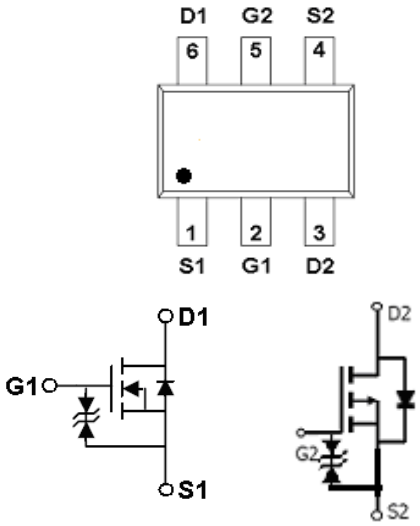
# SPC6333
## N & P Pair Enhancement Mode MOSFET

### DESCRIPTION
The SPC6333 is the N- and P-Channel enhancement mode power field effect transistors are produced using high cell density , DMOS trench technology. This high density process is especially tailored to minimize on-state resistance and provide superior switching performance. These devices are particularly suited for low voltage applications such as notebook computer power management and other battery powered circuits where high-side switching , low in-line power loss, and resistance to transients are needed.

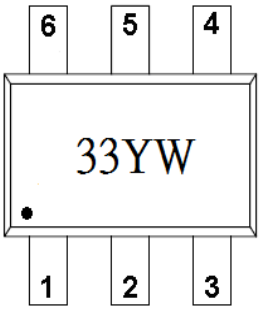
### APPLICATIONS
- Power Management in Note book
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC
- LCD Display inverter

### FEATURES
- N-Channel
  20V/0.95A,$R_{DS(ON)}$=380mΩ@$V_{GS}$=4.5V
  20V/0.75A,$R_{DS(ON)}$=450mΩ@$V_{GS}$=2.5V
  20V/0.65A,$R_{DS(ON)}$=800mΩ@$V_{GS}$=1.8V
- P-Channel
  -20V/0.45A,$R_{DS(ON)}$=520mΩ@$V_{GS}$=-4.5V
  -20V/0.35A,$R_{DS(ON)}$=700mΩ@$V_{GS}$=-2.5V
  -20V/0.25A,$R_{DS(ON)}$=1500mΩ@$V_{GS}$=-1.8V
- Super high density cell design for extremely low $R_{DS\ (ON)}$
- Exceptional on-resistance and maximum DC current capability
- ESD protected
- SOT-363 (SC-70-6L) package design

### PIN CONFIGURATION(SOT-363/SC-70-6L)




### PART MARKING




Y : Year Code
W: Week Code

# SPC6333
## N & P Pair Enhancement Mode MOSFET

**PIN DESCRIPTION**

| Pin | Symbol | Description |
|---|---|---|
| 1 | S1 | Source 1 |
| 2 | G1 | Gate 1 |
| 3 | D2 | Drain 2 |
| 4 | S2 | Source 2 |
| 5 | G2 | Gate 2 |
| 6 | D1 | Drain1 |

**ORDERING INFORMATION**

| Part Number | Package | Part Marking |
|---|---|---|
| SPC6333S36RGB | SOT-363 | 33 |

※ Week Code : A ~ Z( 1 ~ 26 ) ; a ~ z( 27 ~ 52 )
※ SPC6333S36RGB : Tape Reel ; Pb – Free ; Halogen -Free

**ABSOULTE MAXIMUM RATINGS**

($T_A$=25℃ Unless otherwise noted)

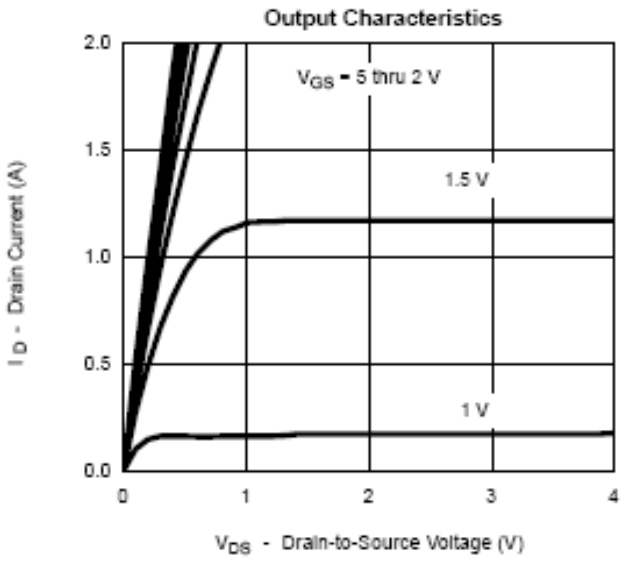
| Parameter | | Symbol | Typical | | Unit |
|---|---|---|---|---|---|
| | | | N-Channel | P-Channel | |
| Drain-Source Voltage | | $V_{DSS}$ | 20 | -20 | V |
| Gate –Source Voltage | | $V_{GSS}$ | ±12 | ±12 | V |
| Continuous Drain Current($T_J$=150℃) | $T_A$=25℃ | $I_D$ | 1.2 | -1.0 | A |
| | $T_A$=80℃ | | 0.9 | -0.7 | |
| Pulsed Drain Current | | $I_{DM}$ | 4 | -3 | A |
| Continuous Source Current(Diode Conduction) | | $I_S$ | 0.6 | -0.6 | A |
| Power Dissipation | $T_A$=25℃ | $P_D$ | 0.3 | | W |
| | $T_A$=70℃ | | 0.19 | | |
| Operating Junction Temperature | | $T_J$ | -55/150 | | ℃ |
| Storage Temperature Range | | $T_{STG}$ | -55/150 | | ℃ |
| Thermal Resistance-Junction to Ambient | T ≤ 10sec | $R_{\theta JA}$ | 360 | 360 | ℃/W |
| | Steady State | | 400 | 400 | |

