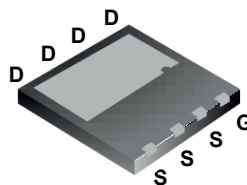
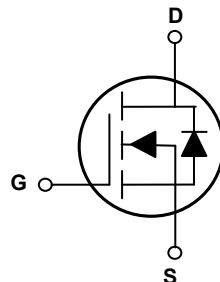


Main Product Characteristics

$V_{(BR)DSS}$	650V
$R_{DS(ON)}$	0.22Ω (Max.)
I_D	20A



DFN8x8



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 GSFX65R220 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 ($T_C=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Parameter.	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-to-Source Voltage	V_{GS}	± 30	V
Continuous Drain Current, @ Steady-State ($T_C=25^{\circ}\text{C}$)	I_D	20	A
Continuous Drain Current, @ Steady-State ($T_C=100^{\circ}\text{C}$)		12	A
Pulsed Drain Current	I_{DM}	80	A
Power Dissipation ($T_C=25^{\circ}\text{C}$)	P_D	125	W
		1	W/ $^{\circ}\text{C}$
Single Pulse Avalanche Energy ¹	E_{AS}	657	mJ
Body Diode Reverse Voltage Slope ²	dv/dt	15	V/ns
MOS dv/dt Reggedness ³	dv/dt	100	V/ns
Junction-to-Ambient (PCB Mounted, Steady-State)	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
Junction-to-Case	$R_{\theta JC}$	1	$^{\circ}\text{C/W}$
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to + 150	$^{\circ}\text{C}$

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	650	-	-	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V	-	-	1	μA
Gate-to-Source Forward Leakage	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 =10A	-	0.19	0.22	Ω
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	-	4.0	V
Dynamic and Switching Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =100V, f=1MHz	-	1718	-	pF
Output Capacitance	C _{oss}		-	66	-	
Reverse Transfer Capacitance	C _{rss}		-	1.7	-	
Total Gate Charge ^{4,5}	Q _g	I _D =20A, V _{DD} =520V, V _{GS} =10V	-	48	-	nC
Gate-to-Source Charge ^{4,5}	Q _{gs}		-	20	-	
Gate-to-Drain ("Miller") Charge ^{4,5}	Q _{gd}		-	19	-	
Turn-on Delay Time ^{4,5}	t _{d(on)}	V _{DD} =325V, V _{GS} =10V, R _G =25Ω, I _D =20A	-	32	-	nS
Rise Time ^{4,5}	t _r		-	96	-	
Turn-Off Delay Time ^{4,5}	t _{d(off)}		-	105	-	
Fall Time ^{4,5}	t _f		-	75	-	
Gate Resistance	R _g	f=1MHz	-	1.3	-	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.	-	-	20	A
Source Pulse Current	I _{SM}		-	-	80	A
Diode Forward Voltage	V _{SD}	I _S =20A, V _{GS} =0V	-	1.1	1.4	V
Reverse Recovery Time ²	T _{rr}	I _F =20A, V _{DD} =50V, dI _F /dt=100A/μs	-	330	-	nS
Reverse Recovery Charge ²	Q _{rr}		-	5.7	-	μC

Notes

1. L=79mH, I_{AS}=3.8A, V_{DD}=100V, R_G=25Ω, starting temperature T_J=25°C.
2. V_{DS}=0-400V, I_{SD}≤I_S, T_J=25°C.
3. V_{DS}=0-480V.
4. Pulse test : pulse width ≤ 300μs, duty cycle ≤ 2%.
5. Essentially independent of operating temperature.

