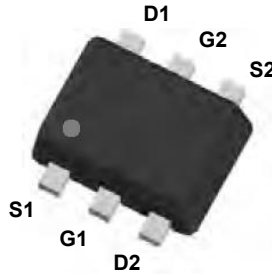
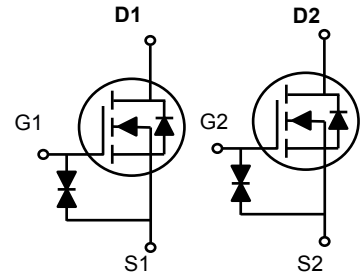


**Main Product Characteristics**

$V_{(BR)DSS}$	20V
$R_{DS(ON)}$	300mΩ
$I_D$	800mA



SOT-563



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
- ESD protection up to 2KV



**Description**

The SSF2220Y 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 supply and a wide variety of other applications.

**Absolute Maximum Ratings** ( $T_C=25^{\circ}C$  unless otherwise specified)

Parameter	Symbol	Max.	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±8	V
Drain Current-Continuous ( $T_C=25^{\circ}C$ )	$I_D$	800	mA
Drain Current-Continuous ( $T_C=100^{\circ}C$ )		510	
Drain Current-Pulsed <sup>1</sup>	$I_{DM}$	3.2	A
Power Dissipation ( $T_C=25^{\circ}C$ )	$P_D$	312	mW
Power Dissipation-Derate above 25°C		2.5	mW/°C
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	400	°C/W
Operating Junction Temperature Range	$T_J$	-55 To +150	°C
Storage Temperature Range	$T_{STG}$	-55 To +150	°C

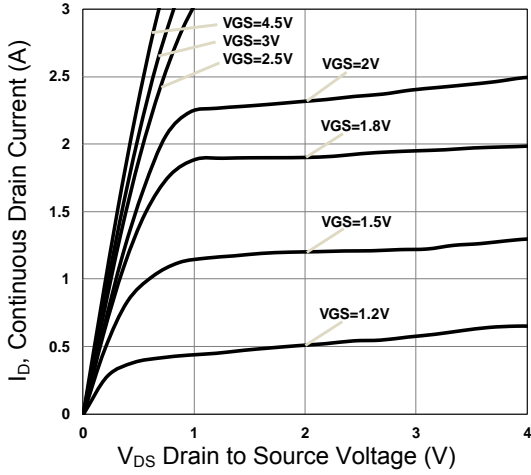
### Electrical Characteristics ( $T_J=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>On/Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
$BV_{DSS}$ Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	Reference to $25^\circ\text{C}$ , $I_D=1\text{mA}$	-	0.01	-	$V/^\circ\text{C}$
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS}=20V, V_{GS}=0V,$ $T_J=25^\circ\text{C}$	-	-	1	$\mu A$
		$V_{DS}=16V, V_{GS}=0V,$ $T_J=125^\circ\text{C}$	-	-	10	$\mu A$
Gate-Source Leakage Current	$I_{GSS}$	$V_{GS}=\pm 4.5V, V_{DS}=0V$	-	-	$\pm 1$	$\mu A$
		$V_{GS}=\pm 8V, V_{DS}=0V$	-	-	$\pm 10$	$\mu A$
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS}=4.5V, I_D=0.5A$	-	200	300	m $\Omega$
		$V_{GS}=2.5V, I_D=0.4A$	-	235	400	
		$V_{GS}=1.8V, I_D=0.2A$	-	295	550	
		$V_{GS}=1.5V, I_D=0.1A$	-	365	800	
		$V_{GS}=1.2V, I_D=0.1A$	-	600	1500	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS}=V_{DS}, I_D=250\mu A$	0.3	0.6	1.0	V
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}$		-	3	-	$\text{mV}/^\circ\text{C}$
<b>Dynamic and Switching Characteristics</b>						
Total Gate Charge <sup>2,3</sup>	$Q_g$	$V_{DS}=10V, I_D=0.5A$ $V_{GS}=4.5V$	-	1	2	nC
Gate-Source Charge <sup>2,3</sup>	$Q_{gs}$		-	0.26	0.5	
Gate-Drain Charge <sup>2,3</sup>	$Q_{gd}$		-	0.2	0.4	
Turn-On Delay Time <sup>2,3</sup>	$t_{d(on)}$	$V_{DD}=10V, R_G=10\Omega$ $V_{GS}=4.5V, I_D=0.5A$	-	5	10	nS
Rise Time <sup>2,3</sup>	$t_r$		-	3.5	7	
Turn-Off Delay Time <sup>2,3</sup>	$t_{d(off)}$		-	14	28	
Fall Time <sup>2,3</sup>	$t_f$		-	6	12	
Input Capacitance	$C_{iss}$	$V_{DS}=10V, V_{GS}=0V,$ $F=1\text{MHz}$	-	38.2	75	pF
Output Capacitance	$C_{oss}$		-	14.4	28	
Reverse Transfer Capacitance	$C_{rss}$		-	6	12	
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
Continuous Source Current	$I_S$	$V_G=V_D=0V,$ Force Current	-	-	0.8	A
Pulsed Source Current	$I_{SM}$		-	-	1.6	A
Diode Forward Voltage	$V_{SD}$	$V_{GS}=0V, I_S=0.3A,$ $T_J=25^\circ\text{C}$	-	-	1.2	V

