

GSM6601

30V N & P Pair Enhancement Mode MOSFET

Product Description

GSM6601, N & P Pair enhancement mode MOSFET, uses Advanced Trench Technology to provide excellent $R_{DS(ON)}$, low gate charge.

These devices are particularly suited for low voltage power management, and low in-line power loss are needed in commercial industrial surface mount applications.

Features

- N-Channel
30V/3.4A, $R_{DS(ON)}=68m\Omega@V_{GS}=10V$
30V/3.0A, $R_{DS(ON)}=74m\Omega@V_{GS}=4.5V$
30V/2.0A, $R_{DS(ON)}=90m\Omega@V_{GS}=2.5V$
- P-Channel
-30V/-2.6A, $R_{DS(ON)}=115m\Omega@V_{GS}=-10V$
-30V/-2.0A, $R_{DS(ON)}=150m\Omega@V_{GS}=-4.5V$
-30V/-1.2A, $R_{DS(ON)}=235m\Omega@V_{GS}=-2.5V$
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- TSOP-6 package design

Applications

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

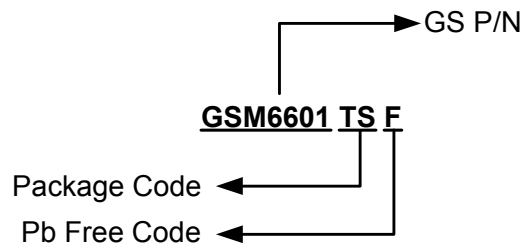
Packages & Pin Assignments

| GSM6601TSF (TSOP-6) | | |
|---------------------|--------|-------------|
| | | |
| Pin | Symbol | Description |
| 1 | G1 | Gate 1 |
| 2 | S2 | Source 2 |
| 3 | G2 | Gate 2 |
| 4 | D2 | Drain 2 |
| 5 | S1 | Source 1 |
| 6 | D1 | Drain 1 |

n-channel

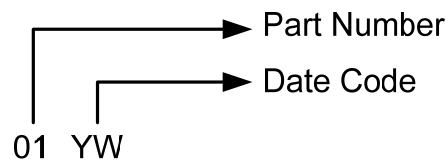
p-channel

Ordering Information



| Part Number | Package | Quantity Reel |
|-------------|---------|---------------|
| GSM6601TSF | TSOP-6 | 3000 PCS |

Marking Information



Absolute Maximum Ratings

T_A=25°C Unless otherwise noted

| Symbol | Parameter | Typical | | Unit | |
|------------------|--|----------------------|-----------|------|---|
| | | N-Channel | P-Channel | | |
| V _{DSS} | Drain-Source Voltage | 30 | -30 | V | |
| V _{GSS} | Gate –Source Voltage | ±20 | ±12 | V | |
| I _D | Continuous Drain Current (T _J =150°C) | T _A =25°C | 3.0 | -2.6 | A |
| | | T _A =70°C | 1.2 | -1.2 | |
| I _{DM} | Pulsed Drain Current | 15 | -15 | A | |
| I _S | Continuous Source Current (Diode Conduction) | 1.5 | -1.5 | A | |
| P _D | Power Dissipation | T _A =25°C | 2 | W | |
| | | T _A =70°C | 1.3 | | |
| T _J | Operating Junction Temperature | 150 | | °C | |
| T _{STG} | Storage Temperature Range | -55/150 | | °C | |
| R _{θJA} | Thermal Resistance-Junction to Ambient | 120 | | °C/W | |

Electrical Characteristics (N-Channel)

(T_A=25°C unless otherwise noted)

