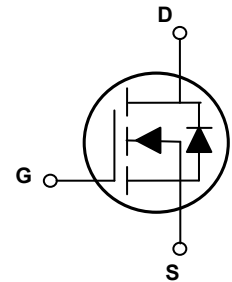
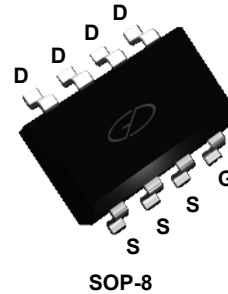


Main Product Characteristics

BV_{DSS}	150V
$R_{DS(ON)}$	46m Ω
I_D	4A



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery



Description

The GSFQ1504 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

Absolute Maximum Ratings (T_C=25°C unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	V_{DS}	150	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous (T _A =25°C)	I_D	4	A
Drain Current-Continuous (T _A =70°C)		3.2	
Drain Current-Pulsed ¹	I_{DM}	16	A
Single Pulse Avalanche Energy ²	E_{AS}	29	mJ
Single Pulse Avalanche Current ²	I_{AS}	24	A
Power Dissipation (T _A =25°C)	P_D	2	W
Power Dissipation-Derate above 25°C		0.016	
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	°C/W
Operating Junction Temperature Range	T_J	-55 To +150	°C
Storage Temperature Range	T_{STG}	-55 To +150	°C

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On/Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	150	-	-	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=120V, V_{GS}=0V, T_J=25^{\circ}\text{C}$	-	-	1	μA
		$V_{DS}=120V, V_{GS}=0V, T_J=85^{\circ}\text{C}$	-	-	10	μA
Gate-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
Static Drain-Source On-Resistance ³	$R_{DS(ON)}$	$V_{GS}=10V, I_D=4A$	-	38	46	m Ω
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	2.5	3.5	4.5	V
Forward Transconductance	g_{fs}	$V_{DS}=10V, I_D=3A$	-	5	-	S
Dynamic and Switching Characteristics						
Total Gate Charge ^{3,4}	Q_g	$V_{DS}=75V, I_D=2A, V_{GS}=10V$	-	17.4	30	nC
Gate-Source Charge ^{3,4}	Q_{gs}		-	2.7	5	
Gate-Drain Charge ^{3,4}	Q_{gd}		-	6.1	10	
Turn-On Delay Time ^{3,4}	$t_{d(on)}$	$V_{DD}=75V, R_G=6\Omega, V_{GS}=10V, I_D=2A$	-	4.6	10	nS
Rise Time ^{3,4}	t_r		-	15	25	
Turn-Off Delay Time ^{3,4}	$t_{d(off)}$		-	27	45	
Fall Time ^{3,4}	t_f		-	8	15	
Input Capacitance	C_{iss}	$V_{DS}=75V, V_{GS}=0V, F=1\text{MHz}$	-	835	1300	pF
Output Capacitance	C_{oss}		-	75	120	
Reverse Transfer Capacitance	C_{rss}		-	7	15	
Gate Resistance	R_g	$V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$	-	0.8	-	Ω
Drain-Source Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	$V_G=V_D=0V,$	-	-	4	A
Pulsed Source Current	I_{SM}	Force Current	-	-	8	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=1A, T_J=25^{\circ}\text{C}$	-	-	1	V
Reverse Recovery Time ³	t_{rr}	$V_R=100V, I_S=2A, di/dt=100A/\mu s, T_J=25^{\circ}\text{C}$	-	70	-	nS
Reverse Recovery Charge ³	Q_{rr}		-	250	-	nC

Note:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. $V_{DD}=50V, L=0.1\text{mH}, I_{AS}=24A, R_G=25\Omega,$ starting $T_J=25^{\circ}\text{C}$.
3. The data tested by pulsed , pulse width $\leq 300\mu s,$ duty cycle $\leq 2\%$.
4. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