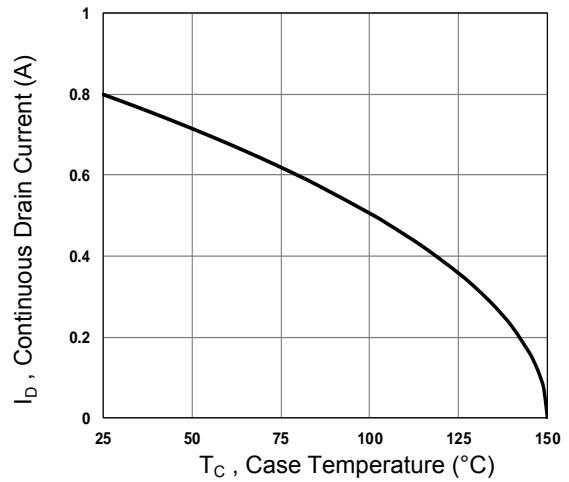
Note:

1. Repetitive Rating: Pulsed width limited by maximum junction temperature.
2. Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
3. Essentially independent of operating temperature.

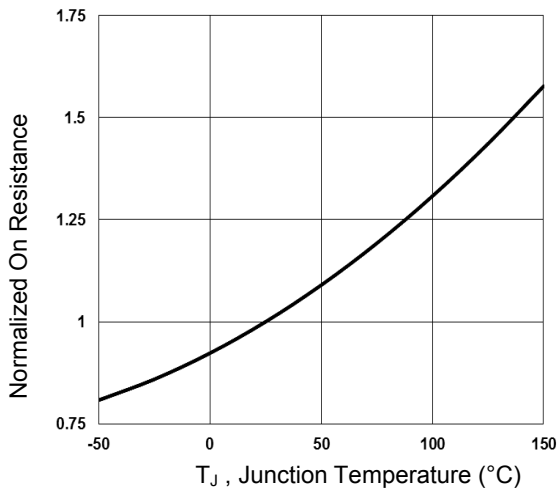
**Typical Electrical and Thermal Characteristic Curves**