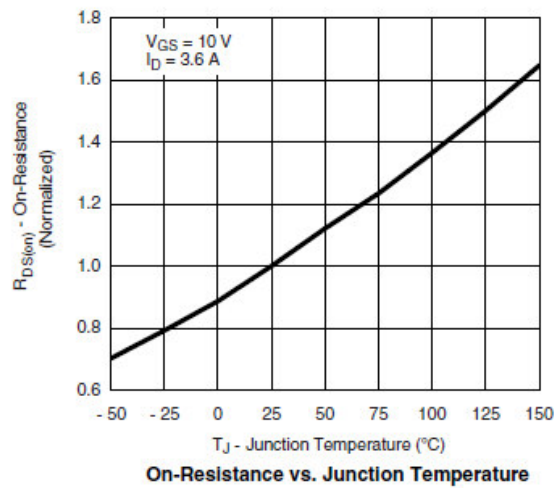
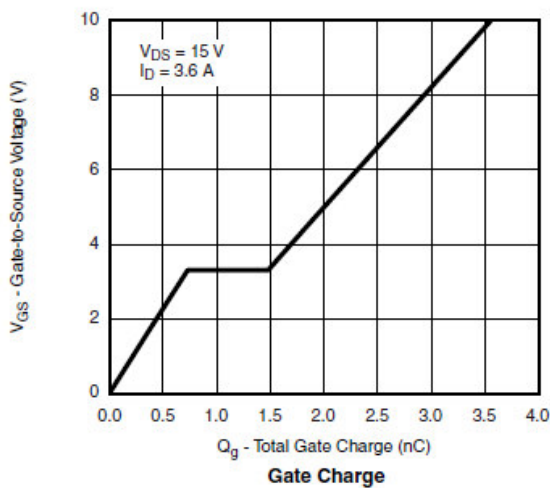
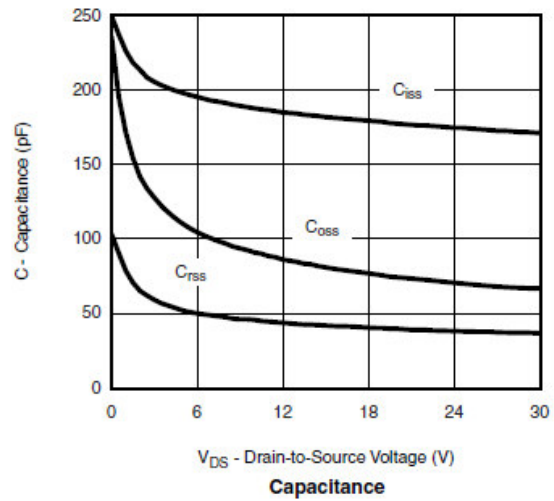
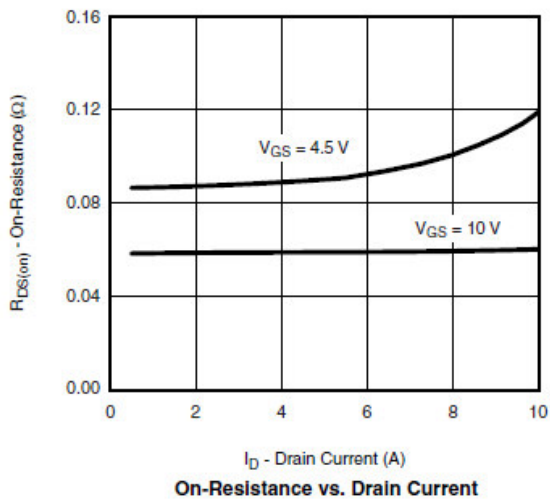
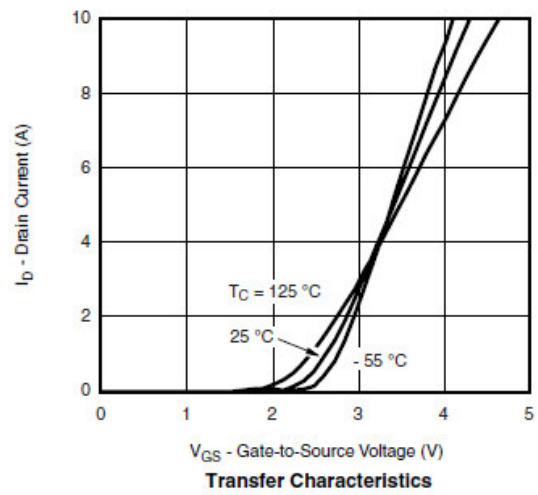
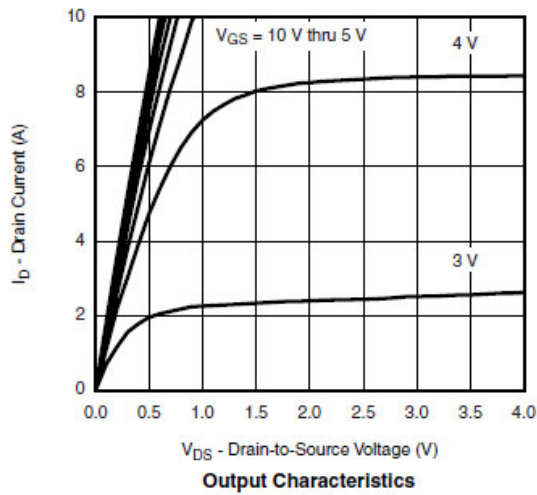
| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------------|---------------------------------|--|-----|-----|------|------|
| Static | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =250μA | 30 | | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =250μA | 0.3 | | 1.0 | V |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±12V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =24V, V _{GS} =0V | | | 1 | μA |
| | | V _{DS} =24V, V _{GS} =0V, T _J =85°C | | | 30 | |
| I _{D(on)} | On-State Drain Current | V _{DS} ≥5V, V _{GS} =4.5V | 30 | | | A |
| R _{DS(on)} | Drain-Source On-Resistance | V _{GS} =10V, I _D =3.4A | | 58 | 68 | mΩ |
| | | V _{GS} =4.5V, I _D =3.0A | | 62 | 74 | |
| | | V _{GS} =2.5V, I _D =2.0A | | 76 | 90 | |
| g _{FS} | Forward Transconductance | V _{DS} =10V, I _D =1.6A | | 20 | | S |
| V _{SD} | Diode Forward Voltage | I _S =1.7A, V _{GS} =0V | | 0.8 | 1.2 | V |
| Dynamic | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =15V, V _{GS} =0V, f=1MHz | | 280 | | pF |
| C _{oss} | Output Capacitance | | | 40 | | |
| C _{rss} | Reverse Transfer Capacitance | | | 20 | | |
| Q _g | Total Gate Charge | V _{DS} =15V, V _{GS} =4.5V, I _D =3.6A | | 2.3 | 3 | nC |
| Q _{gs} | Gate-Source Charge | | | 1.0 | | |
| Q _{gd} | Gate-Drain Charge | | | 0.6 | | |
| t _{d(on)} | Turn-On Time | V _{DD} =15V, R _L =15Ω, I _D =1.0A, V _{GEN} =10V, R _G =6Ω | | 10 | 15 | ns |
| T _r | | | | 12 | 20 | |
| t _{d(off)} | Turn-Off Time | | | 15 | 25 | |
| T _f | | | | 10 | 15 | |

