

**SE9435**  
**P-Channel Enhancement Mode Power MOSFET**

**General Description**

The MOSFETs from SINO-IC provide the best combination of fast switching, low on-resistance and cost-effectiveness.

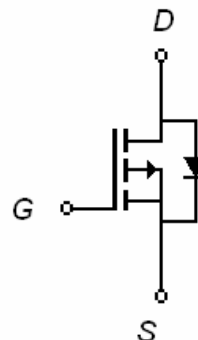
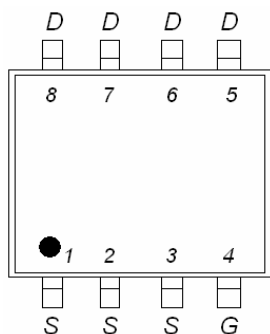
**Applications**

- Power management in nomadic equipment
- DC-DC converters
- Battery powered systems
- Motor drive

**Features**

- $V_{DS} = -30\text{ V}$
- $I_D = -5.3\text{ A}$
- $R_{DS(ON)} = 0.050\ \Omega @ V_{GS} = -10\text{V}$
- Low gate charge.
- Fast switching speed.
- Extremely low  $R_{DS(ON)}$
- High power and current handling capability

**SOP-8**



**Absolute Maximum Ratings**

Parameter	Symbol	Rating	Units
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>3</sup> @ $T_A=25^\circ\text{C}$	$I_D$	-5.3	A
Continuous Drain Current <sup>3</sup> @ $T_A=70^\circ\text{C}$	$I_D$	-4.7	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	-20	A
Power Dissipation @ $T_A=25^\circ\text{C}$	$P_D$	2.5	W
Linear Dearing Factor		0.02	W/ $^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	-55 to 150	$^\circ\text{C}$
Operating Junction Temperature Range	$T_J$	-55 to 150	$^\circ\text{C}$

**Thermal Characteristics**

Parameter	Symbol	Max	Units
Thermal Resistance Junction-to-Ambient <sup>3</sup>	$R_{thj-amb}$	50	$^\circ\text{C}/\text{W}$

Electrical Characteristics (T <sub>J</sub> =25°C unless otherwise noted)						
Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
<b>STATIC PARAMETERS</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	I <sub>D</sub> = -250 μA, V <sub>GS</sub> =0 V	-30			V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> = -30 V, V <sub>GS</sub> =0 V			-1	μA
		V <sub>DS</sub> = -24 V, V <sub>GS</sub> =0 V (T <sub>J</sub> =70°C)			-25	μA
I <sub>GSS</sub>	Gate-Body leakage current	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> I <sub>D</sub> = -250 μA	-1		-3	V
R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance <sup>2</sup>	V <sub>GS</sub> = -10 V, I <sub>D</sub> = -5.3 A			50	mΩ
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -4.2A			90	mΩ
g <sub>FS</sub>	Forward Transconductance	V <sub>DS</sub> = -10V, I <sub>D</sub> = -5.3 A		10		S
V <sub>SD</sub>	Diode Forward Voltage	I <sub>S</sub> = -2.6 A, V <sub>GS</sub> = 0 V			-1.2	V
I <sub>S</sub>	Body-Diode Continuous Current	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =-1.2 V			-2.08	A
<b>DYNAMIC PARAMETERS</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0V, V <sub>DS</sub> = -15 V, f=1MHz		790		pF
C <sub>oss</sub>	Output Capacitance			440		pF
C <sub>rss</sub>	Reverse Transfer Capacitance			120		pF
<b>SWITCHING PARAMETERS</b>						
Q <sub>g</sub>	Total Gate Charge <sup>2</sup>	V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V, I <sub>D</sub> = -5.3A		20		nC
Q <sub>gs</sub>	Gate Source Charge			3.5		nC
Q <sub>gd</sub>	Gate Drain Charge			2		nC
t <sub>d(on)</sub>	Turn-On DelayTime <sup>2</sup>	V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V, I <sub>D</sub> = -1A R <sub>D</sub> =15Ω, R <sub>G</sub> =6Ω		12		ns
t <sub>r</sub>	Turn-On Rise Time			20		ns
t <sub>d(off)</sub>	Turn-Off DelayTime			45		ns
t <sub>f</sub>	Turn-Off Fall Time			47		ns