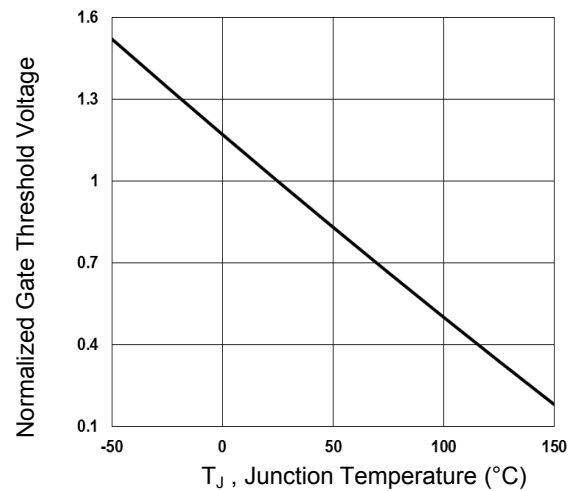
**Figure 1. Typical Output Characteristics**



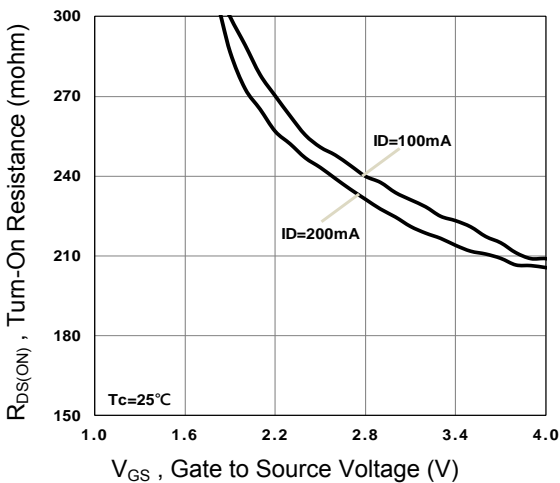
**Figure 2. Continuous Drain Current vs. TC**



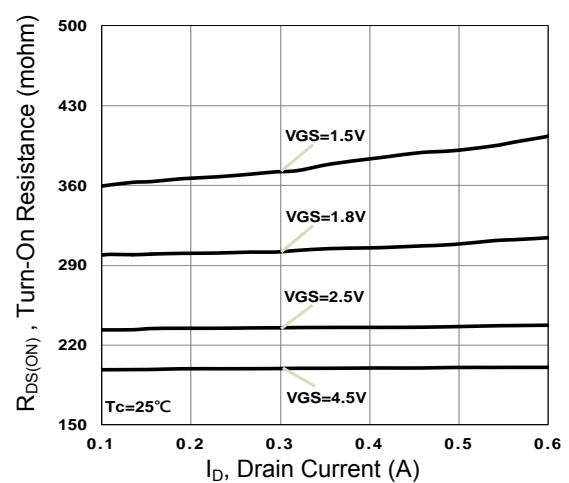
**Figure 3. Normalized  $R_{DS(ON)}$  vs.  $T_J$**



