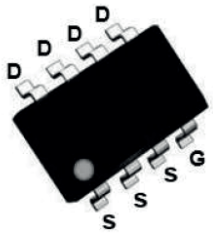
GOOD-ARK SEMICONDUCTOR

GSFQ2504

250V N-Channel MOSFET

Main Product Characteristics

$V_{(BR)DSS}$	250V
$R_{DS(ON)}$	0.26Ω (Max.)
I_D	4.4A



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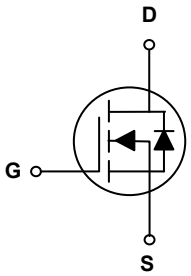


Schematic Diagram

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 GSFQ2504 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}	250	V
Gate-to-Source Voltage	V_{GS}	±30	V
Continuous Drain Current, @ Steady-State (T_C=25°C)	I_D	4.4	A
Continuous Drain Current, @ Steady-State (T_C=100°C)		2.8	A
Pulsed Drain Current[1]	I_{DM}	17.6	A
Power Dissipation (T_C=25°C)	P_D	6.2	W
		0.049	W/°C
Single Pulse Avalanche Energy	E_{AS}	240	mJ
Body Diode Reverse Voltage Slop	dv/dt	4.5	V/ns
MOS dv/dt Ruggedness	dv/dt	50	V/ns
Thermal Resistance, Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	20.2	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C
Maximum Lead Temperature for Soldering Purposes	T_L	260	°C

Electrical Characteristics (T_C=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V, I_D=250μA	250	-	-	V
Drain-to-Source Leakage Current	I_{DSS}	V_{DS}=250V, V_{GS}=0V, T_C=25°C	-	-	1.0	μA
		V_{DS}=200V, T_C=125°C	-	-	100	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{DS}=0V, V_{GS}=30V	-	-	100	nA
		V_{DS}=0V, V_{GS}=-30V	-	-	-100	
Static Drain-to-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=3A	-	0.22	0.26	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	3.0	-	4.4	V
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz	-	673	-	pF
Output Capacitance	C_{oss}		-	107	-	
Reverse Transfer Capacitance	C_{rss}		-	13	-	
Total Gate Charge[2,3]	Q_g	I_D=14A, V_{DS}=200V, V_{GS}=10V	-	18	-	nC
Gate-to-Source Charge[2,3]	Q_{gs}		-	7.8	-	
Gate-to-Drain ("Miller") Charge[2,3]	Q_{gd}		-	7.5	-	
Turn-On Delay Time[2,3]	$t_{d(on)}$	V_{DD}=125V, V_{GS}=10V, R_G=25Ω, I_D=14A	-	15	-	nS
Rise Time[2,3]	t_r		-	61	-	
Turn-Off Delay Time[2,3]	$t_{d(off)}$		-	25	-	
Fall Time[2,3]	t_f		-	26	-	
Gate Resistance	R_g	V_{GS}=0V, V_{DS}=0V, f=1MHz	-	3.1	-	Ω
Source-Drain Ratings and Characteristics						
Continuous Source Current (Body Diode)	I_S	T_C=25°C, MOSFET symbol showing the integral reverse p-n junction diode.	-	-	4.4	A
Diode Pulse Current	I_{SM}		-	-	17.6	A
Diode Forward Voltage	V_{SD}	I_S=4.0A, V_{GS}=0V	-	-	1.3	V
Reverse Recovery Time	T_{rr}	Is=4A, V_{GS}=0V, dI_F/dt=100A/us	-	150	-	nS
Reverse Recovery Charge	Q_{rr}		-	500	-	nC

Notes:

1. Pulse width limited by maximum junction temperature.
2. Pulse test: Pulse width ≤300μs, duty cycle ≤2%.
3. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