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pluse width ≤ 300us, duty cycle ≤ 2%.
3. Surface mounded on 1 in<sup>2</sup> copper pad of FR4 board; 125°C/W when mounted on Min. copper pad

Typical Characteristics

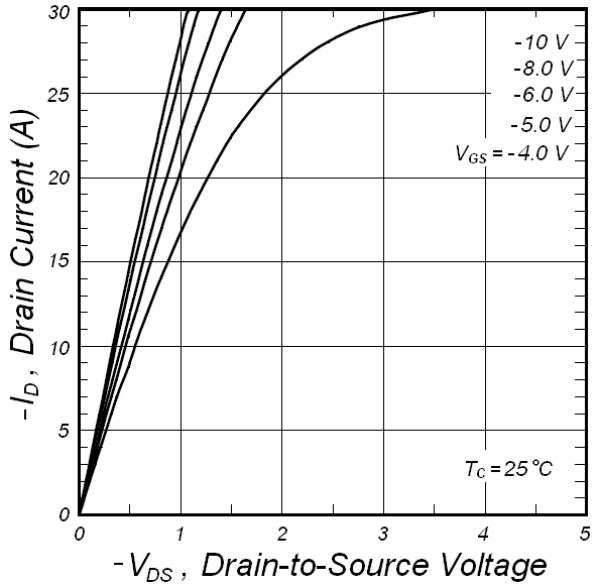


Fig1. Typical output characteristics

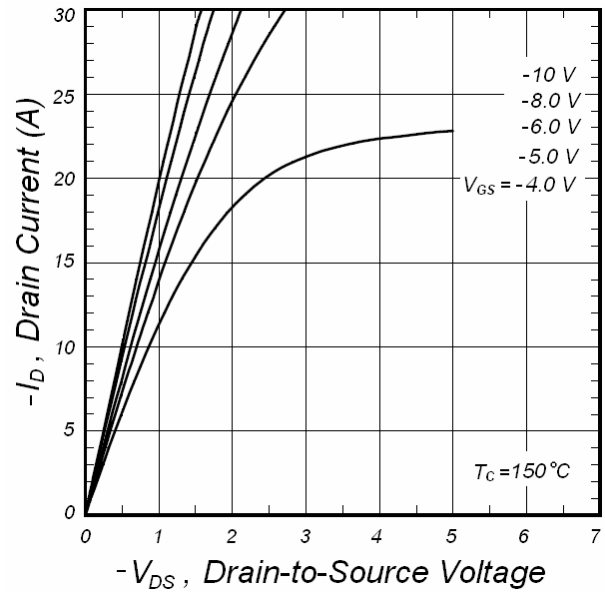


Fig2. Typical output characteristics

