## 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.

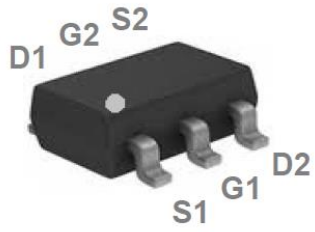
## Features

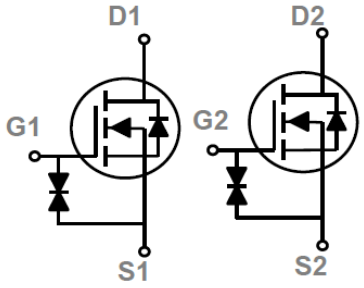
◆20V/0.8A, RDS(ON) = 300mΩ @ VGS = 4.5V
◆Suit for 1.5V Gate Drive Applications
◆Fast switching
◆G-S ESD protection diode embedded
◆SOT-363 package design

## Applications

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

## SOT-363 Dual Pin Configuration




## Absolute Maximum Ratings ($T_C$=25℃ Unless Otherwise Noted)

| Parameter | | Symbol | Maximum | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | 20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±8 | V |
| Continuous Drain Current | $T_C$ = 25℃ | $I_D$ | 0.8 | A |
| | $T_C$ = 100℃ | | 0.51 | |
| Pulsed Drain Current | | $I_{DM}$ | 3.2 | A |
| Power Dissipation | $T_A$ = 25℃ | $P_D$ | 275 | mW |
| | Derate above 25℃ | | 2.2 | mW/℃ |
| Operating junction temperature range | | $T_J$ | - 55 to 150 | °C |
| Storage temperature range | | $T_{STG}$ | - 55 to 150 | °C |

## Thermal Resistance Ratings

| Parameter | Symbol | Maximum | Unit |
|---|---|---|---|
| Junction-to-Ambient | $R_{\theta JA}$ | 450 | °C/W |

## Ordering Information

| Device | Package | REMARK |
|---|---|---|
| ECDEV2220Z | SOT-363 | 3000 pcs / Reel |

## Electrical Characteristics ($T_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| **Static Parameters** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$ = 0V, $I_D$ = 250μA | 20 | - | - | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{GS}$ = $V_{DS,}$ $I_D$ = 250μA | 0.3 | 0.6 | 1 | V |
| Gate Leakage Current | $I_{GSS}$ | $V_{DS}$ = 0V, $V_{GS}$ = ± 6 V | - | - | ±20 | uA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$ = 20V, $V_{GS}$ = 0V $T_J$ = 25 ℃ | - | - | 1 | μA |
| | | $V_{DS}$ =16V, $V_{GS}$ = 0V, $T_J$ = 125 ℃ | - | - | 10 | |
| Drain-Source On Resistance | $R_{DS(ON)}$ | $V_{GS}$ = 4.5V, $I_D$ = 0.5A | - | 200 | 300 | mΩ |
| | | $V_{GS}$ = 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 | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$ = 0.2A, $V_{GS}$ = 0V | - | - | 1 | V |
| **Dynamic Parameters** | | | | | | |
| Input Cap. | $C_{iss}$ | $V_{DS}$ = 10V, $V_{GS}$ = 0V, F = 1MH$_Z$ | - | 38.2 | 75 | pF |
| Output Cap. | $C_{oss}$ | | - | 14.4 | 28 | |
| Reverse Transfer Cap. | $C_{rss}$ | | - | 6 | 12 | |
| Total Gate Charge | $Q_g$ | $V_{DS}$ = 10V, $V_{GS}$ = 4.5V, $I_D$ =0.5A | - | 1 | 2 | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 0.26 | 0.5 | |
| Gate-Drain Charge | $Q_{gd}$ | | - | 0.2 | 0.4 | |
| Turn-On Time | $T_{D(ON)}$ | $V_{DS}$ = 10V, , $I_D$ = 0.5A, $V_{GS}$ = 4.5V, $R_G$ = 10Ω | - | 5 | 10 | nS |
| | $t_r$ | | - | 3.5 | 7 | |
| Turn-Off Time | $T_{D(OFF)}$ | | - | 14 | 28 | |
| | $t_f$ | | - | 6 | 12 | |

