

## Description

These dual N Channel enhancement mode power field effect transistors are using trench DMOS technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for high efficiency fast switching applications.

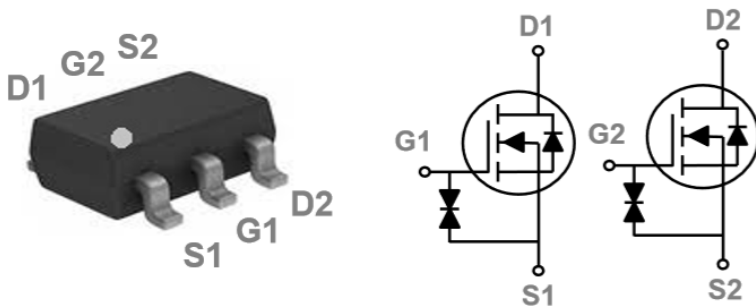
## Features

- ◆Fast switching
- ◆Green Device Available
- ◆Suit for 1.5V Gate Drive Applications

## Application

- ◆Notebook
- ◆Load Switch
- ◆Networking
- ◆Hand-held Instruments

## SOT363 Dual Pin Configuration



BVDSS	RDSON	ID
20V	300mΩ	800mA

## Absolute Maximum Ratings (T<sub>c</sub>=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V <sub>DS</sub>	Drain-Source Voltage	20	V
V <sub>GS</sub>	Gate-Source Voltage	±8	V
I <sub>D</sub>	Drain Current – Continuous (T <sub>C</sub> =25°C)	800	mA
	Drain Current – Continuous (T <sub>C</sub> =100°C)	510	mA
I <sub>DM</sub>	Drain Current – Pulsed <sup>1</sup>	3.2	A
P <sub>D</sub>	Power Dissipation (T <sub>C</sub> =25°C)	275	mW
	Power Dissipation – Derate above 25°C	2.2	mW/°C
T <sub>STG</sub>	Storage Temperature Range	-55 to 150	°C
T <sub>J</sub>	Operating Junction Temperature Range	-55 to 150	°C

## Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
R <sub>θJA</sub>	Thermal Resistance Junction to ambient	---	450	°C/W



## Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)

### Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV <sub>DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250uA	20	---	---	V
ΔBV <sub>DSS</sub> /ΔT <sub>J</sub>	BVDSS Temperature Coefficient	Reference to 25°C, I <sub>D</sub> =1mA	---	-0.01	---	V/°C
I <sub>DSS</sub>	Drain-Source Leakage Current	V <sub>DS</sub> =20V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C	---	---	1	uA
		V <sub>DS</sub> =16V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	---	---	10	uA
I <sub>GSS</sub>	Gate-Source Leakage Current	V <sub>GS</sub> =±6V, V <sub>DS</sub> =0V	---	---	±20	uA

### On Characteristics

R <sub>DS(ON)</sub>	Static Drain-Source On-Resistance	V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A	---	200	300	mΩ
		V <sub>GS</sub> =2.5V, I <sub>D</sub> =0.4A	---	235	400	
		V <sub>GS</sub> =1.8V, I <sub>D</sub> =0.2A	---	295	550	
		V <sub>GS</sub> =1.5V, I <sub>D</sub> =0.1A	---	365	800	
		V <sub>GS</sub> =1.2V, I <sub>D</sub> =0.1A	---	600	1500	
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>GS</sub> =V <sub>DS</sub> , I <sub>D</sub> =250uA	0.3	0.6	1.0	V
ΔV <sub>GS(th)</sub>	VGS(th) Temperature Coefficient		---	3	---	mV/°C