Typical Electrical and Thermal Characteristic Curves

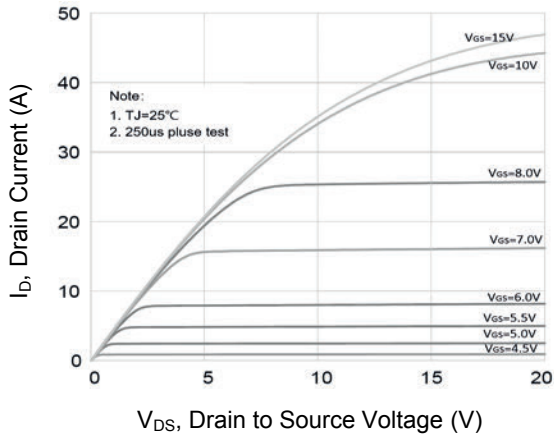


Figure 1. Typical Output Characteristics

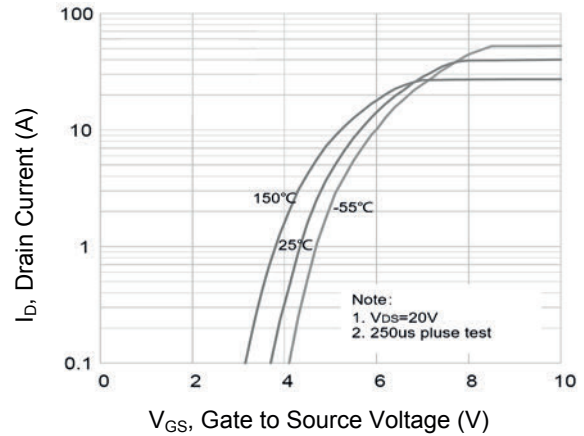


Figure 2. Transfer Characteristics

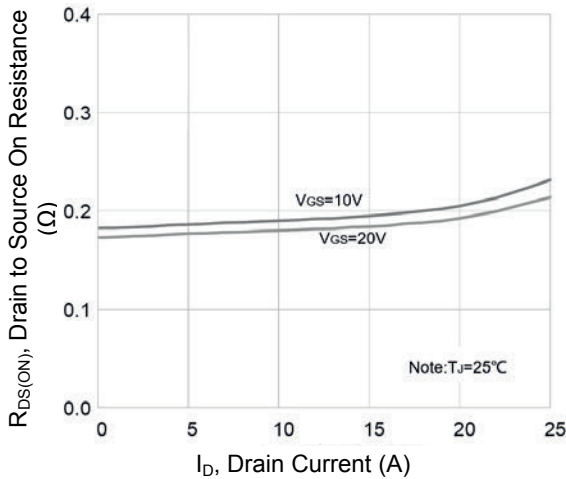


Figure 3. $R_{DS(ON)}$ Vs. Drain Current

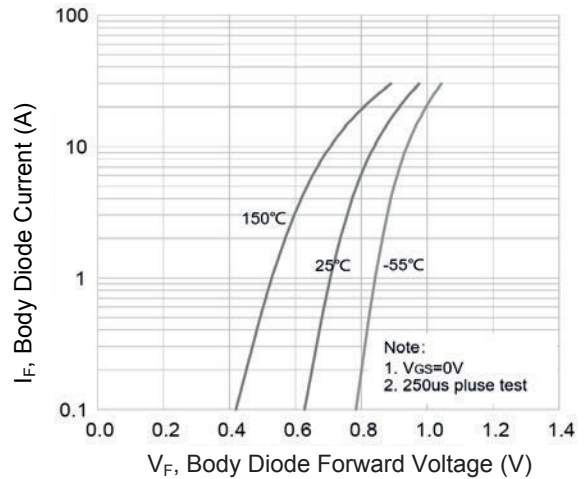


Figure 4. Body Diode Characteristics

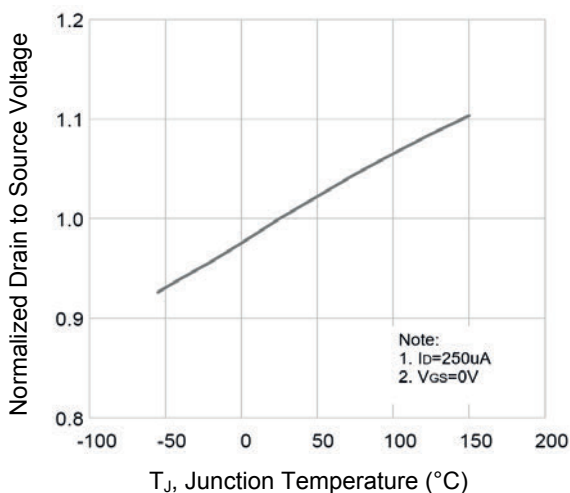


Figure 5. Normalized BV_{DS} Vs. T_J

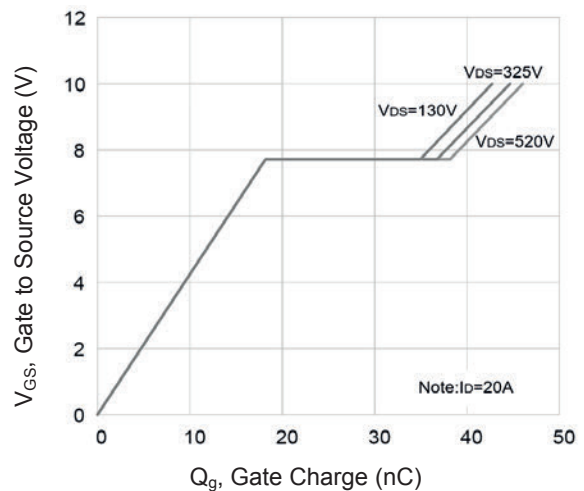


Figure 6. Gate Charge

Typical Electrical and Thermal Characteristic Curves

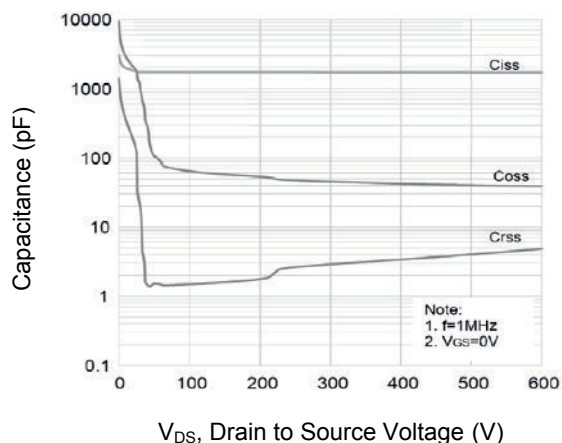