Electrical Characteristics (P-Channel)

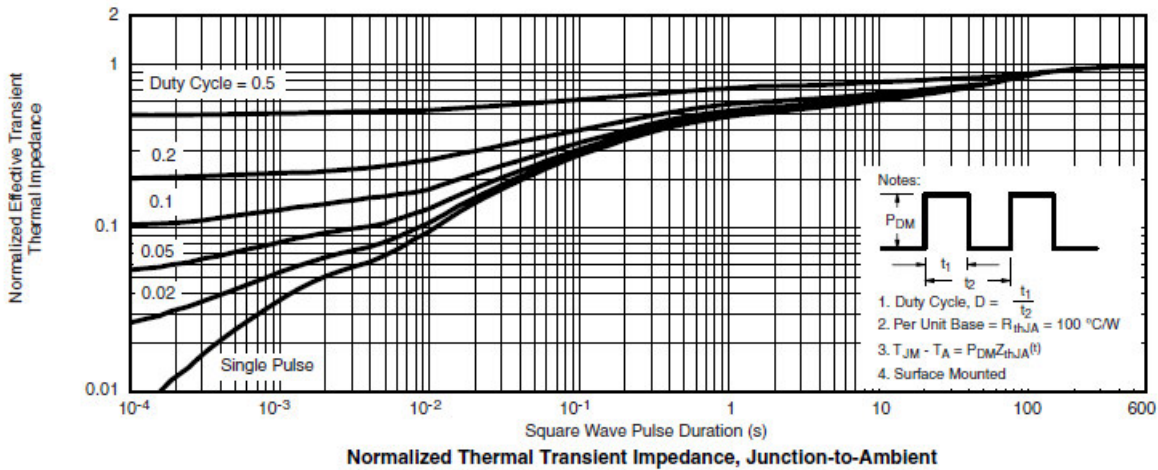
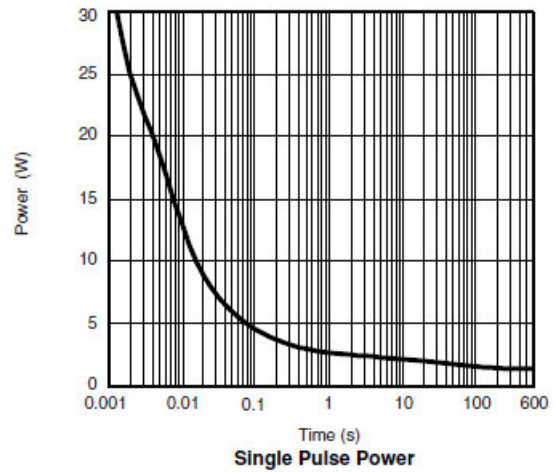
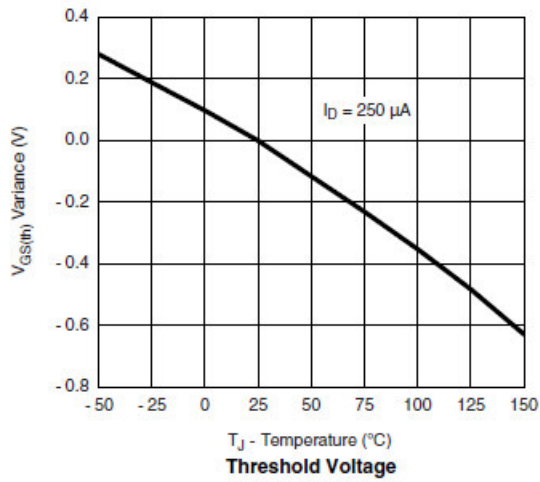
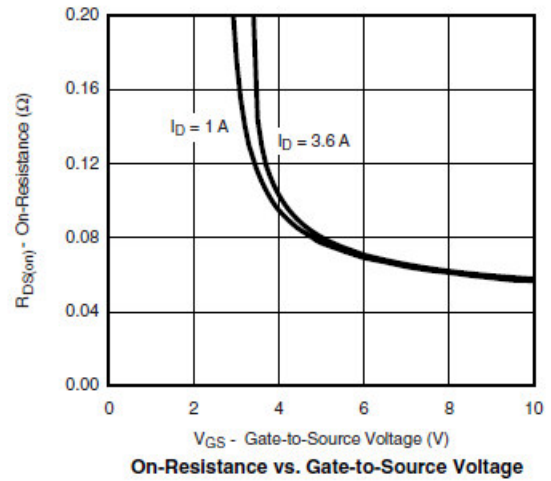
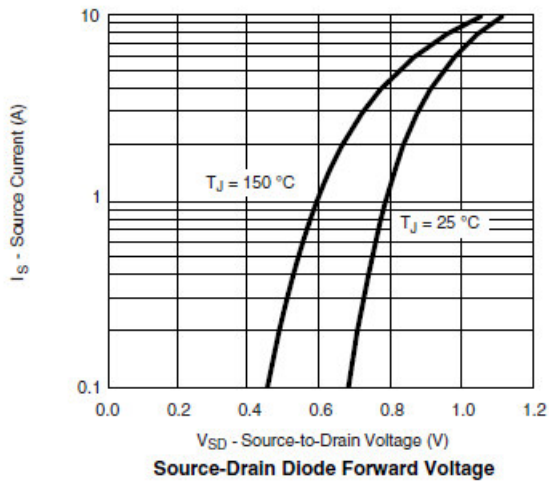
(T_A=25°C unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Unit |
|----------------------|---------------------------------|---|------|------|------|------|
| Static | | | | | | |
| V _{(BR)DSS} | Drain-Source Breakdown Voltage | V _{GS} =0V, I _D =-250uA | -30 | | | V |
| V _{GS(th)} | Gate Threshold Voltage | V _{DS} =V _{GS} , I _D =-250uA | -0.6 | | -1.4 | |
| I _{GSS} | Gate Leakage Current | V _{DS} =0V, V _{GS} =±12V | | | ±100 | nA |
| I _{DSS} | Zero Gate Voltage Drain Current | V _{DS} =-24V, V _{GS} =0V | | | -1 | uA |
| | | V _{DS} =-24V, V _{GS} =0V, T _J =85°C | | | -30 | |
| I _{D(on)} | On-State Drain Current | V _{DS} ≤ -5V, V _{GS} =-10V | -10 | | | A |