### Dynamic and switching Characteristics

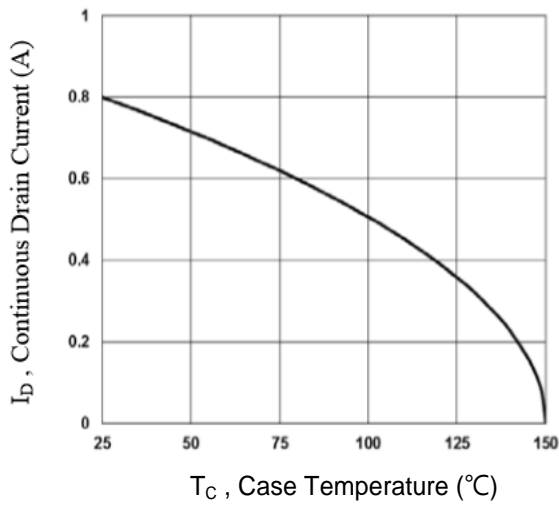
Q <sub>g</sub>	Total Gate Charge <sup>2, 3</sup>	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =0.5A	---	1	2	nC
Q <sub>gs</sub>	Gate-Source Charge <sup>2, 3</sup>		---	0.26	0.5	
Q <sub>gd</sub>	Gate-Drain Charge <sup>2, 3</sup>		---	0.2	0.4	
T <sub>d(on)</sub>	Turn-On Delay Time <sup>2, 3</sup>	V <sub>DD</sub> =10V, V <sub>GS</sub> =4.5V, R <sub>G</sub> =10Ω, I <sub>D</sub> =0.5A	---	5	10	ns
T <sub>r</sub>	Rise Time <sup>2, 3</sup>		---	3.5	7	
T <sub>d(off)</sub>	Turn-Off Delay Time <sup>2, 3</sup>		---	14	28	
T <sub>f</sub>	Fall Time		---	6	12	
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =10V, V <sub>GS</sub> =0V, F=1MHz	---	38.2	75	pF
C <sub>oss</sub>	Output Capacitance		---	14.4	28	
C <sub>rss</sub>	Reverse Transfer Capacitance		---	6	12	

### Drain-Source Diode Characteristics and Maximum Ratings

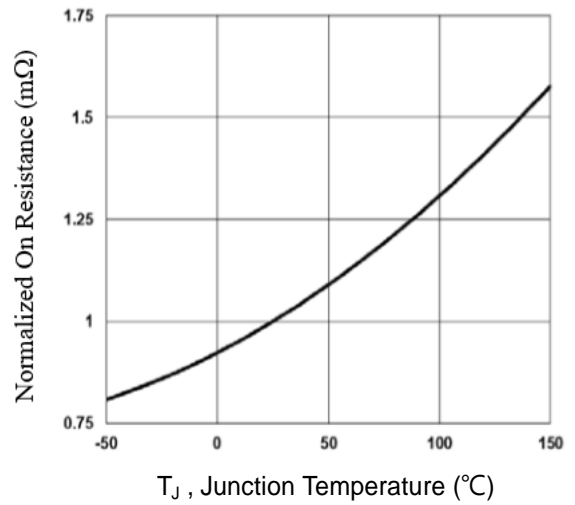
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I <sub>S</sub>	Continuous Source Current	V <sub>G</sub> =V <sub>D</sub> =0V, Force Current	---	---	0.8	A
I <sub>SM</sub>	Pulsed Source Current		---	---	1.6	A
V <sub>SD</sub>	Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =0.2A, T <sub>J</sub> =25°C	---	---	1	V

Note :

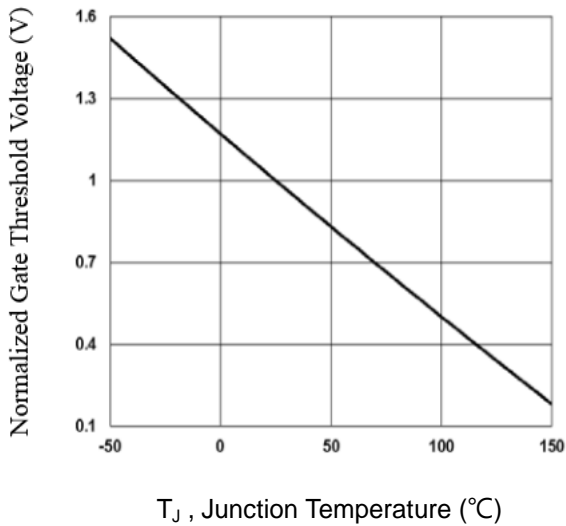
- 1.Repetitive Rating : Pulsed width limited by maximum junction temperature.
- 2.The data tested by pulsed, pulse width ≤ 300us, duty cycle ≤ 2%.
- 3.Essentially independent of operating temperature.



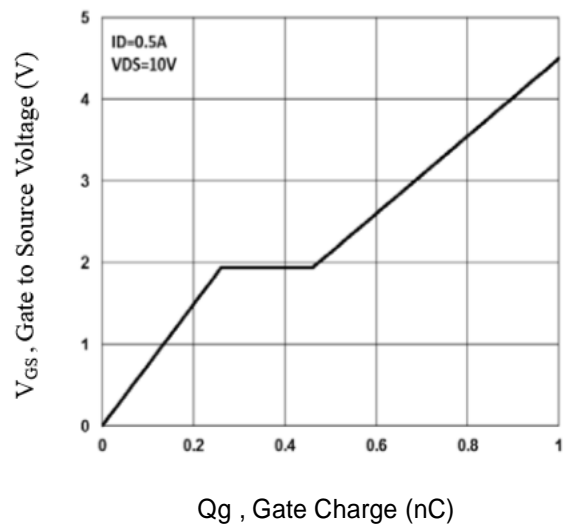
**Fig.1 Continuous Drain Current vs.  $T_c$**