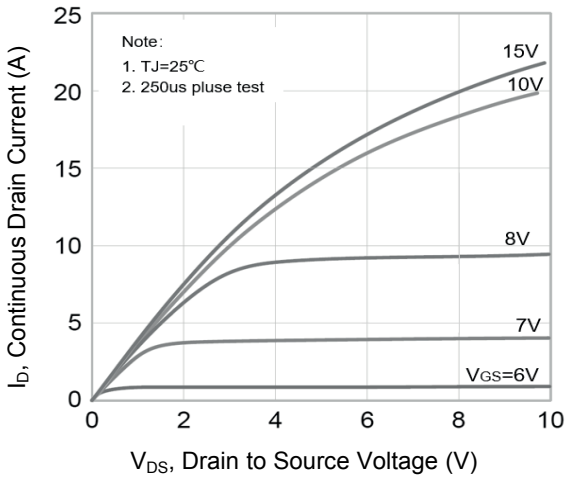


Figure 1. Output Characteristics

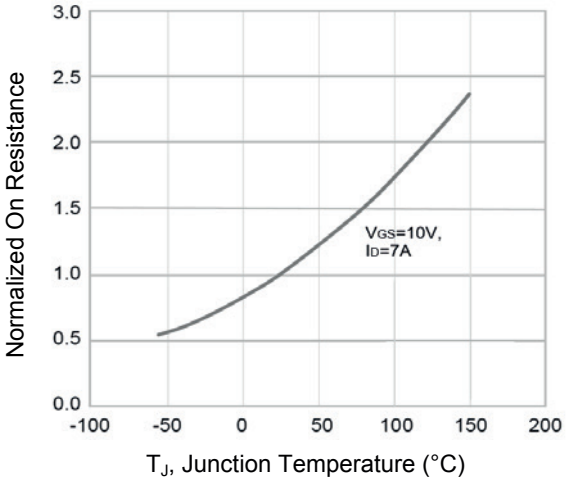


Figure 2. Normalized $R_{DS(ON)}$ vs. T_J

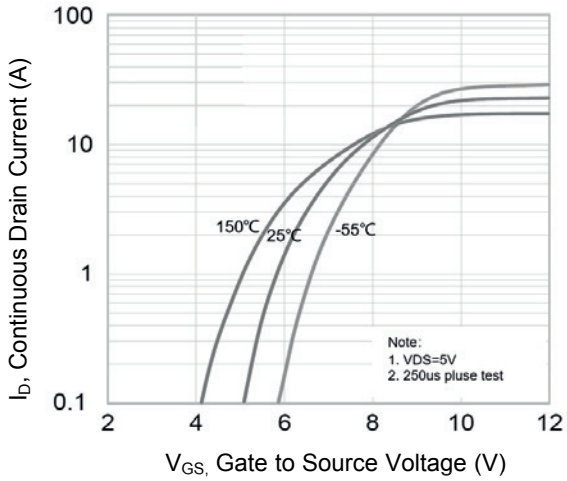


Figure 3. Transfer Characteristics

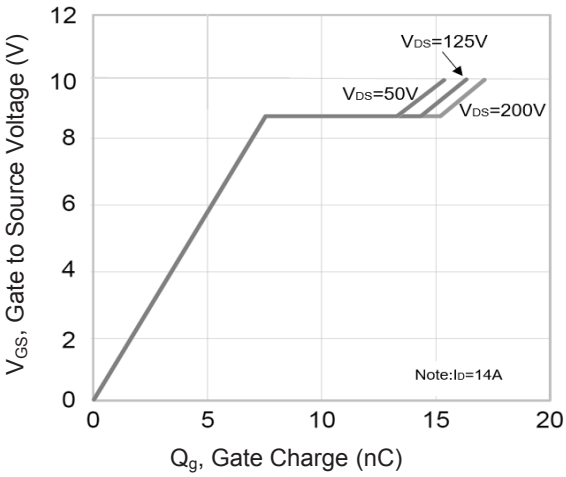


Figure 4. Gate Charge Waveform

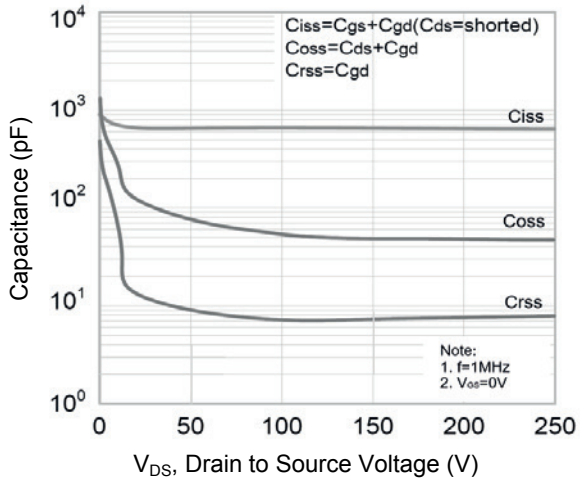


Figure 5. Capacitance Characteristics

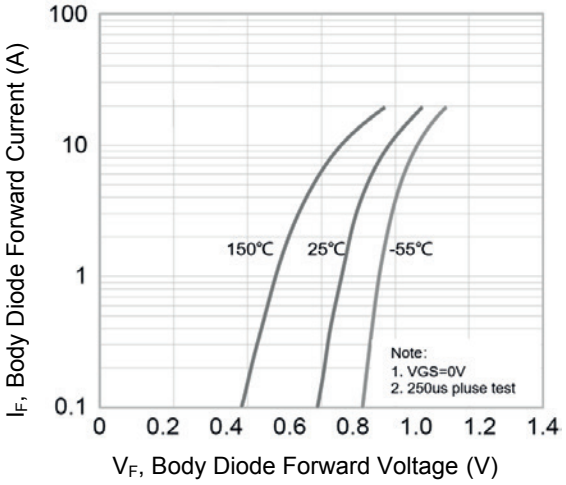
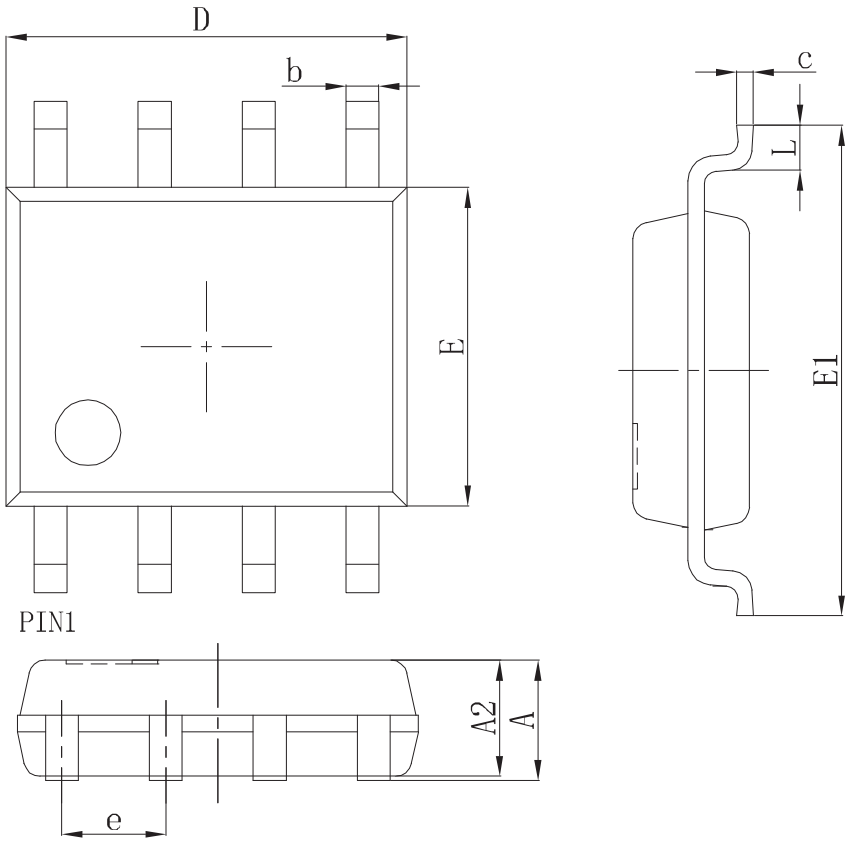


Figure 6. Body Diode Characteristics

Package Outline Dimensions (SOP-8)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.30	1.70	0.051	0.067
A2	1.25	1.55	0.049	0.061
c	0.17	0.25	0.007	0.010
E	3.80	4.00	0.150	0.157
E1	5.80	6.20	0.228	0.244
L	0.45	0.75	0.018	0.030
b	0.33	0.51	0.013	0.020
D	4.80	5.00	0.189	0.197
e	1.27 BSC		0.050 BSC	

Order Information

Device	Package	Marking	Carrier	Quantity
GSFQ2504	SOP-8	Q2504	Tape & Reel	3,000 Pcs / Reel