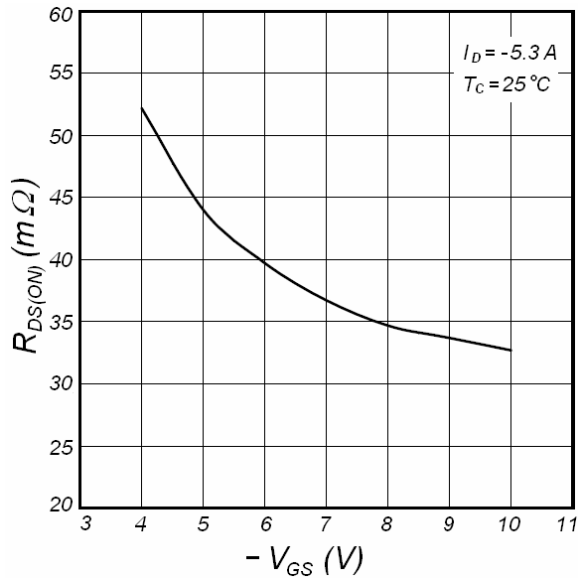


Fig3. On-Resistance v.s. Gate Voltage

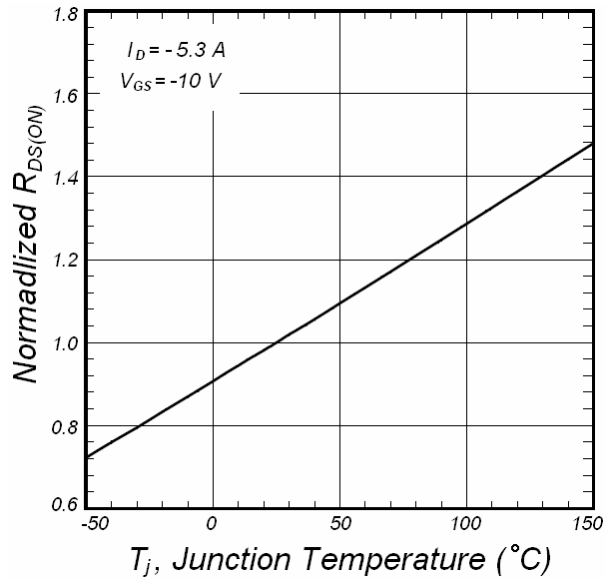


Fig4. Normalized On-Resistance v.s. Junction Temperature

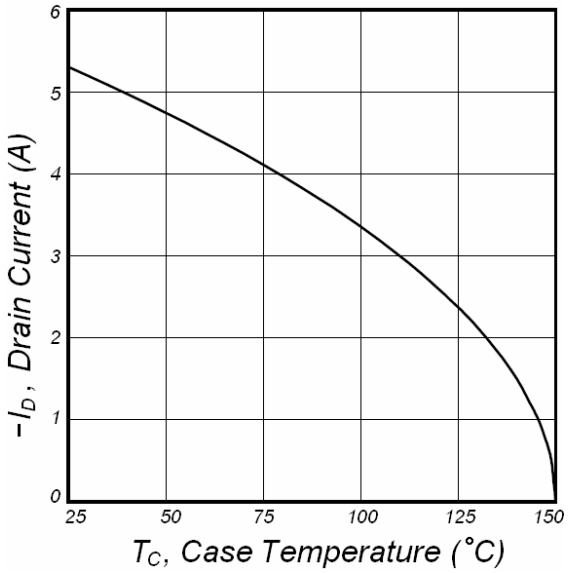


Fig5. Maximum Drain Current v.s. Case Temperature

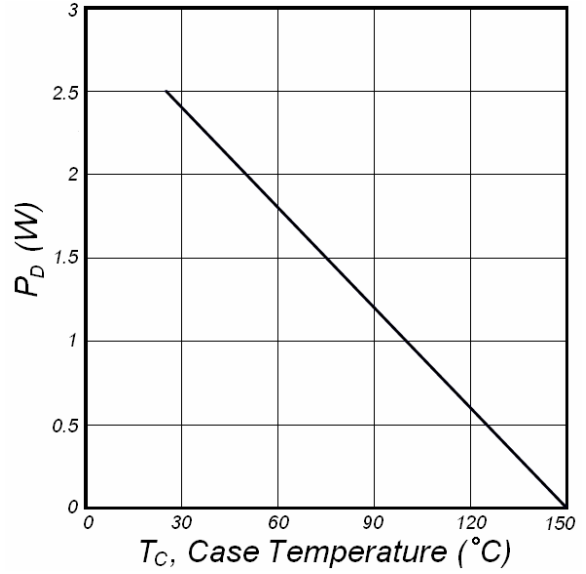


Fig6. Typical Power Dissipation