**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

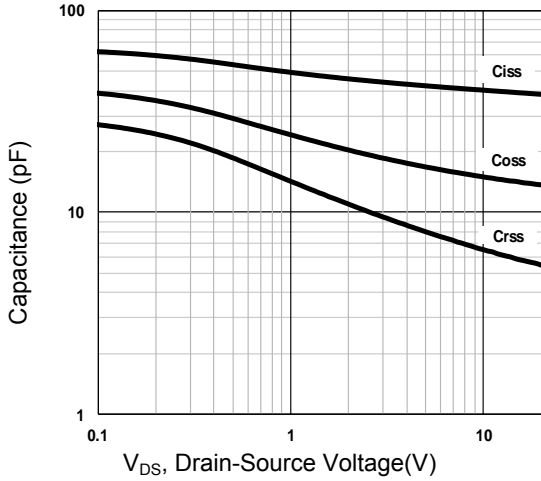


Figure 7. Capacitance Characteristics

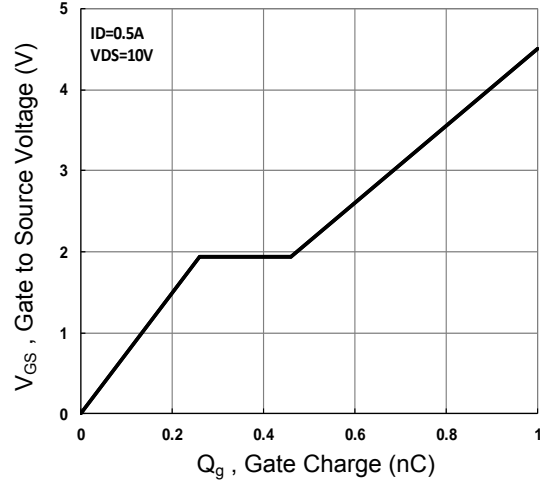


Figure 8. Gate Charge Characteristics

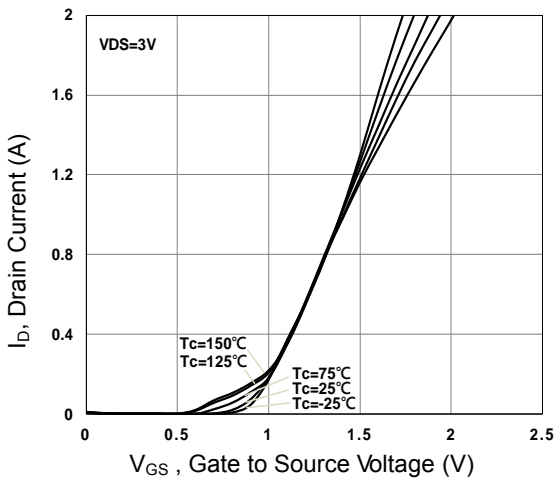


Figure 9. Transfer Characteristics

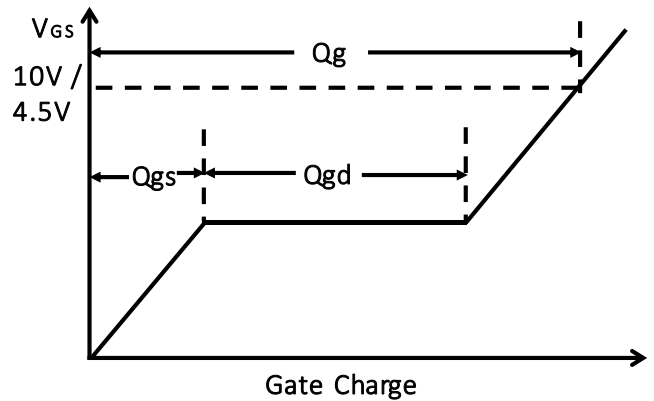


Figure 10. Gate Charge Waveform

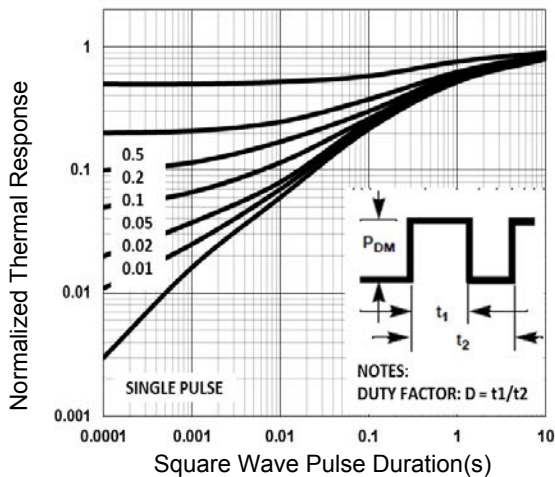


Figure 11. Normalized Transient Impedance

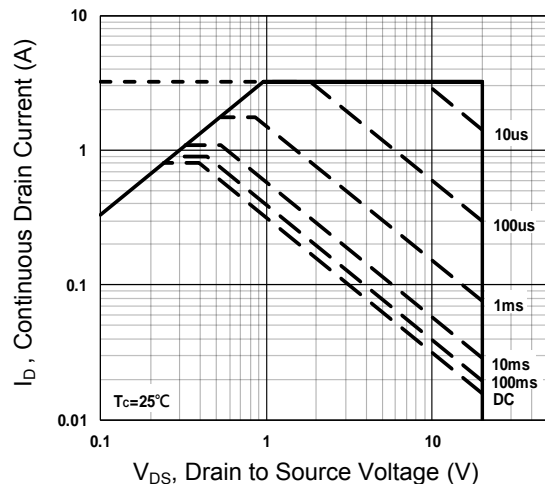