Figure 7. Capacitance Characteristics

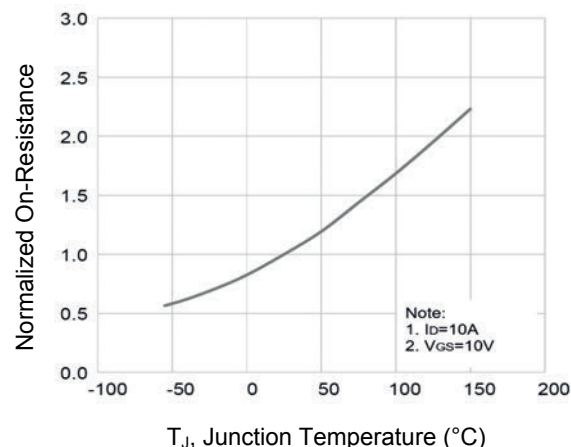


Figure 8. Normalized $R_{DS(ON)}$ Vs. T_J

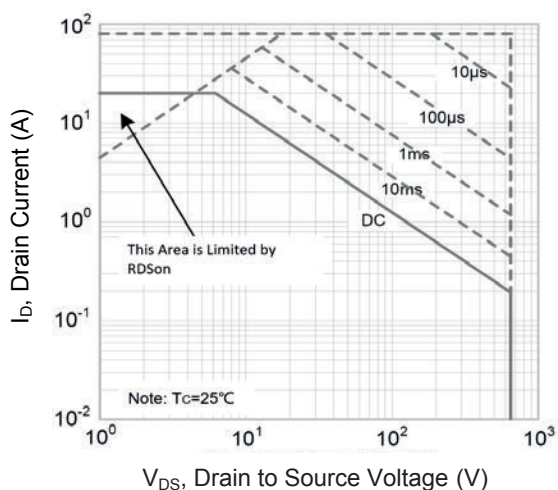
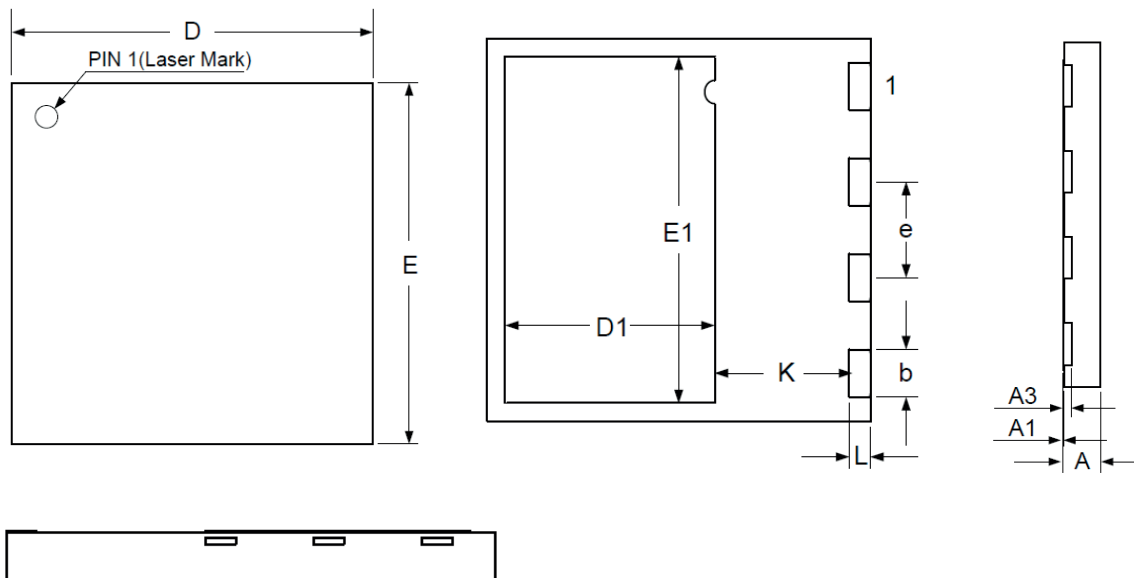


Figure 9. Safe Operation Area

Package Outline Dimensions (DFN8x8)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.80	0.90	0.031	0.035
A1	0.00	0.05	0.000	0.002
A3	0.20 REF		0.008 REF	
b	0.90	1.10	0.035	0.043
D	7.90	8.10	0.311	0.319
D1	4.25	4.45	0.167	0.175
E	7.90	8.10	0.311	0.319
E1	7.10	7.30	0.280	0.287
e	1.90	2.10	0.075	0.083
K	2.65	2.85	0.104	0.112
L	0.40	0.60	0.016	0.024