## Typical Characterictics

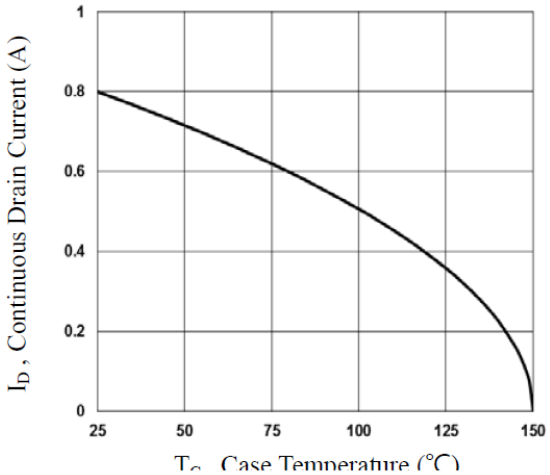



**Fig.1 Continuous Drain Current vs. $T_C$**

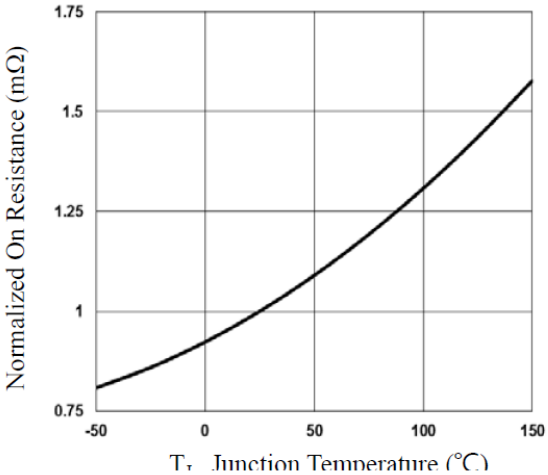



**Fig.2 Normalized RDSON vs. $T_J$**

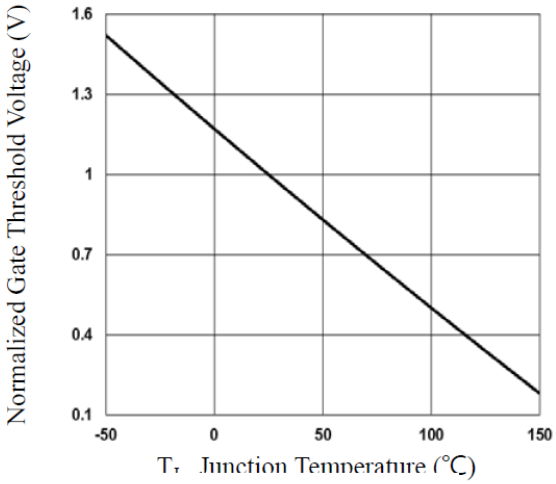



**Fig.3 Normalized $V_{th}$ vs. $T_J$**

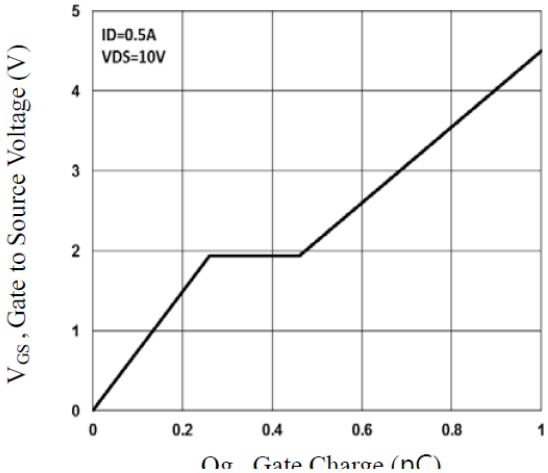



