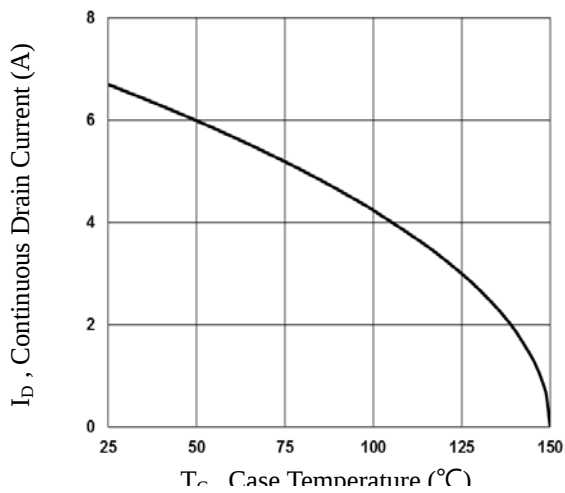


Fig.1 Continuous Drain Current vs. T_C

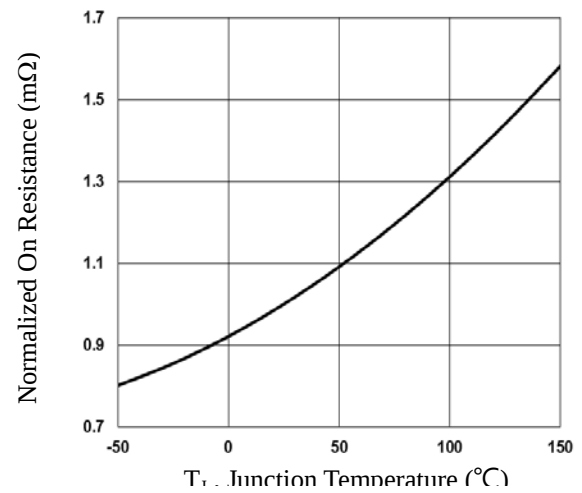


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

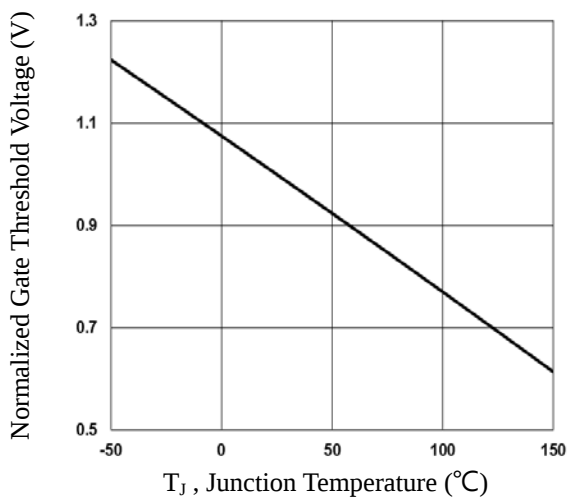


Fig.3 Normalized V_{th} vs. T_J

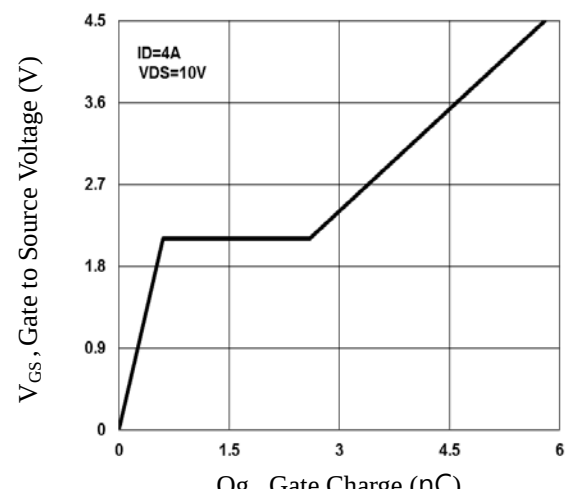


Fig.4 Gate Charge Waveform

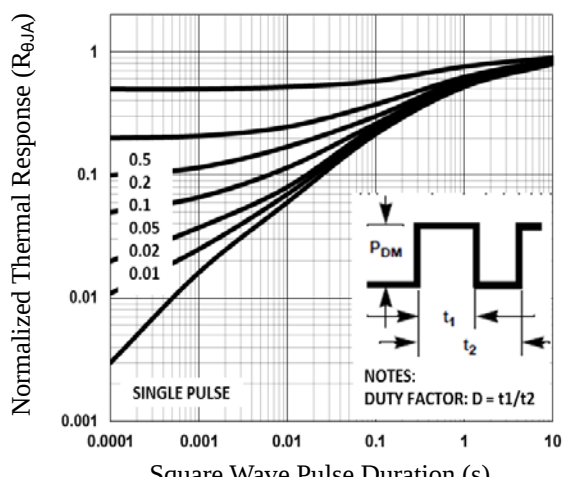


Fig.5 Normalized Transient Impedance

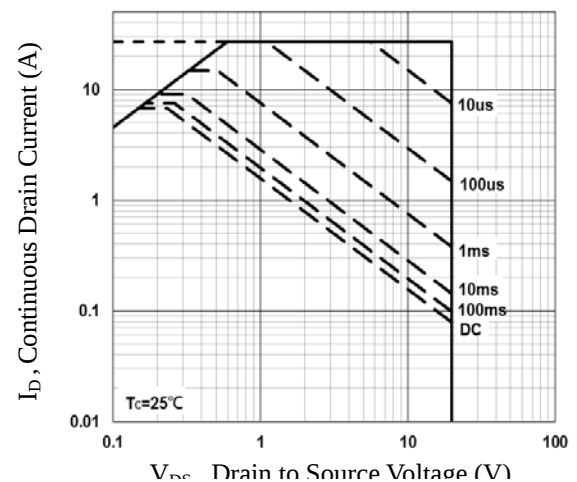