| R _{DS(on)} | Drain-Source On-Resistance | V _{GS} =-10.0V, I _D =-2.6A | | 102 | 115 | mΩ |
| | | V _{GS} =-4.5V, I _D =-2.0A | | 132 | 150 | |
| | | V _{GS} =-2.5V, I _D =-1.2A | | 218 | 235 | |
| g _{FS} | Forward Transconductance | V _{DS} =-5V, I _D =-4.0A | | 10 | | S |
| V _{SD} | Diode Forward Voltage | I _S =-1.7A, V _{GS} =0V | | -0.7 | -1.3 | V |
| Dynamic | | | | | | |
| C _{iss} | Input Capacitance | V _{DS} =-15V, V _{GS} =0V, f=1MHz | | 230 | | pF |
| C _{oss} | Output Capacitance | | | 40 | | |
| C _{rss} | Reverse Transfer Capacitance | | | 25 | | |
| Q _g | Total Gate Charge | V _{DS} =-15V, V _{GS} =-4.5V, I _D =-2.0A | | 4 | 6 | nC |
| Q _{gs} | Gate-Source Charge | | | 0.6 | | |
| Q _{gd} | Gate-Drain Charge | | | 1.5 | | |
| t _{d(on)} | Turn-On Time | V _{DD} =-15V, R _L =15Ω, I _D =-1.0A, V _{GEN} =-10V, R _G =6Ω | | 5 | 10 | ns |
| T _r | | | | 8 | 15 | |
| t _{d(off)} | Turn-Off Time | | | 15 | 30 | |
| T _f | | | | 15 | 30 | |