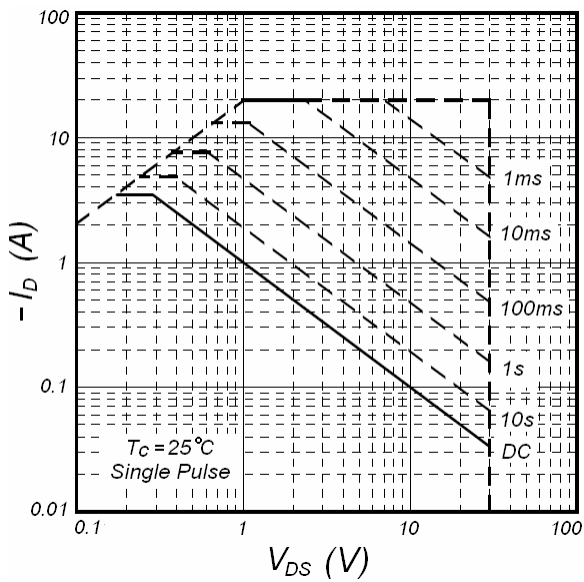


Fig7. Maximum Safe Operating Area

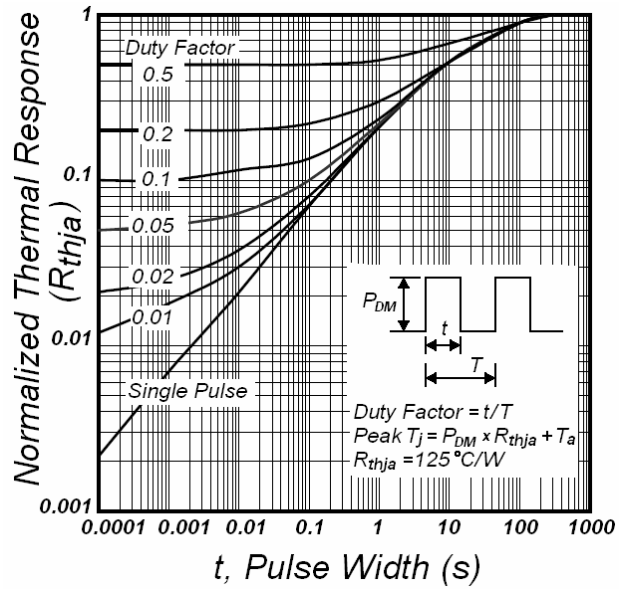


Fig8. Effective Transient Thermal Impedance

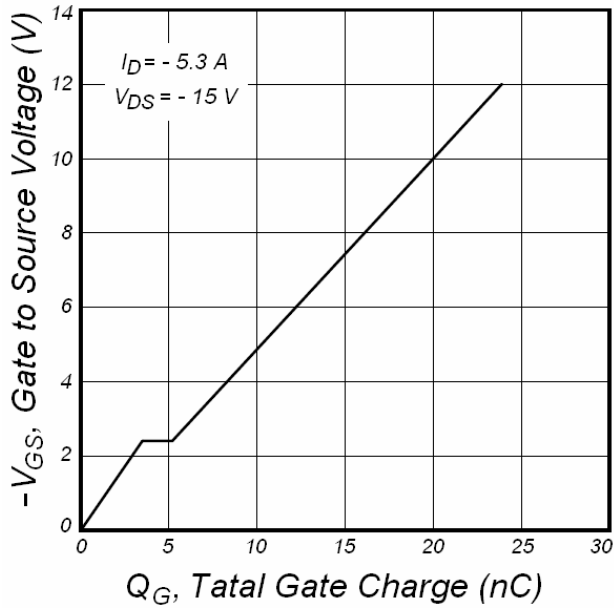


Fig9. Gate Charge Characteristics

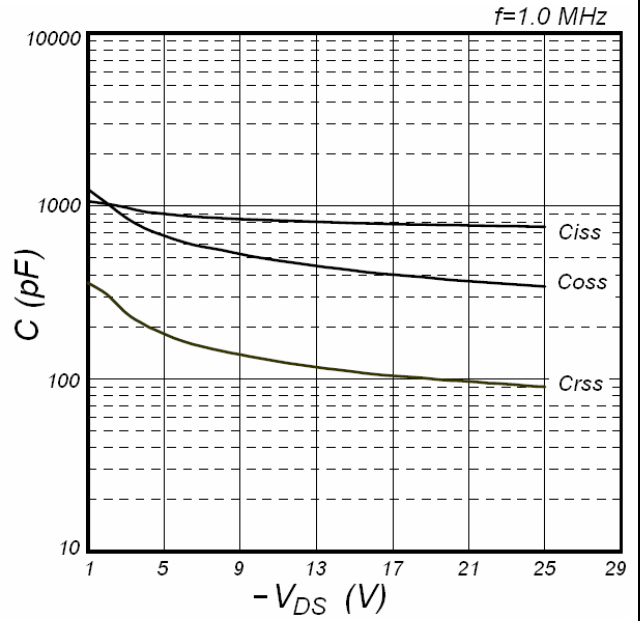


Fig10. Typical Capacitance Characteristics

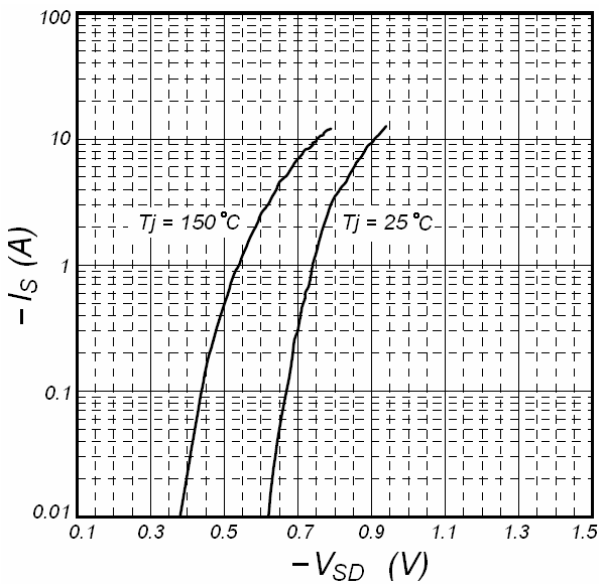


