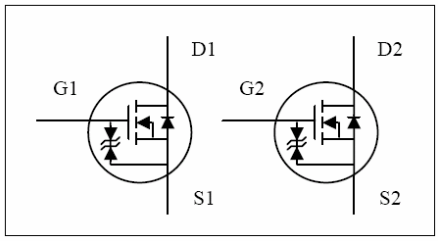
GTS9928E

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV_{DSS}	20V
$R_{DS(ON)}$	22mΩ
I_D	5A

Description

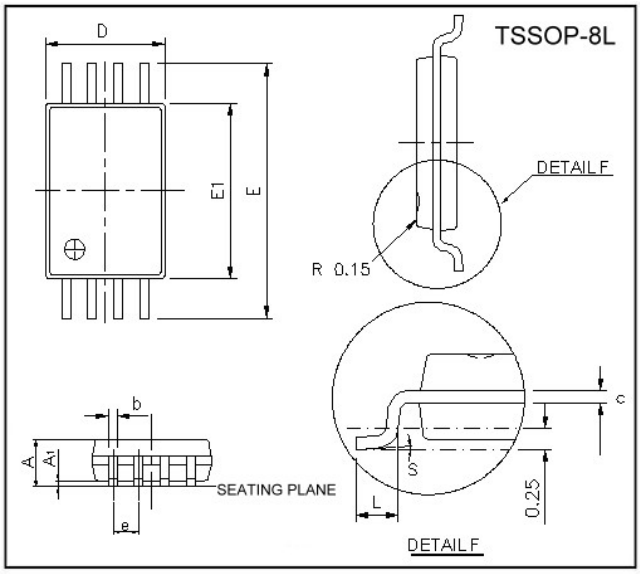
The GTS9928E provides the designer with the best combination of fast switching, ruggedized device design, ultra low on-resistance and cost-effectiveness.

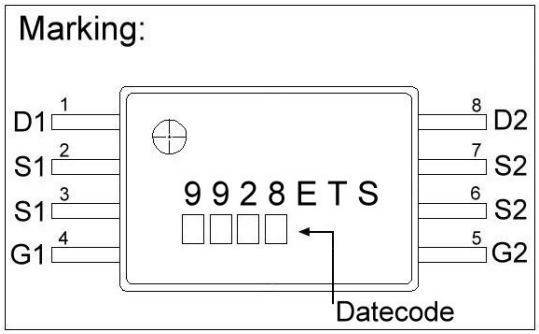


Features

*Low on-resistance
*Capable of 2.5V gate drive
*Optimal DC/DC battery application

Package Dimensions





REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	-	1.20	E	6.20	6.60
A1	0.05	0.15	E1	4.30	4.50
b	0.19	0.30	e	0.65 BSC	
c	0.09	0.20	L	0.45	0.75
D	2.90	3.10	S	0°	8°

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current[3], VGS@4.5V	I_D @Ta=25℃	5.0	A
Drain Current[3], VGS@4.5V	I_D @Ta=70℃	3.5	A
Pulsed Drain Current[1]	I_{DM}	25	A
Power Dissipation	P_D @Ta=25℃	1	W
Linear Derating Factor		0.008	W/℃
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150	℃

Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient[3] Max.	Rthj-a	125	℃/W

Electrical Characteristics(Tj = 25℃ Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250uA
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle Tj$	-	0.02	-	V/℃	Reference to 25℃, I_D=1mA
Gate Threshold Voltage	$V_{GS(th)}$	0.5	-	-	V	V_{DS}=V_{GS}, I_D=250uA
Forward Transconductance	g_{fs}	-	21	-	S	V_{DS}=10V, I_D=5A
Gate-Source Leakage Current	I_{GSS}	-	-	±10	uA	V_{GS}= ±12V
Drain-Source Leakage Current(Tj=25℃)	I_{DSS}	-	-	1	uA	V_{DS}=20V, V_{GS}=0
Drain-Source Leakage Current(Tj=70℃)		-	-	25	uA	V_{DS}=20V, V_{GS}=0
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	-	22	mΩ	V_{GS}=4.5V, I_D=5A
		-	-	28		V_{GS}=2.5V, I_D=2A,
Total Gate Charge[2]	Q_g	-	15.9	-	nC	I_D=5A V_{DS}=10V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	1.5	-		
Gate-Drain (“Miller”) Change	Q_{gd}	-	7.4	-		
Turn-on Delay Time[2]	$T_{d(on)}$	-	6.2	-	ns	V_{DS}=10V I_D=1A V_{GS}=4.5V R_G=3.3Ω R_D=10Ω
Rise Time	T_r	-	9	-		
Turn-off Delay Time	$T_{d(off)}$	-	30	-		
Fall Time	T_f	-	11	-		
Input Capacitance	C_{iss}	-	530	-	pF	V_{GS}=0V V_{DS}=20V f=1.0MHz
Output Capacitance	C_{oss}	-	245	-		
Reverse Transfer Capacitance	C_{rss}	-	125	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage[2]	V_{SD}	-	-	1.2	V	I_S=5A, V_{GS}=0, Tj=25℃
Continuous Source Current(Body Diode)	I_S	-	-	0.83	A	V_D=V_G=0V, V_S=1.2V

Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width≦300us, duty cycle≦2%.

3. Surface mounted on 1 in^2 copper pad of FR4 board; 208℃/W when mounted on Min. copper pad.

Characteristics Curve

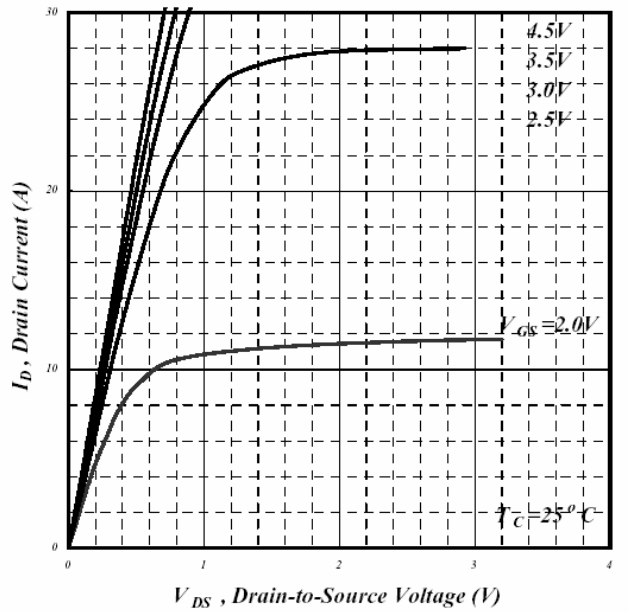


Fig 1. Typical Output Characteristics

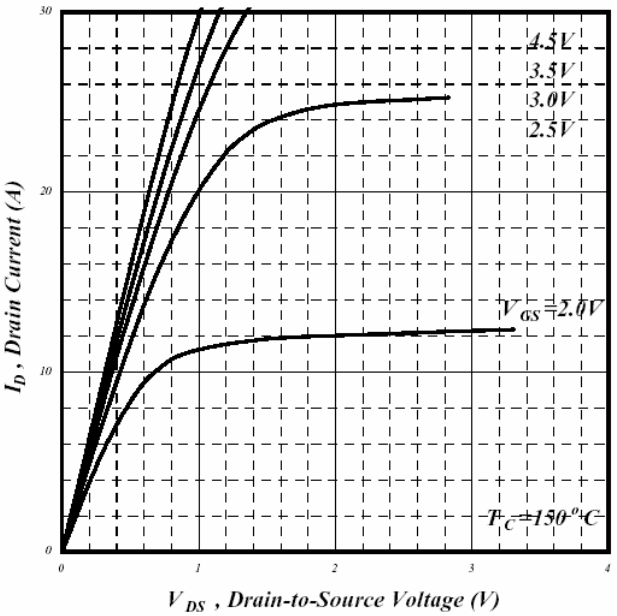