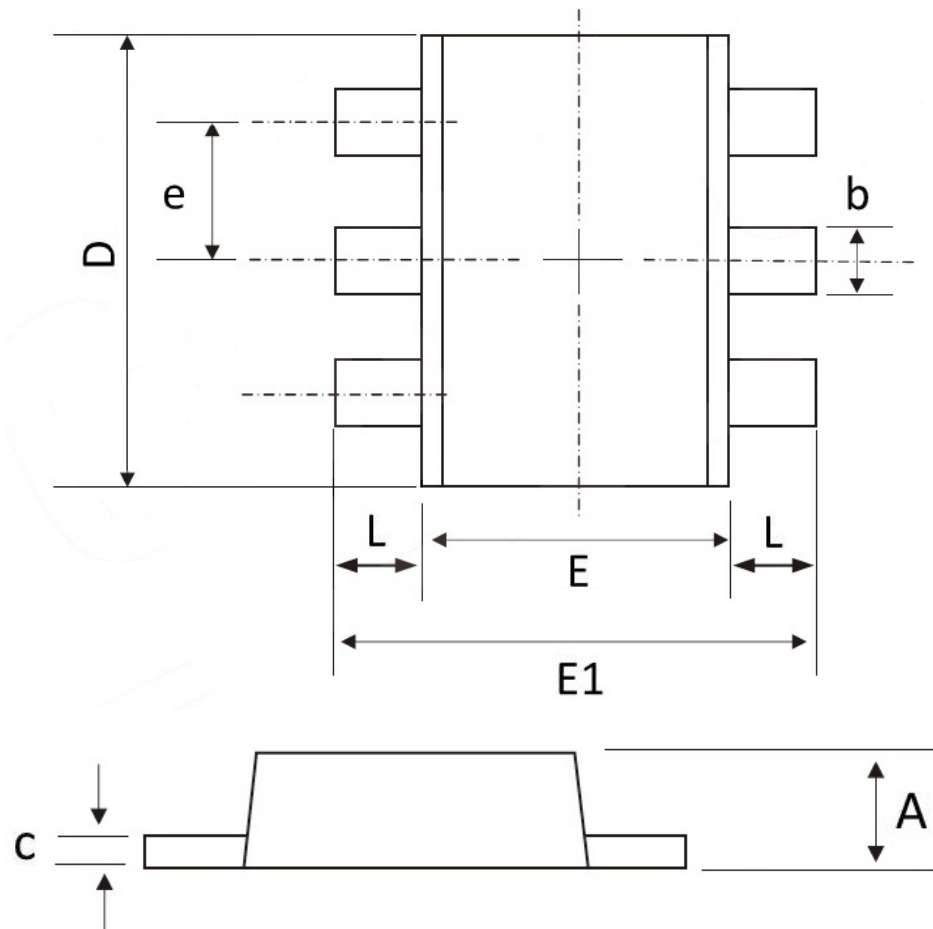


Figure 12. Maximum Safe Operation Area

## Package Outline Dimensions

## SOT-563



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	0.600	0.500	0.024	0.020
b	0.300	0.150	0.012	0.006
c	0.180	0.100	0.007	0.004
D	1.700	1.500	0.067	0.059
E	1.250	1.100	0.049	0.043
E1	1.700	1.550	0.067	0.061
e	0.5BSC		0.02BSC	
L	0.300	0.100	0.012	0.004

## Order Information

Device	Package	Marking Code	Carrier	Quantity	HSF Status
SSF2220Y	SOT-563	C	Tape & Reel	3,000/Reel	RoHS Compliant