Typical Performance Characteristics (N-Channel)

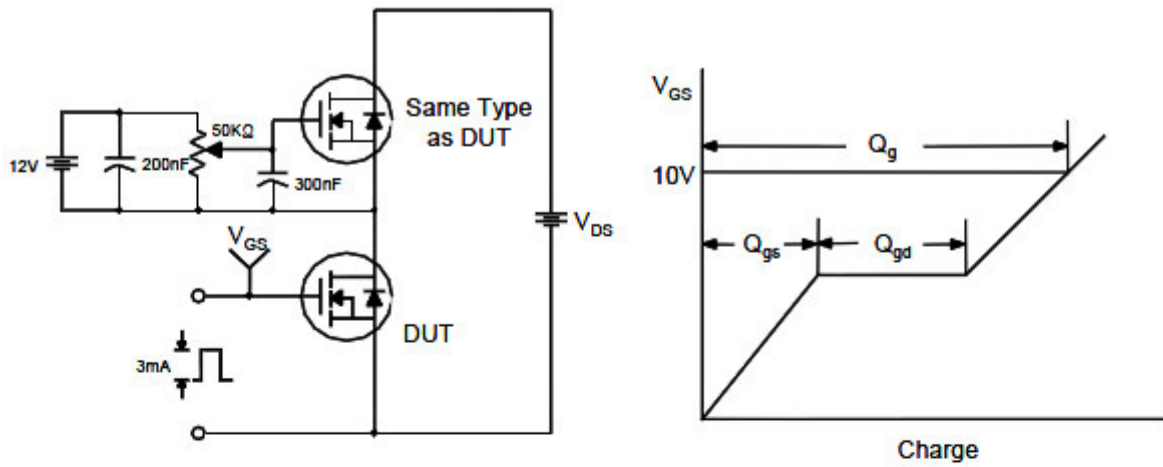


Typical Performance Characteristics (N-Channel Continue)