Fig11. Forward Characteristic of Reverse Diode

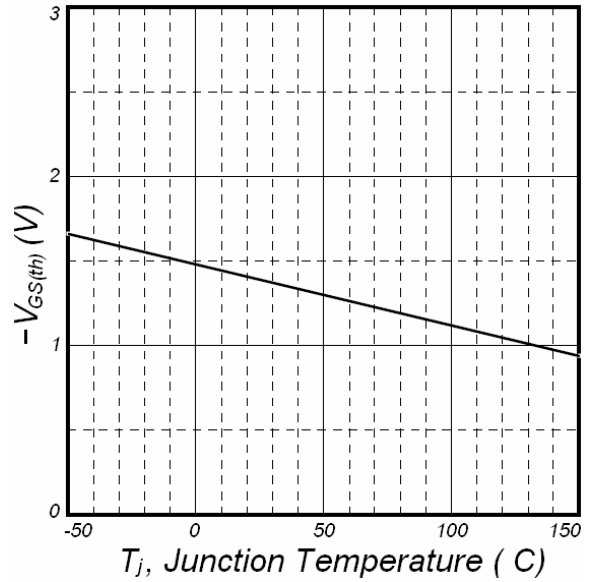


Fig12. Gate Threshold Voltage v.s. Junction Temperature

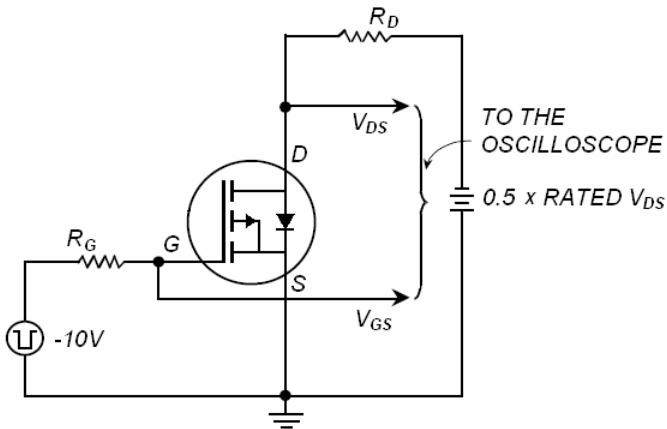


Fig13. Switching Time Circuit

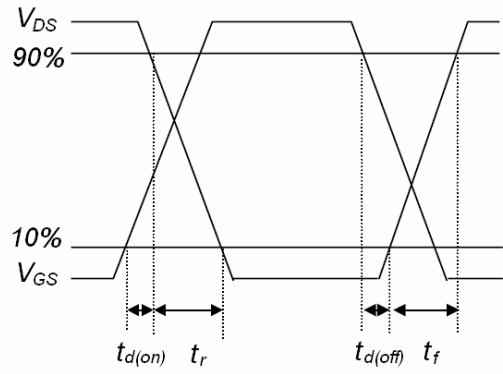


Fig14. Switching Time Waveform

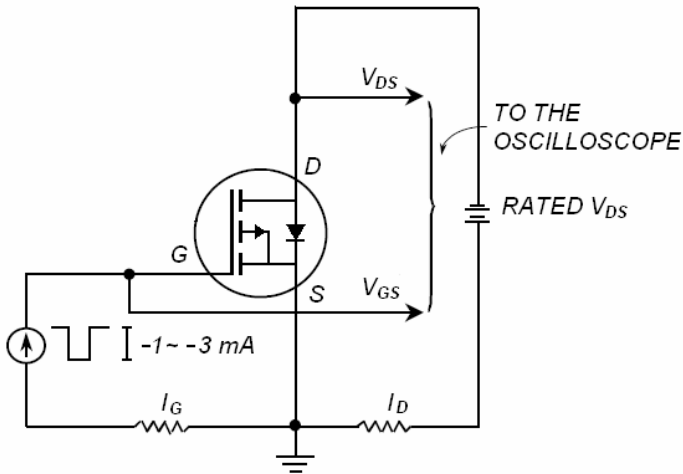


Fig15. Gate Charge Circuit