Fig 2. Typical Output Characteristics

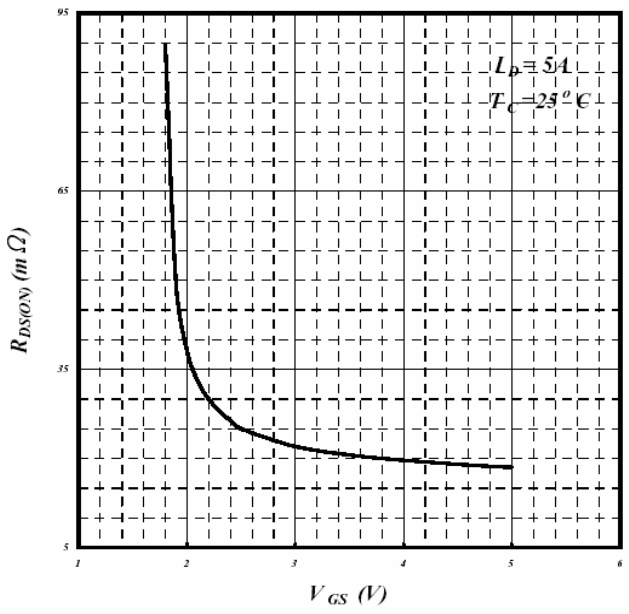


Fig 3. On-Resistance v.s. Gate Voltage

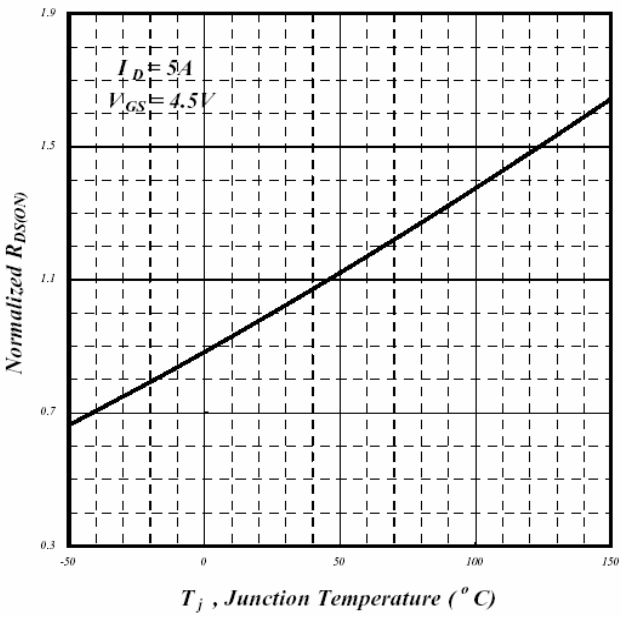


Fig 4. Normalized On-Resistance v.s. Junction Temperature

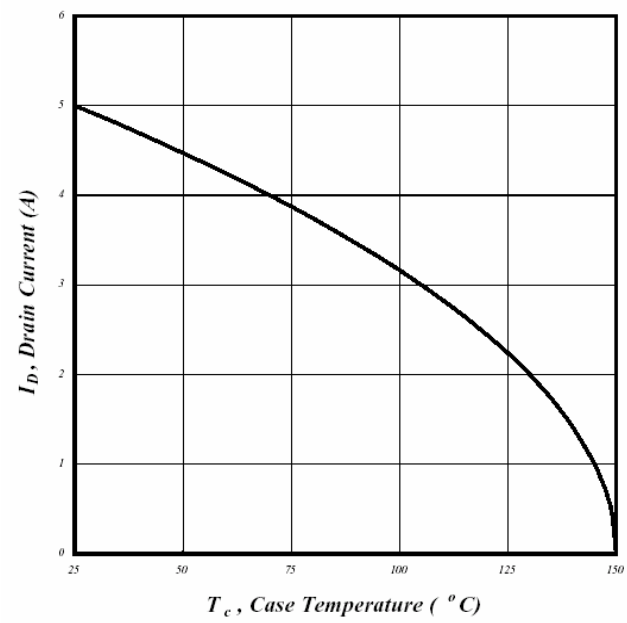


Fig 5. Maximum Drain Current v.s. Case Temperature