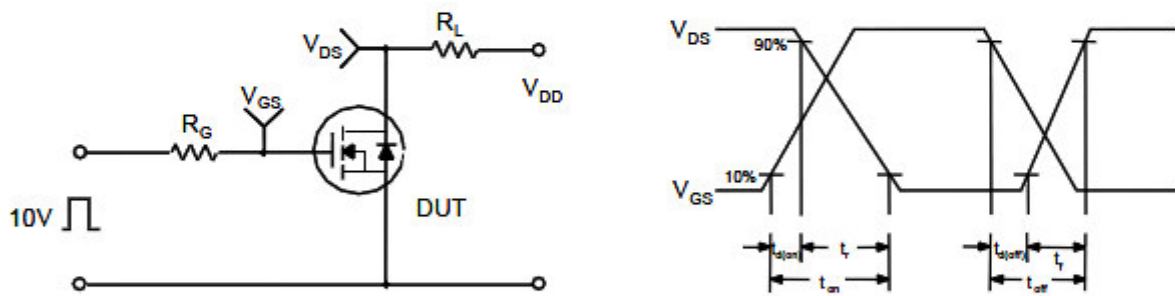


Typical Performance Characteristics (N-Channel Continue)

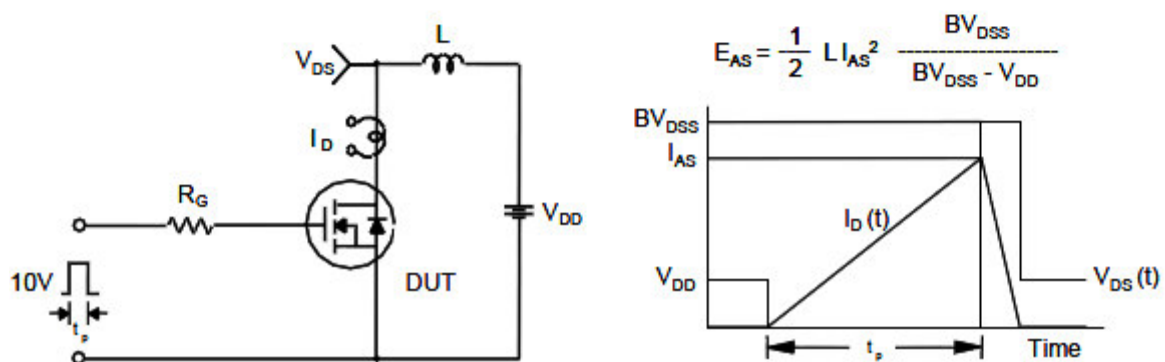
Gate Charge Test Circuit & Waveform



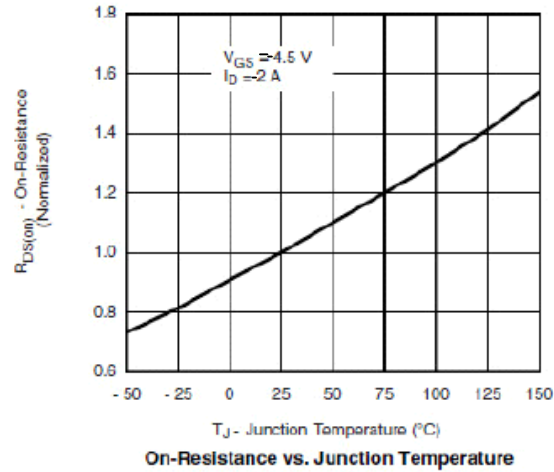