Fig.6 Maximum Safe Operation Area

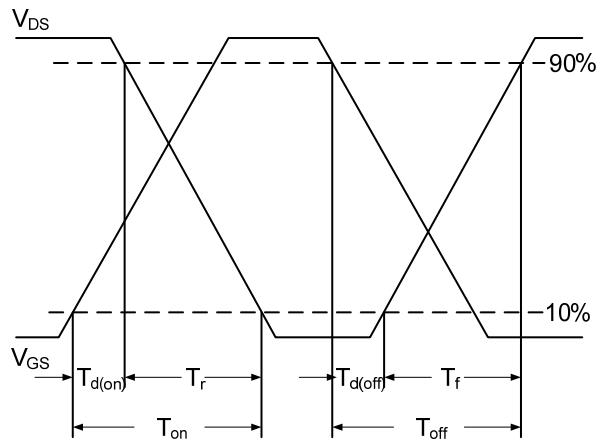


Fig.7 Switching Time Waveform

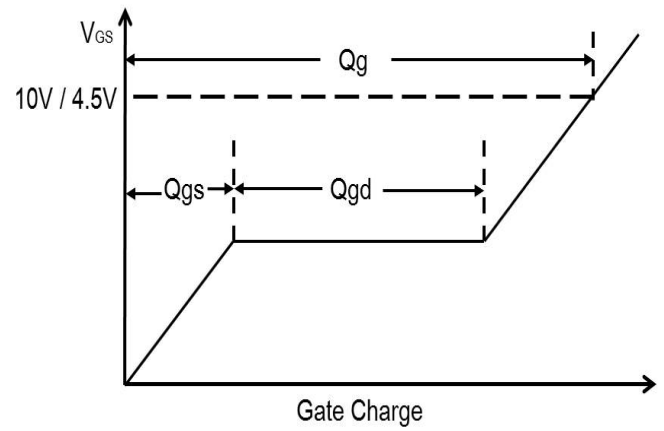
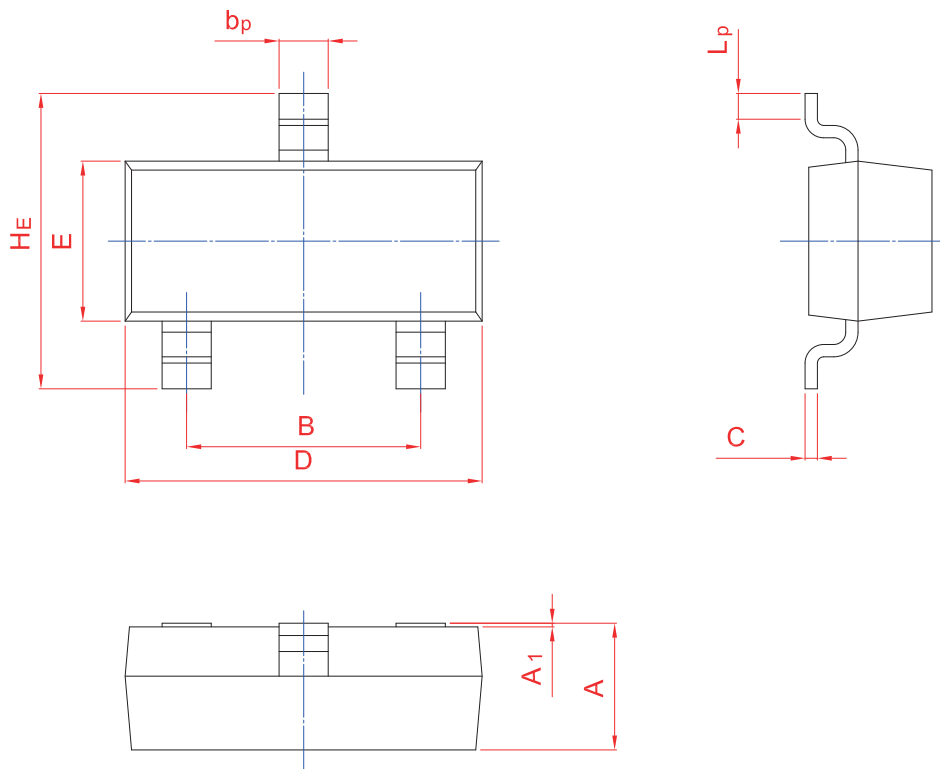
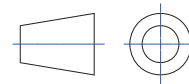


Fig.8 Gate Charge Waveform

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

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UNIT	A	B	bp	C	D	E	HE	A1	Lp
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20