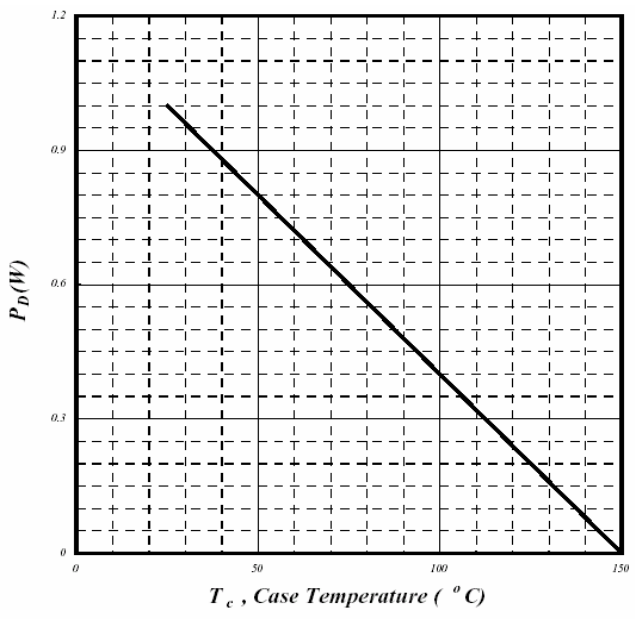


Fig 6. Typical Power Dissipation

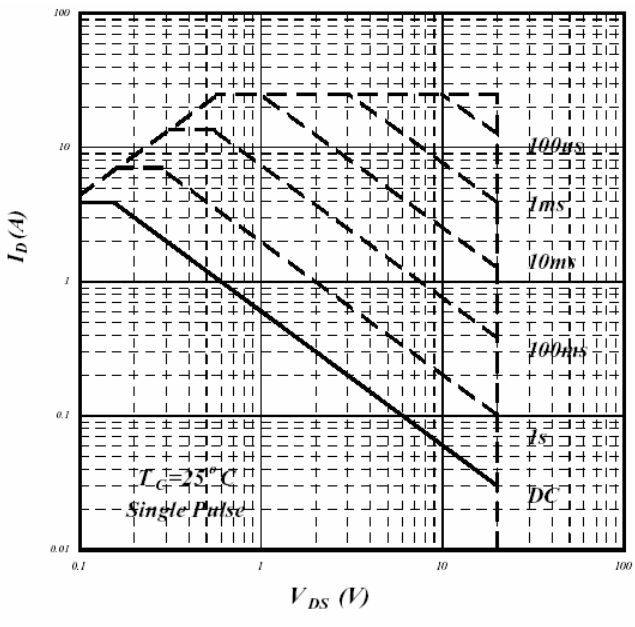


Fig 7. Maximum Safe Operating Area

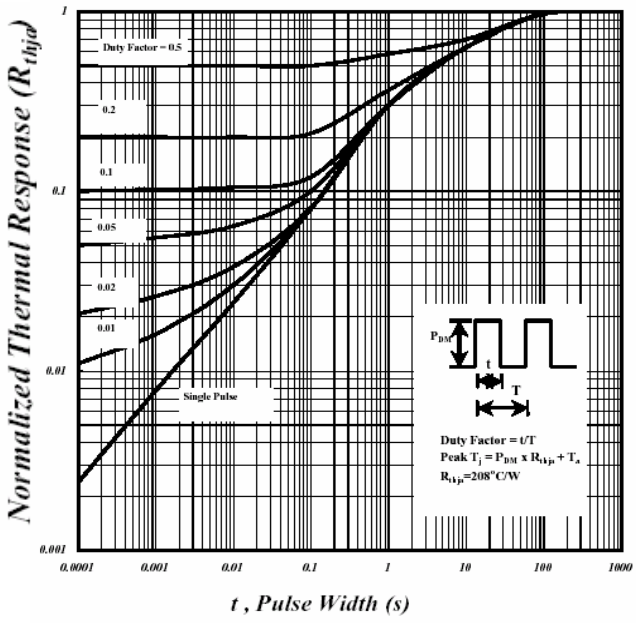


Fig 8. Effective Transient Thermal Impedance

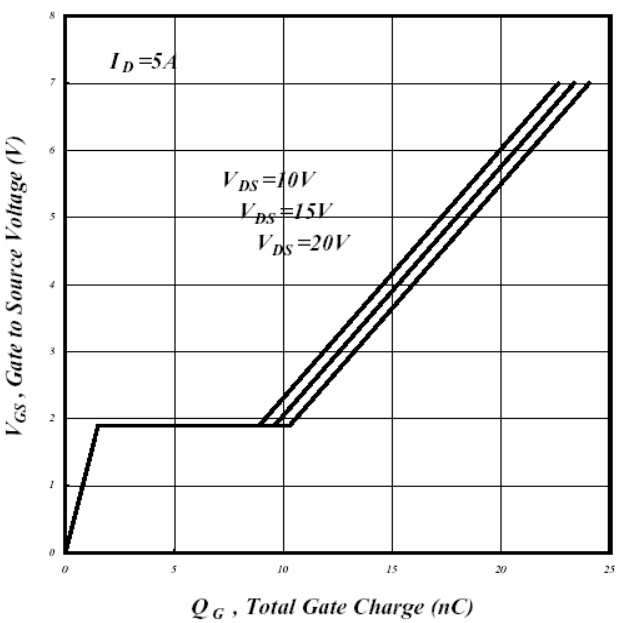


Fig 9. Gate Charge Characteristics