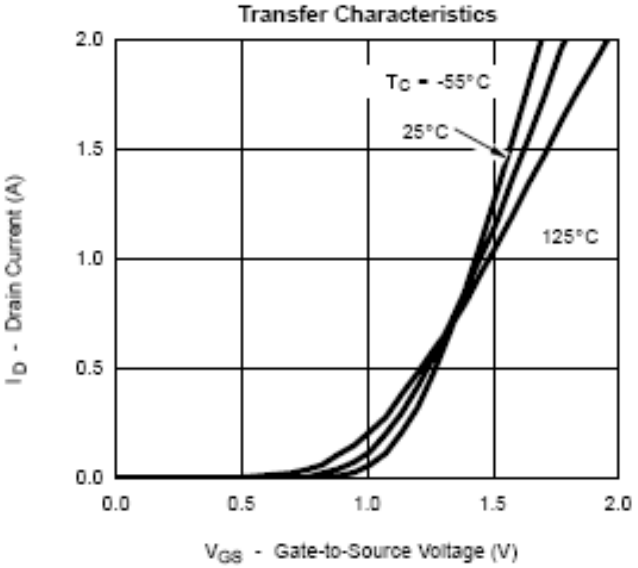
## ELECTRICAL CHARACTERISTICS

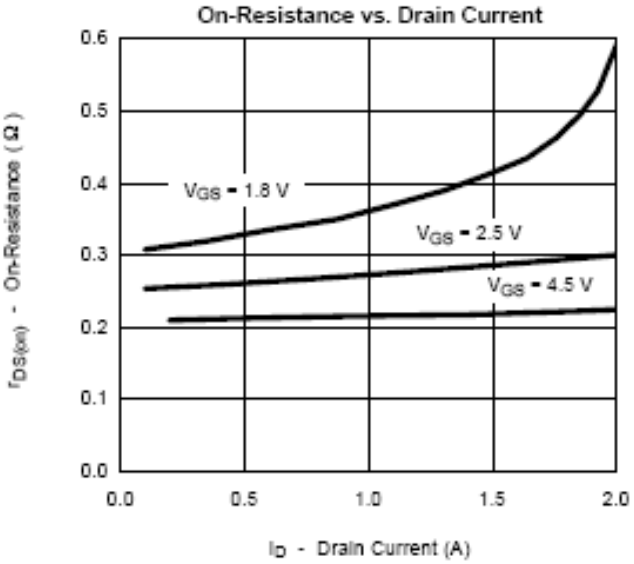
($T_A$=25℃ Unless otherwise noted)