**Fig.4 Gate Charge Waveform**

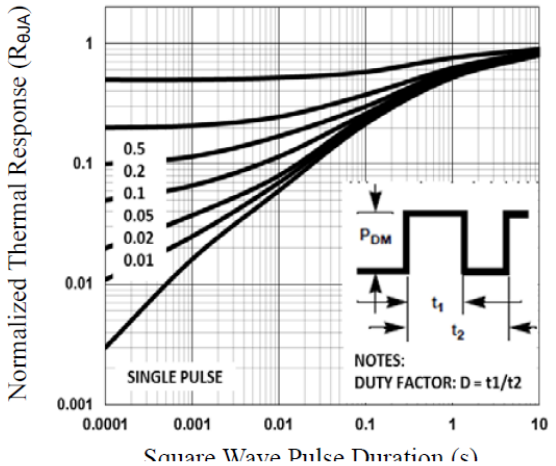



**Fig.5 Normalized Transient Impedance**

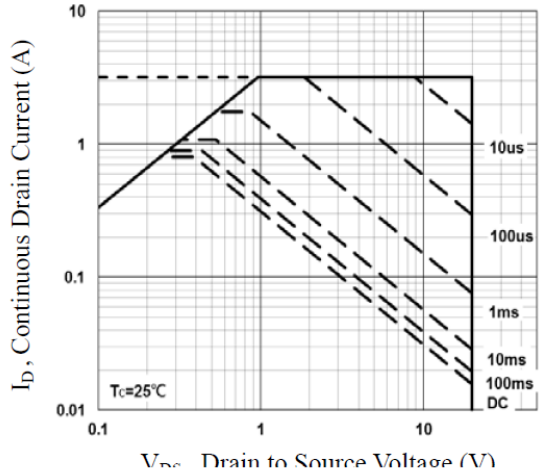
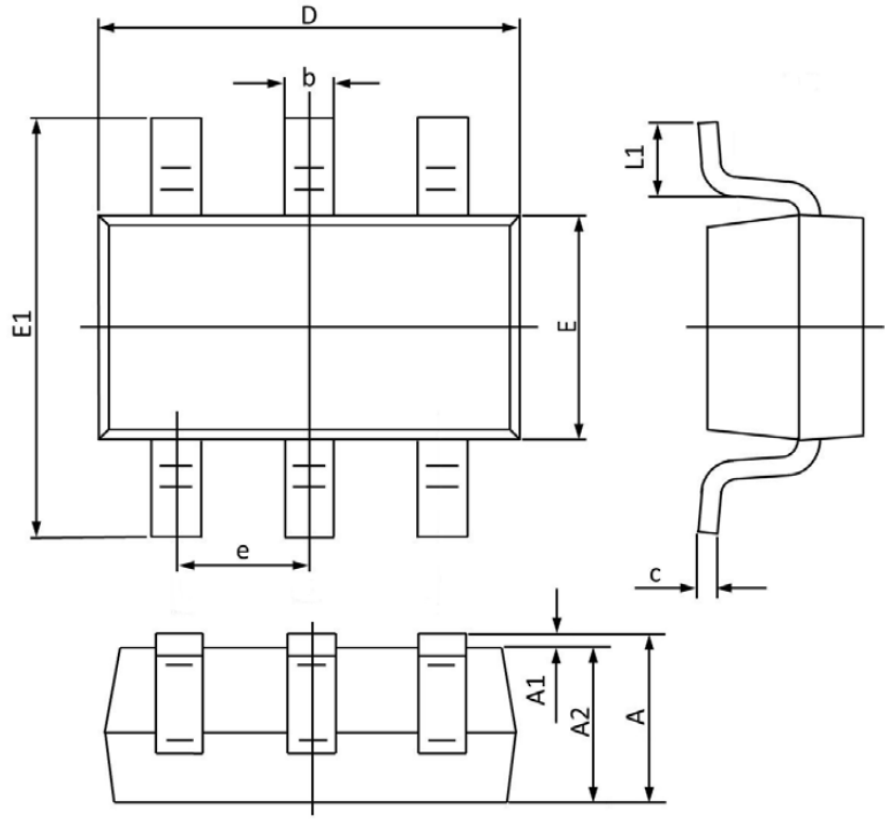



**Fig.6 Maximum Safe Operation Area**

## Physical Dimensions

**6Pin surface Mount SOT-363**




| 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 |