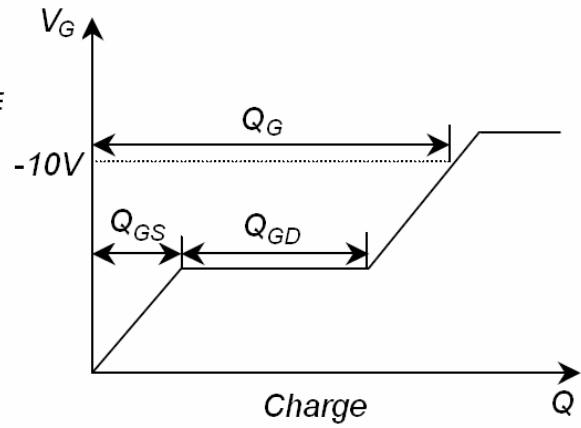
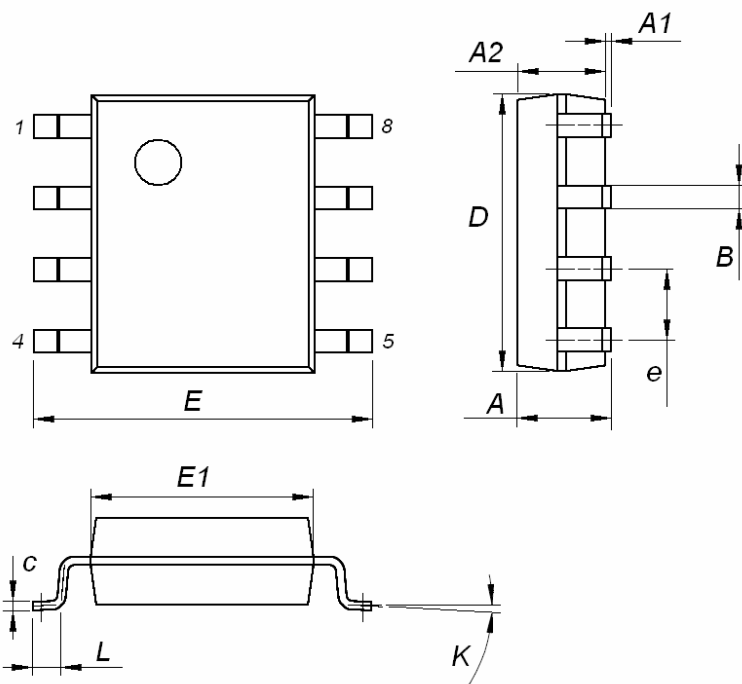


Fig16. Gate Charge Waveform

## SOP-8 MECHANICAL DATA

DIM	Millimeters		
	MIN	TYP	MAX
A			1.75
A1	0.10		0.25
A2	1.35	1.55	1.75
B	0.35	0.42	0.49
C	0.19		0.25
D	4.80	4.90	5.00
E	5.80	6.00	6.20
E1	3.80	3.95	4.00
e		1.27	
L	0.40		0.90
K	0°		8°



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