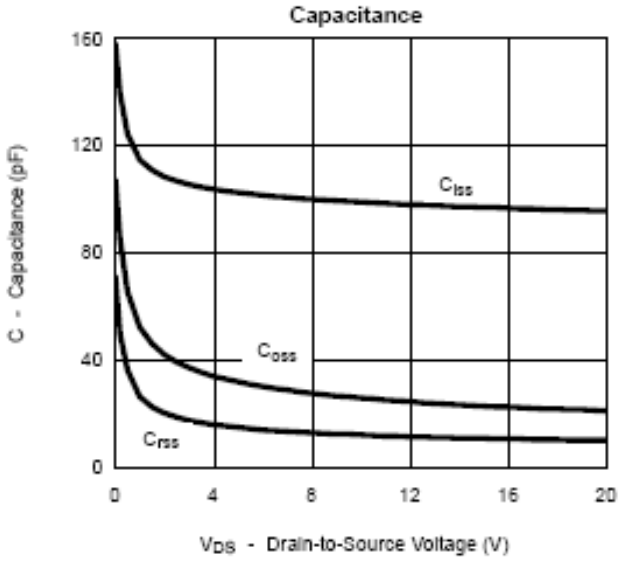
| Parameter | Symbol | Conditions | | Min. | Typ | Max. | Unit |
|---|---|---|---|---|---|---|---|
| **Static** | | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS}$=0V,$I_D$=250uA | N-Ch | 20 | | | V |
| | | $V_{GS}$=0V,$I_D$=-250uA | P-Ch | -20 | | | |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=250uA | N-Ch | 0.35 | | 1.0 | |
| | | $V_{DS}$=$V_{GS}$,$I_D$=-250uA | P-Ch | -0.35 | | -1.0 | |
| Gate Leakage Current | $I_{GSS}$ | $V_{DS}$=0V,$V_{GS}$=±12V | N-Ch | | | 10 | uA |
| | | $V_{DS}$=0V,$V_{GS}$=±12V | P-Ch | | | -10 | |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=20V,$V_{GS}$=0V | N-Ch | | | 1 | uA |
| | | $V_{DS}$=-20V,$V_{GS}$=0V | P-Ch | | | -1 | |
| | | $V_{DS}$=20V,$V_{GS}$=0V $T_J$=55℃ | N-Ch | | | 5 | |
| | | $V_{DS}$=-20V,$V_{GS}$=0V $T_J$=55℃ | P-Ch | | | -5 | |
| On-State Drain Current | $I_{D(on)}$ | $V_{DS}$≥ 4.5V,$V_{GS}$=5V | N-Ch | 2 | | | A |
| | | $V_{DS}$≤ -4.5V,$V_{GS}$=-5V | P-Ch | -2 | | | |
| Drain-Source On-Resistance | $R_{DS(on)}$ | $V_{GS}$=4.5V,$I_D$=0.95A | N-Ch | | 0.26 | 0.38 | Ω |
| | | $V_{GS}$=-4.5V,$I_D$=-0.45A | P-Ch | | 0.42 | 0.52 | |
| | | $V_{GS}$=2.5V,$I_D$=0.75A | N-Ch | | 0.32 | 0.45 | |
| | | $V_{GS}$=-2.5V,$I_D$=-0.35A | P-Ch | | 0.58 | 0.70 | |
| | | $V_{GS}$=1.8V,$I_D$=0.65A | N-Ch | | 0.42 | 0.80 | |
| | | $V_{GS}$=-1.8V,$I_D$=-0.25A | P-Ch | | 0.95 | 1.5 | |
| Forward Transconductance | gfs | $V_{DS}$=10V,$I_D$=1.2A | N-Ch | | 2.6 | | S |
| | | $V_{DS}$=-10V,$I_D$=-1.0A | P-Ch | | 1.5 | | |
| Diode Forward Voltage | $V_{SD}$ | $I_S$=0.5A,$V_{GS}$=0V | N-Ch | | 0.8 | 1.2 | V |
| | | $I_S$=-0.5A,$V_{GS}$=0V | P-Ch | | -0.8 | -1.2 | |
| **Dynamic** | | | | | | | |
| Total Gate Charge | $Q_g$ | N-Channel $V_{DS}$=10V,$V_{GS}$=4.5V, $I_D$=1.2A P-Channel $V_{DS}$=-10V,$V_{GS}$=-4.5V ,$I_D$=-1.0A | N-Ch | | 1.2 | 2.0 | nC |
| | | | P-Ch | | 1.1 | 1.8 | |
| Gate-Source Charge | $Q_{gs}$ | | N-Ch | | 0.2 | | |
| | | | P-Ch | | 0.3 | | |
| Gate-Drain Charge | $Q_{gd}$ | | N-Ch | | 0.3 | | |
| | | | P-Ch | | 0.2 | | |
| Turn-On Time | $t_{d(on)}$ | N-Channel $V_{DD}$=10V,$R_L$=20Ω ,$I_D$=0.5A $V_{GEN}$=4.5V ,$R_G$=6Ω P-Channel $V_{DD}$=-10V,$R_L$=20Ω ,$I_D$=-0.5A $V_{GEN}$=-4.5V ,$R_G$=6Ω | N-Ch | | 15 | 25 | nS |
| | | | P-Ch | | 18 | 30 | |
| | $t_r$ | | N-Ch | | 20 | 30 | |
| | | | P-Ch | | 25 | 40 | |
| Turn-Off Time | $t_{d(off)}$ | | N-Ch | | 25 | 40 | |
| | | | P-Ch | | 20 | 30 | |
| | $t_f$ | | N-Ch | | 12 | 20 | |
| | | | P-Ch | | 12 | 20 | |