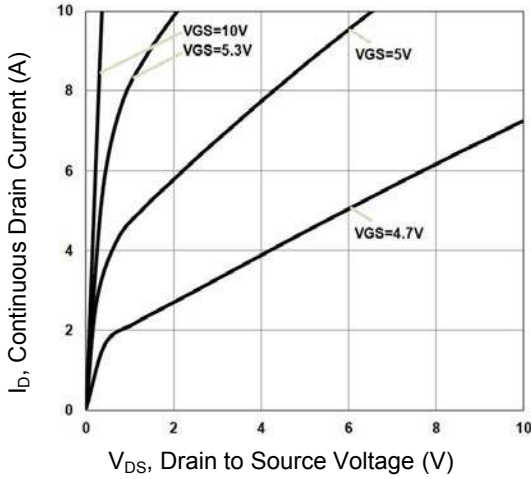


Figure 1. Typical Output Characteristics

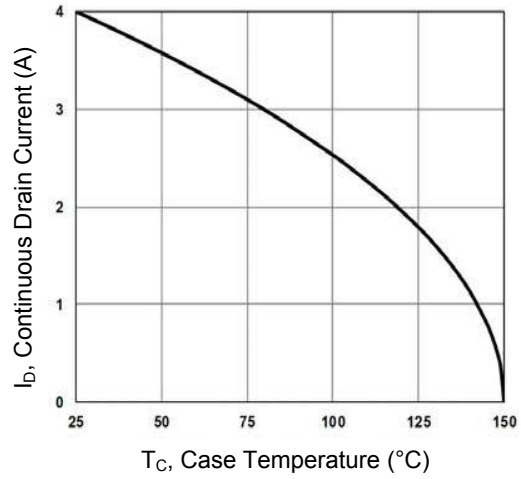


Figure 2. Continuous Drain Current vs. T_C

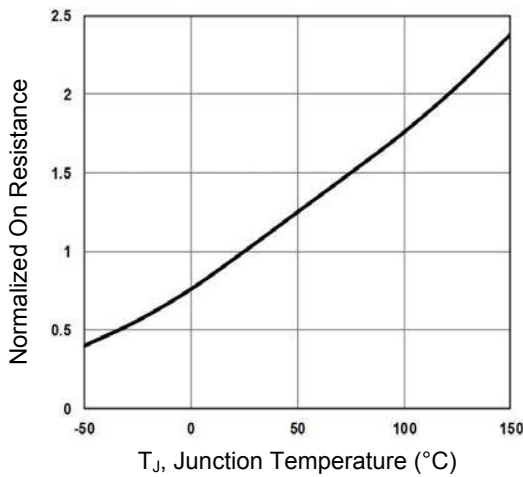


Figure 3. Normalized $R_{DS(ON)}$ vs. T_J

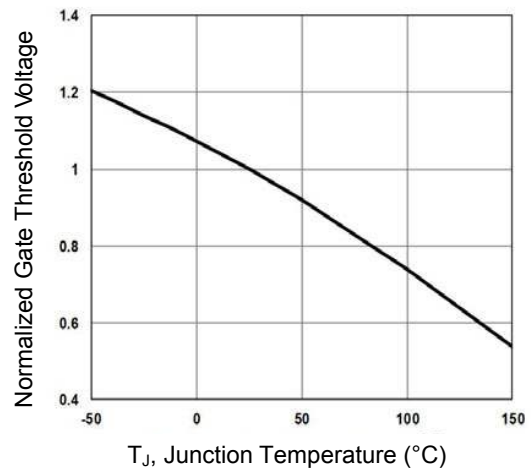


Figure 4. Normalized V_{th} vs. T_J

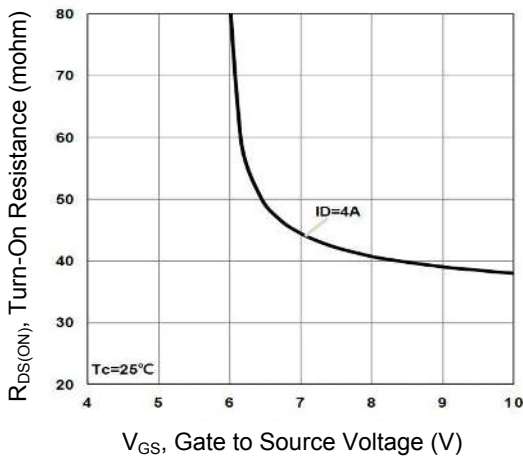


Figure 5. Turn-On Resistance vs. V_{GS}

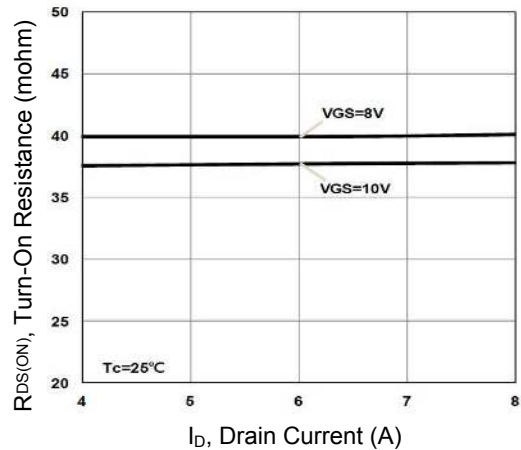


Figure 6. Turn-On Resistance vs. I_D

Typical Electrical and Thermal Characteristic Curves