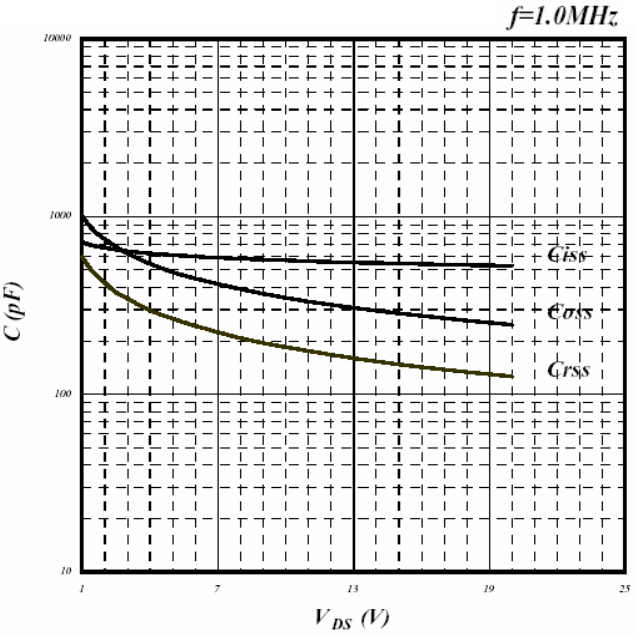


Fig 10. Typical Capacitance Characteristics

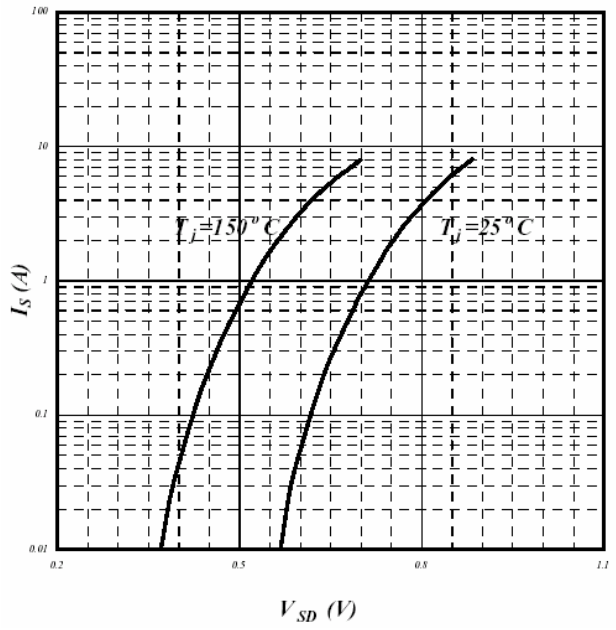


Fig 11. Forward Characteristic of Reverse Diode

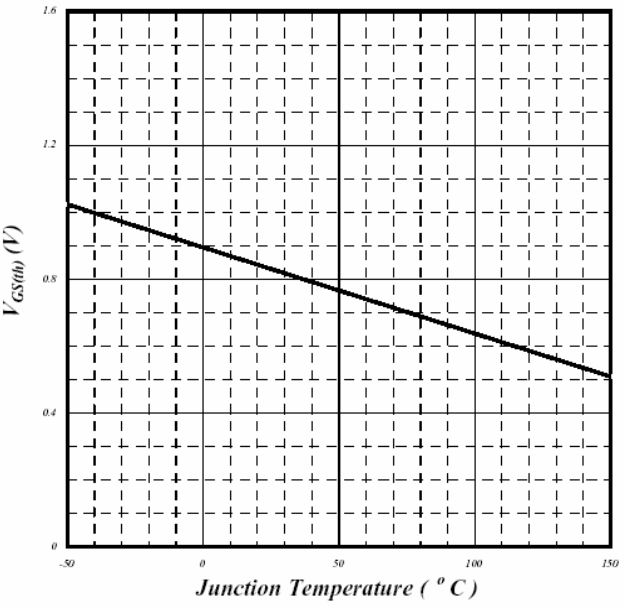


Fig 12. Gate Threshold Voltage v.s. Junction Temperature

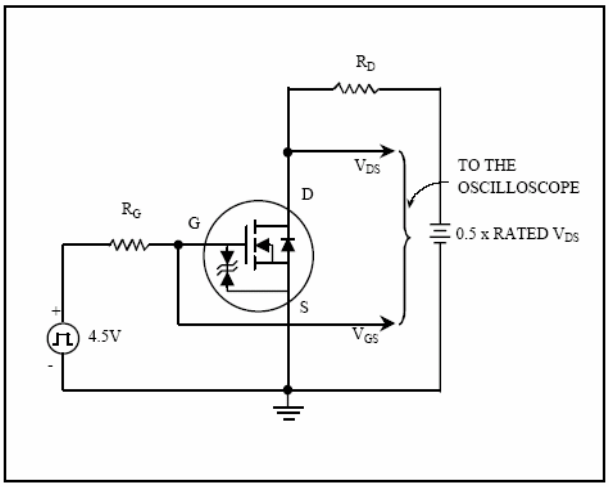