**TYPICAL CHARACTERISTICS ( N-Channel )**



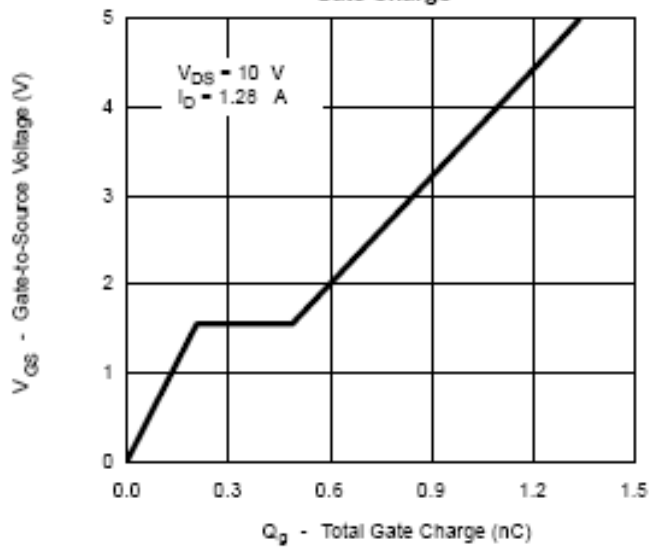



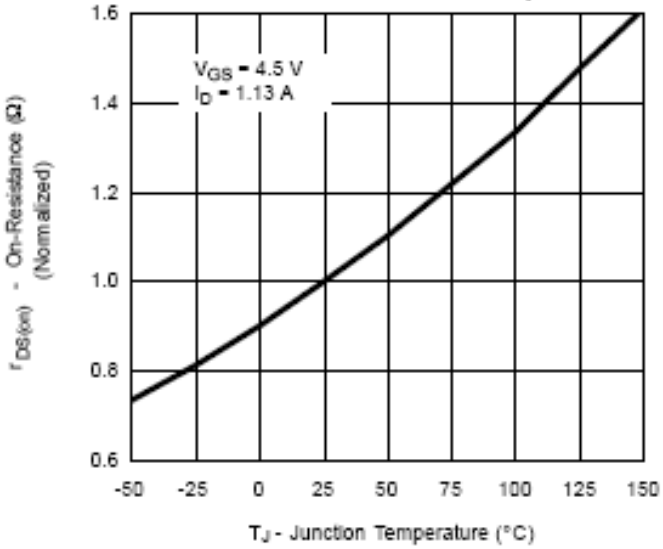



**TYPICAL CHARACTERISTICS ( N-Channel )**

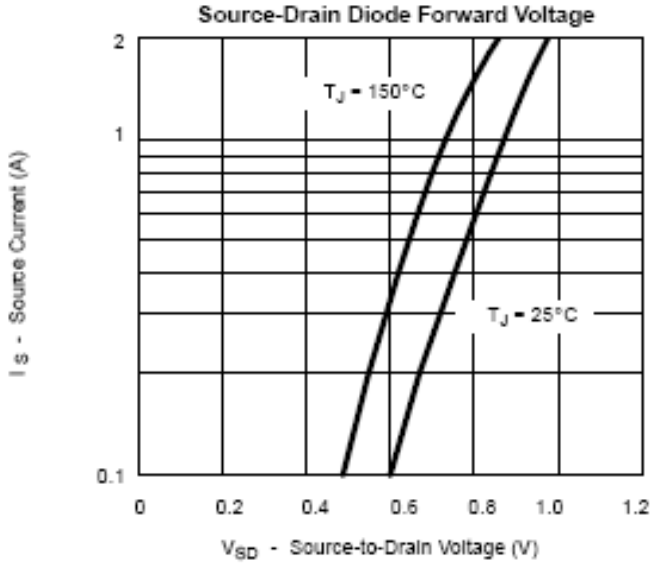
Gate Charge



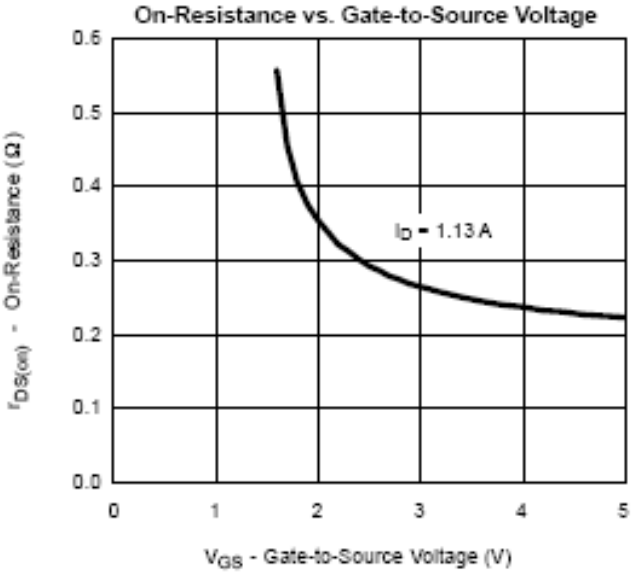

On-Resistance vs. Junction Temperature