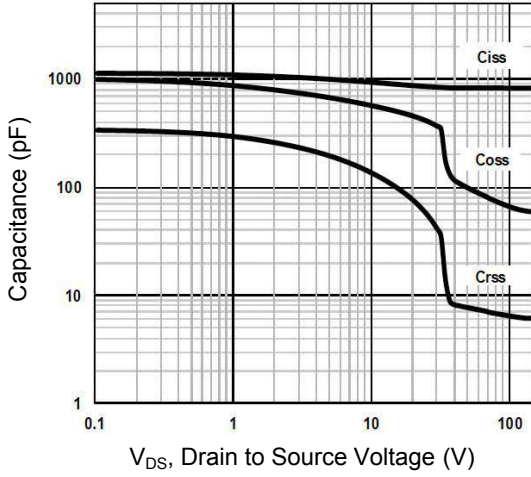


Figure 7. Capacitance Characteristics

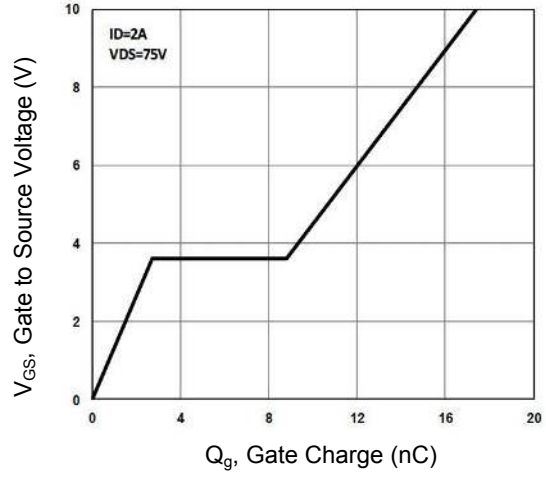


Figure 8. Gate Charge Characteristics

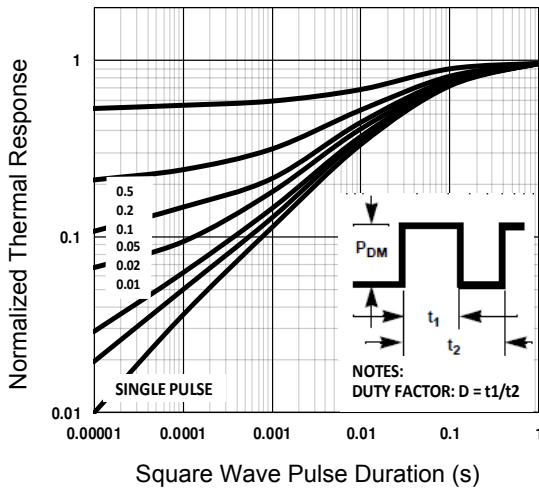


Figure 9. Normalized Transient Impedance

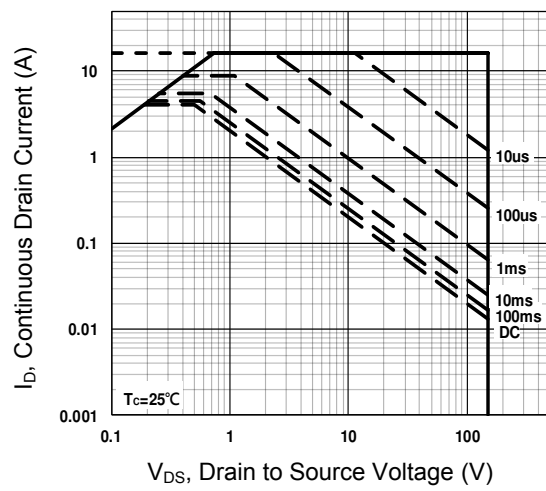


Figure 10. Maximum Safe Operation Area

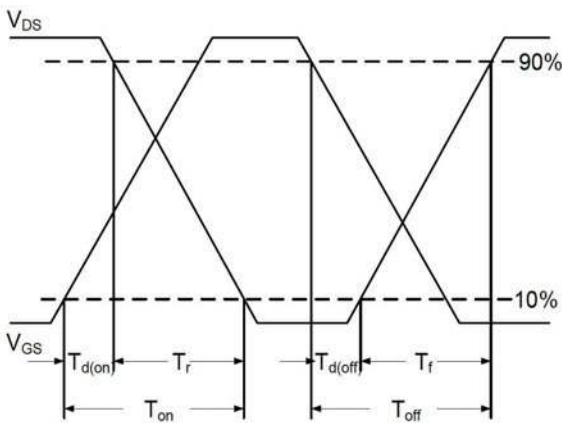


Figure 11. Switching Time Waveform

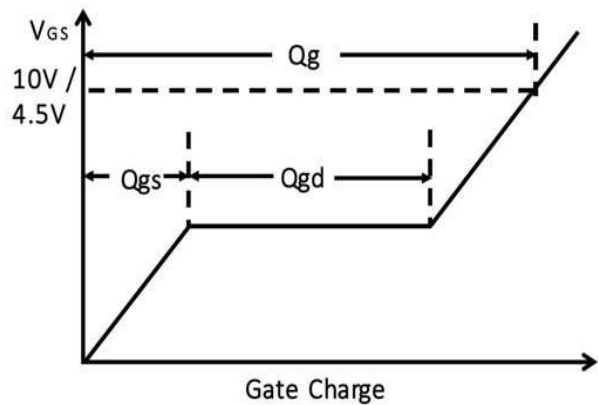
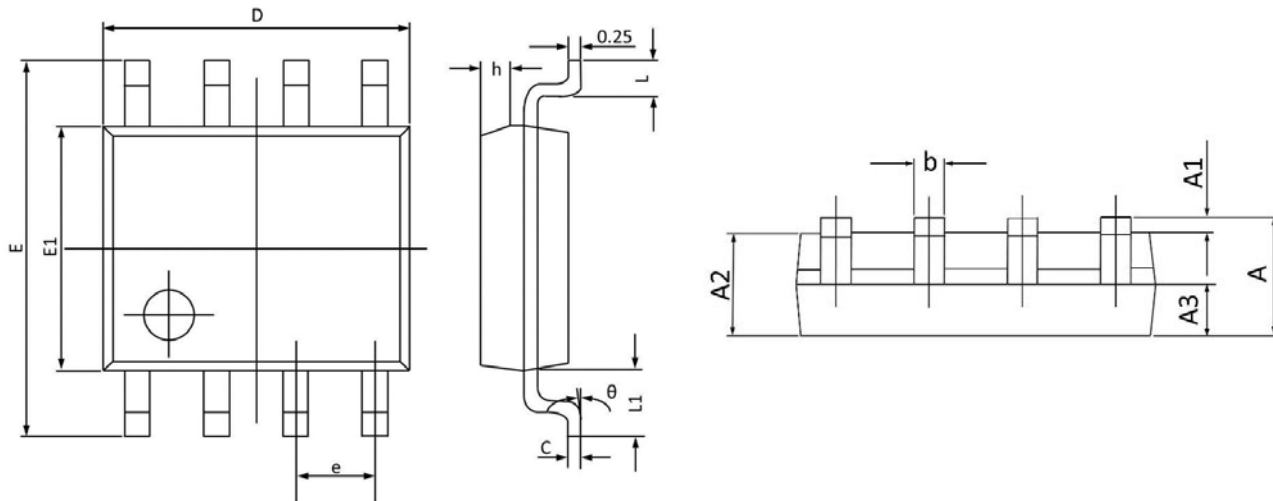


Figure 10. Gate Charge Waveform

Package Outline Dimensions (SOP-8)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.350	1.800	0.053	0.069
A1	0.050	0.250	0.002	0.010
A2	1.250	1.650	0.049	0.065
A3	0.500	0.700	0.020	0.028
b	0.300	0.510	0.012	0.020
c	0.150	0.260	0.006	0.010
D	4.700	5.100	0.185	0.201
E	5.800	6.200	0.228	0.244
E1	3.700	4.100	0.146	0.161
e	1.270 BSC		0.050 BSC	
h	0.250	0.500	0.010	0.020
L	0.400	1.000	0.016	0.039
L1	1.050 BSC		0.041 BSC	
theta	0°	8°	0°	8°

Order Information

Device	Package	Marking	Carrier	Quantity
GSFQ1504	SOP-8	04N15BH	Tape & Reel	3,000 pcs / Reel