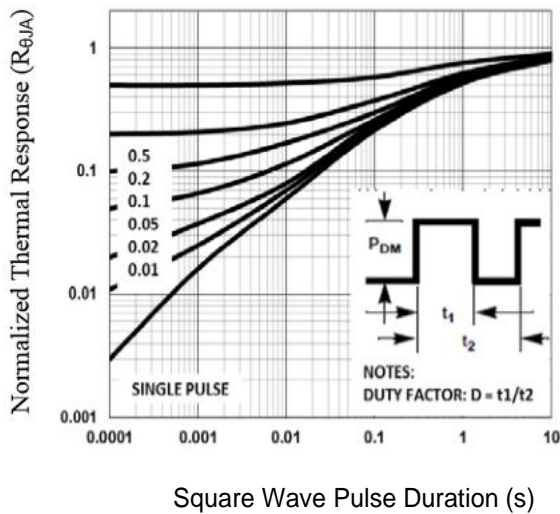
**Fig.2 Normalized  $R_{DS(on)}$  vs.  $T_j$**



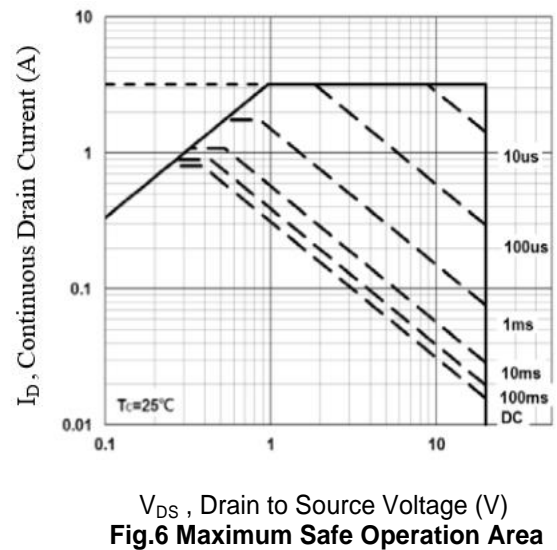
**Fig.3 Normalized  $V_{th}$  vs.  $T_j$**



**Fig.4 Gate Charge Waveform**



**Fig.5 Normalized Transient Impedance**



**Fig.6 Maximum Safe Operation Area**

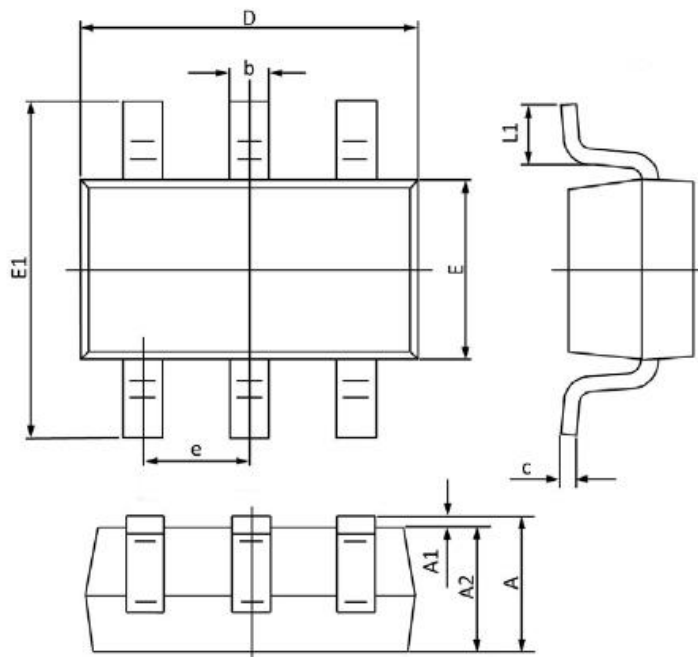
## Ordering Information

ECP2220Z XX X

R : Tape & Reel

BG = SOT363

## SOT363 Package Outline Dimension



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MAX	MIN	MAX	MIN
A	1.100	0.800	0.043	0.031
A1	0.100	0.000	0.004	0.000
A2	1.000	0.800	0.039	0.031
b	0.330	0.100	0.013	0.004
c	0.250	0.100	0.010	0.004
D	2.200	1.800	0.087	0.071
E	1.350	1.150	0.053	0.045
E1	2.400	1.800	0.094	0.071
e	0.65BSC		0.026BSC	
L1	0.350	0.100	0.014	0.004