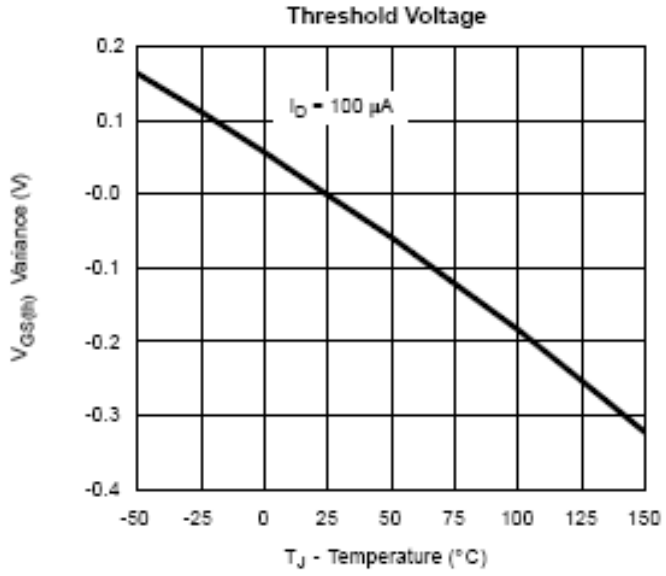

Source-Drain Diode Forward Voltage

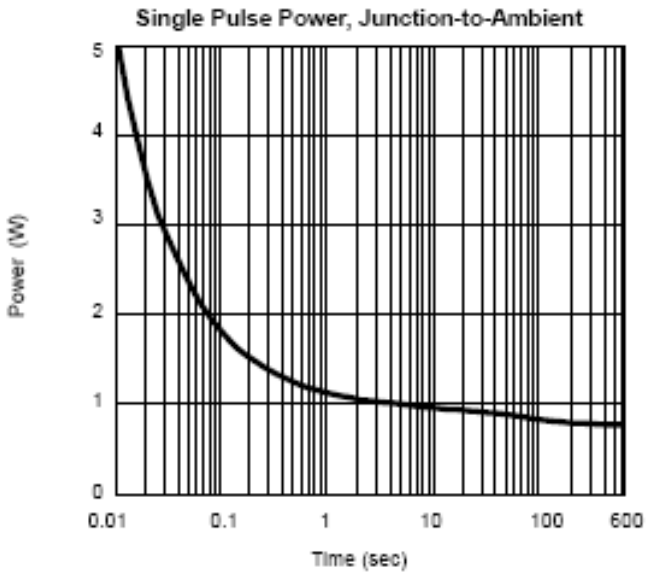


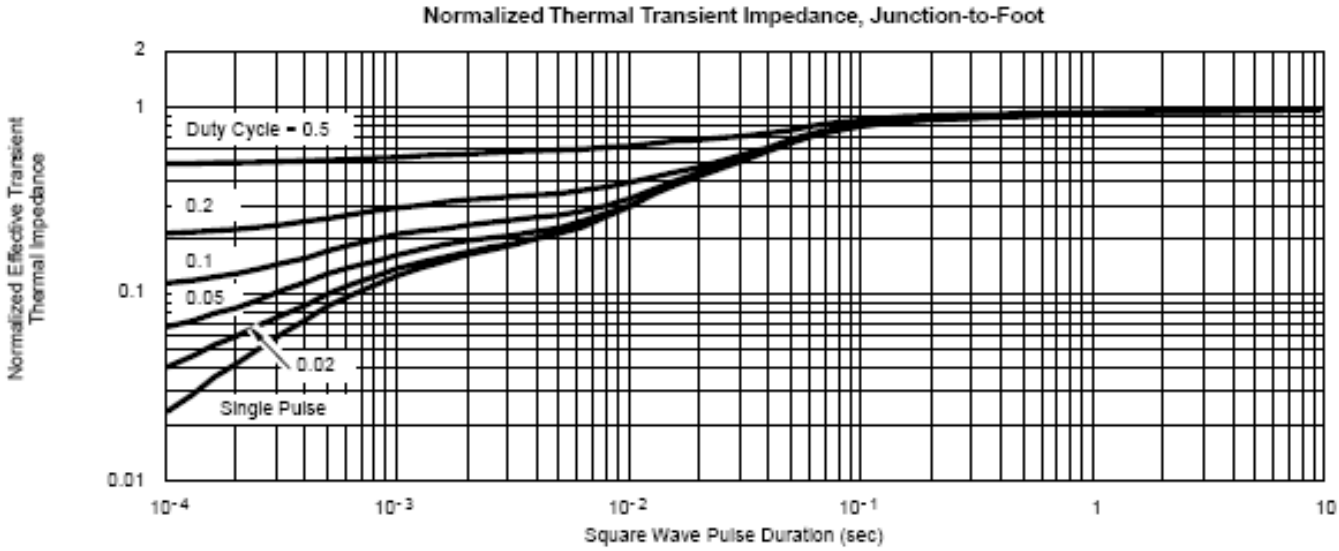

On-Resistance vs. Gate-to-Source Voltage



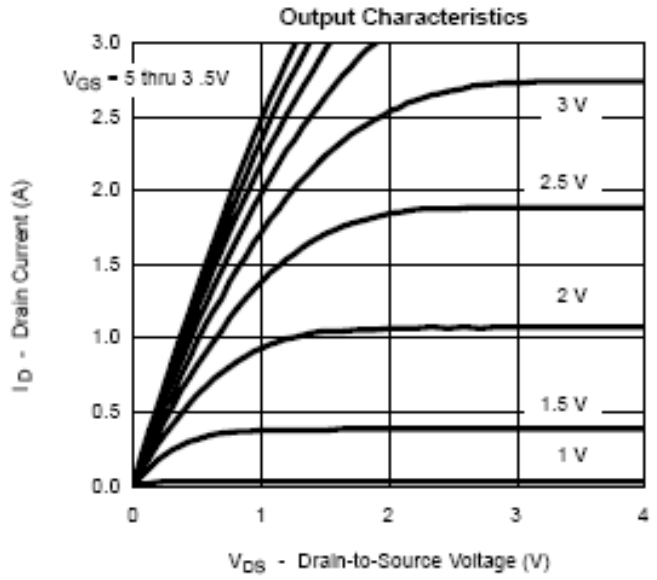
**TYPICAL CHARACTERISTICS ( N-Channel )**