Fig 13. Switching Time Circuit

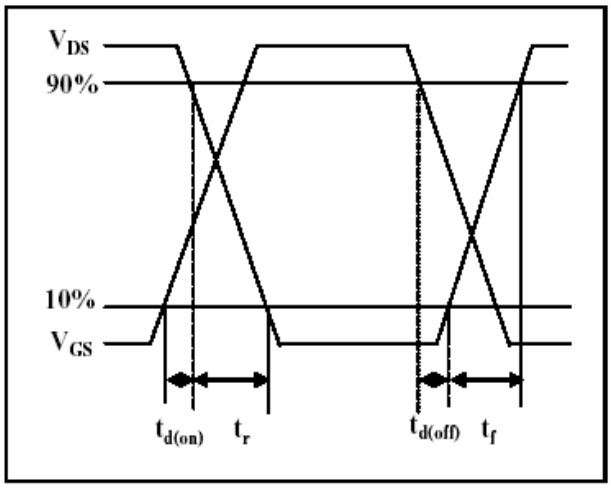


Fig 14. Switching Time Waveform

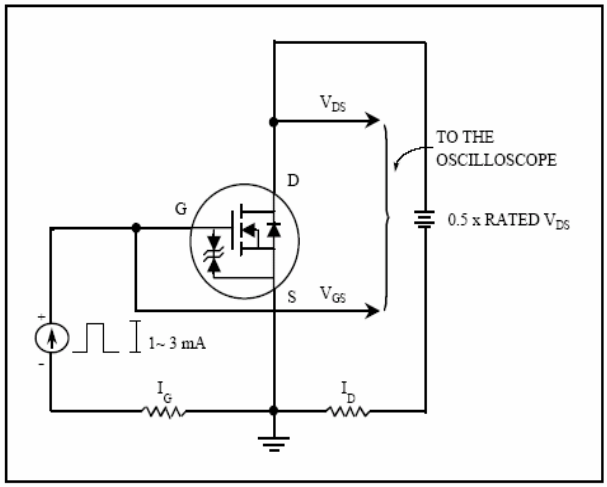


Fig 15. Gate Charge Circuit

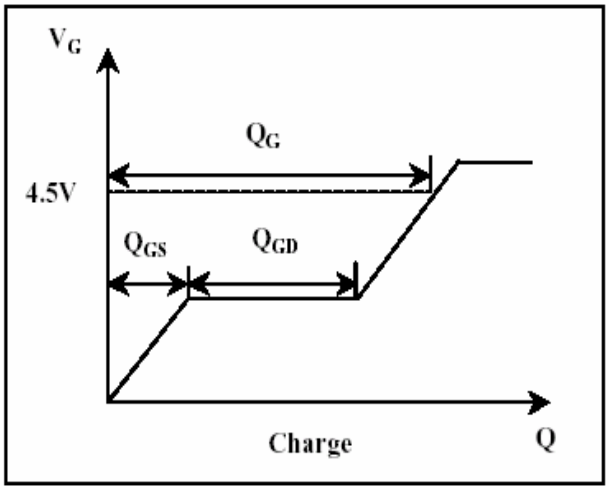


Fig 16. Gate Charge Waveform

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