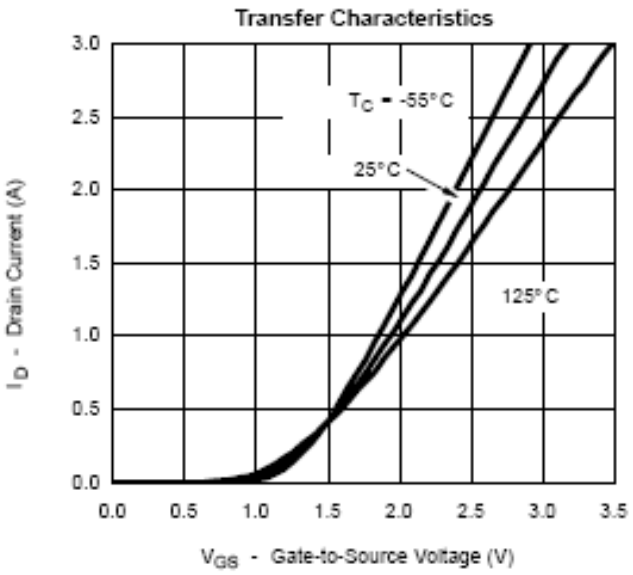


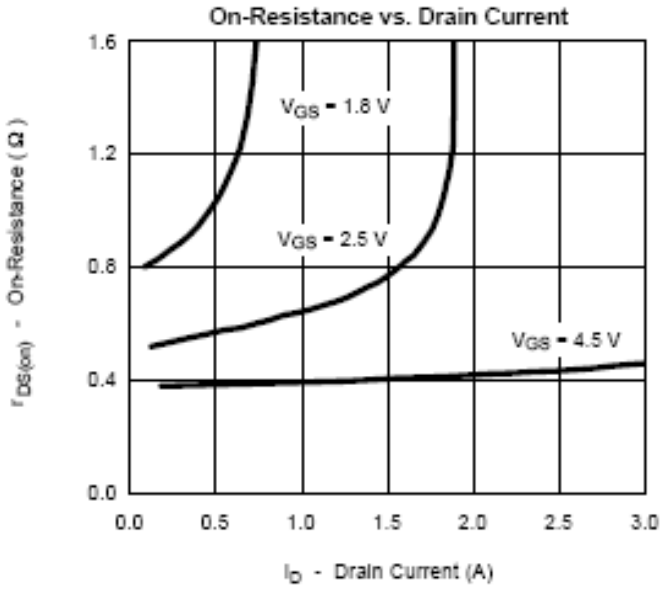



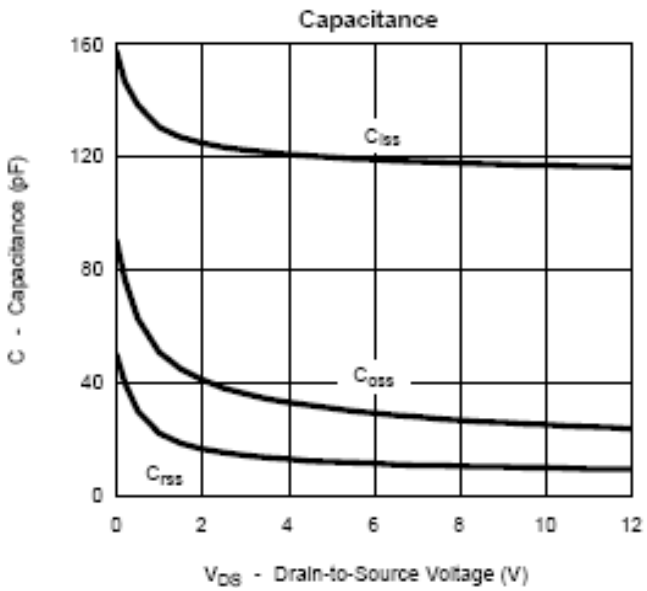



**TYPICAL CHARACTERISTICS ( P-Channel )**

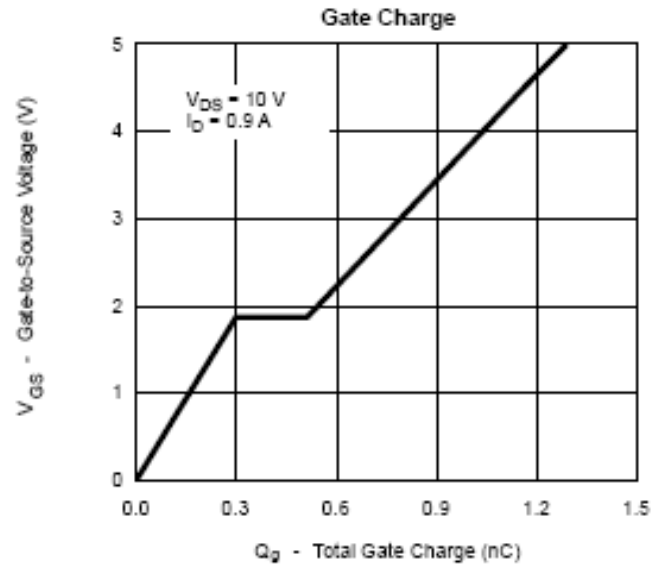


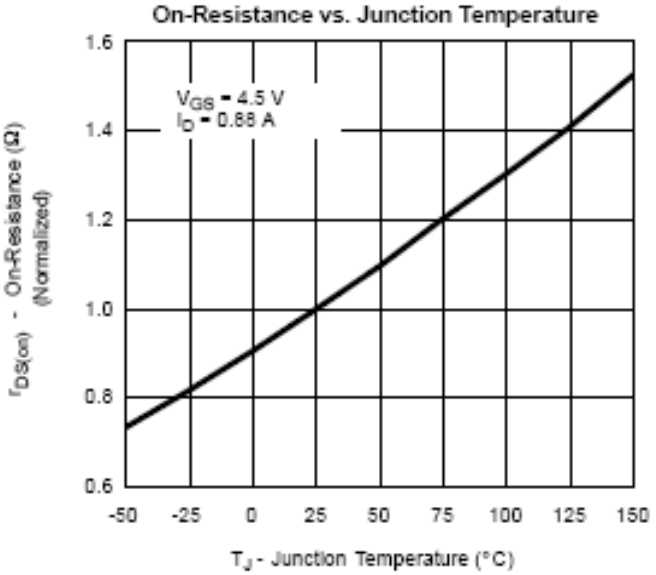



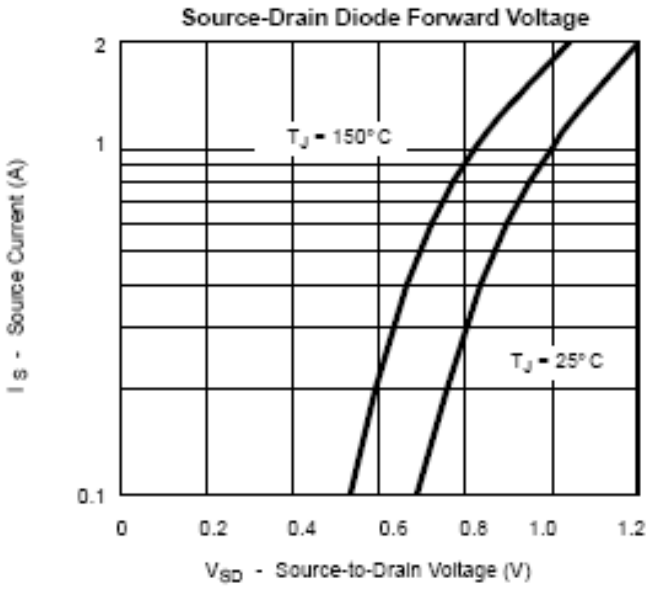



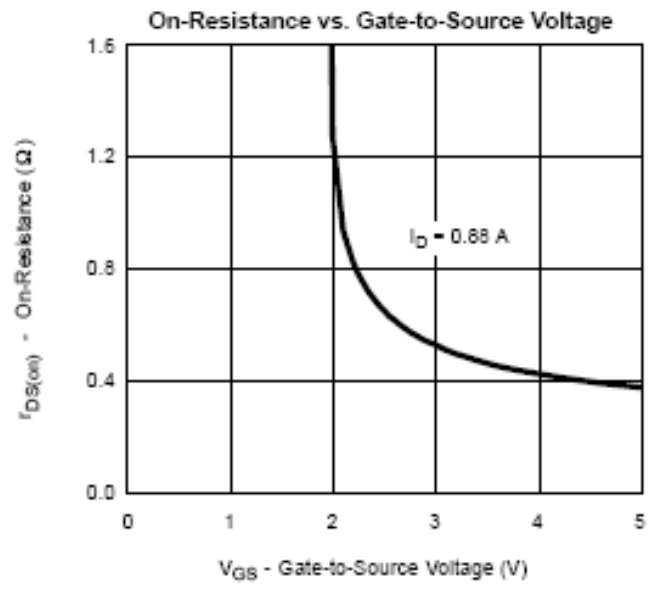



**TYPICAL CHARACTERISTICS ( P-Channel )**

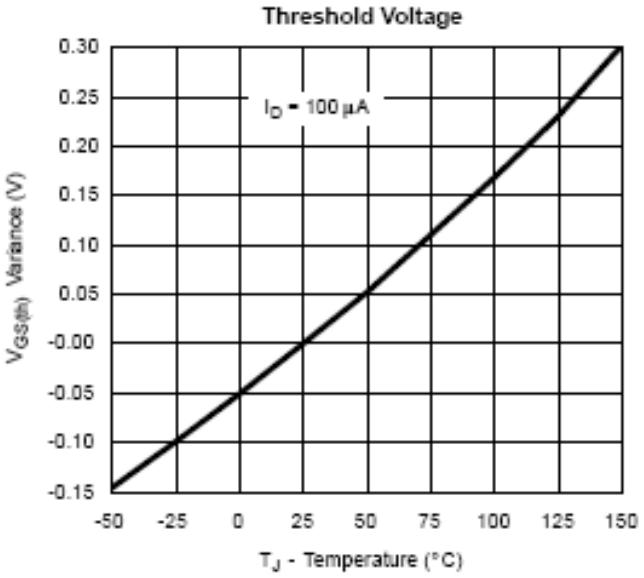


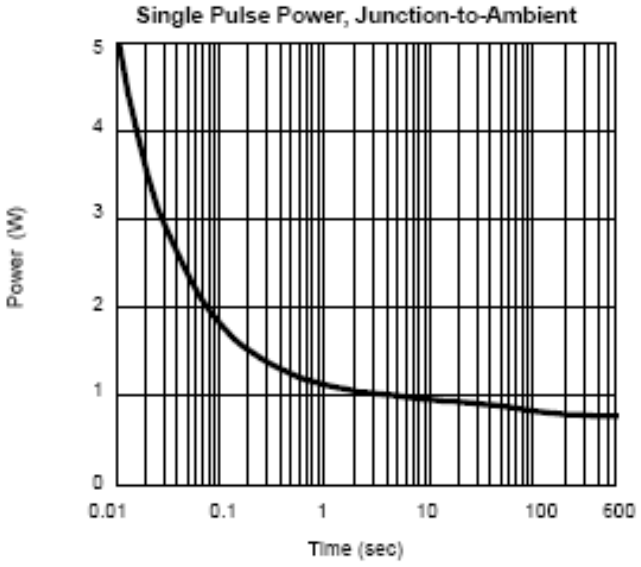



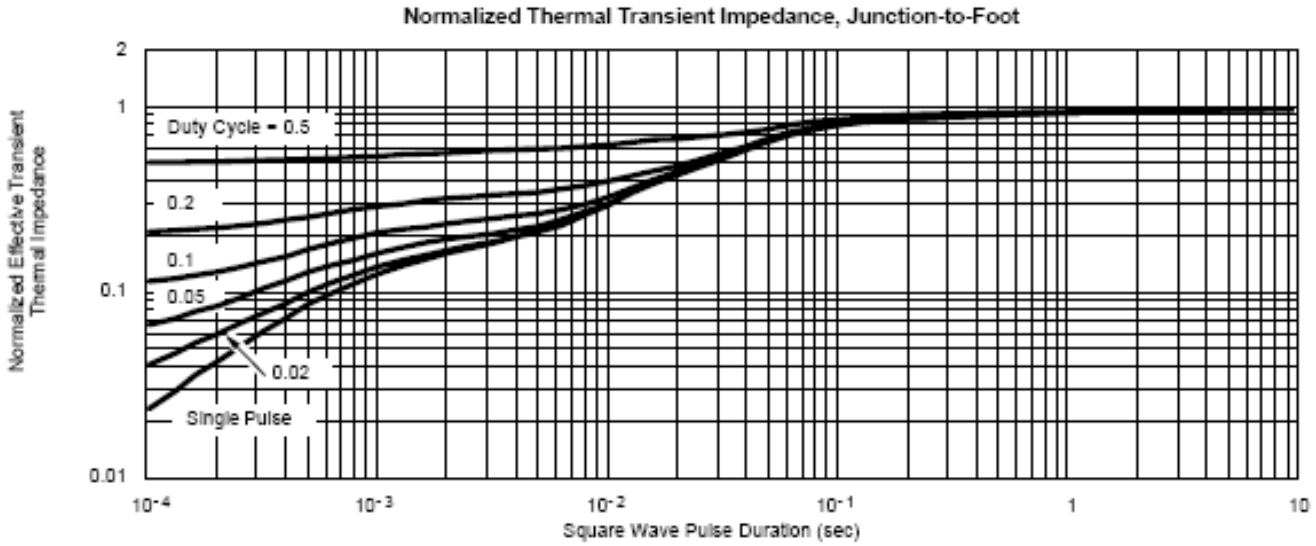



**TYPICAL CHARACTERISTICS ( P-Channel )**



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