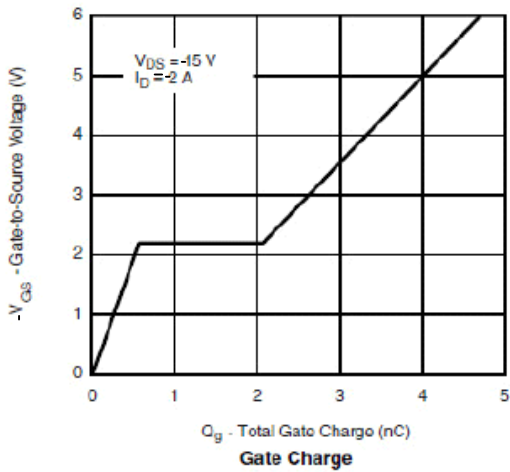
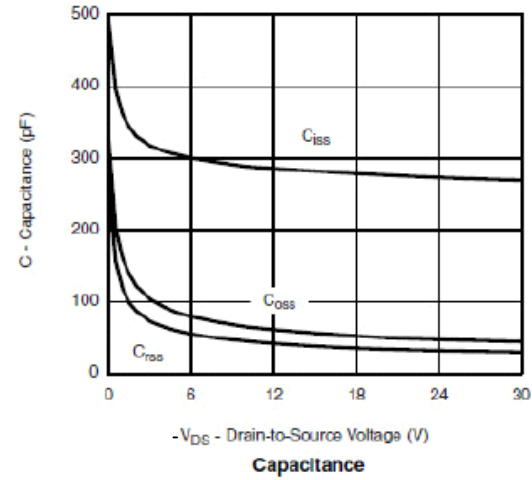
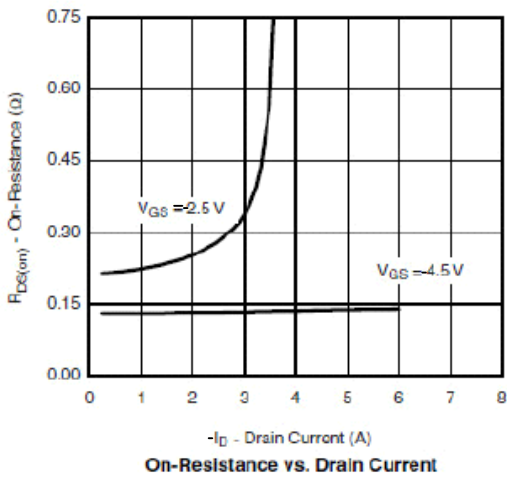
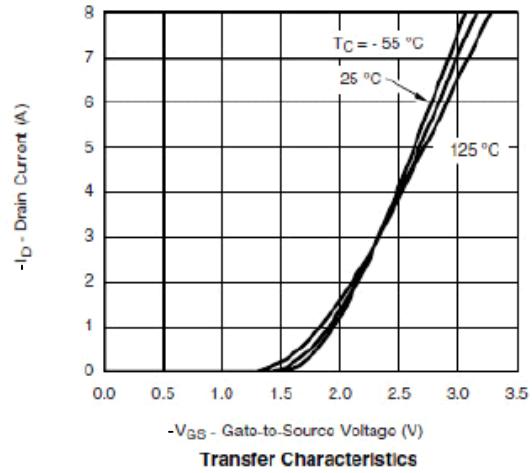
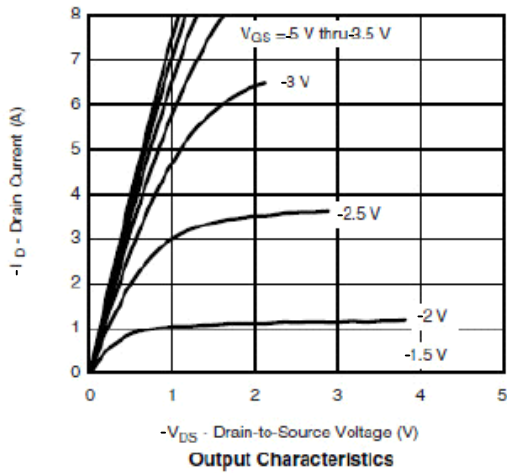
Resistive Switching Test Circuit & Waveforms



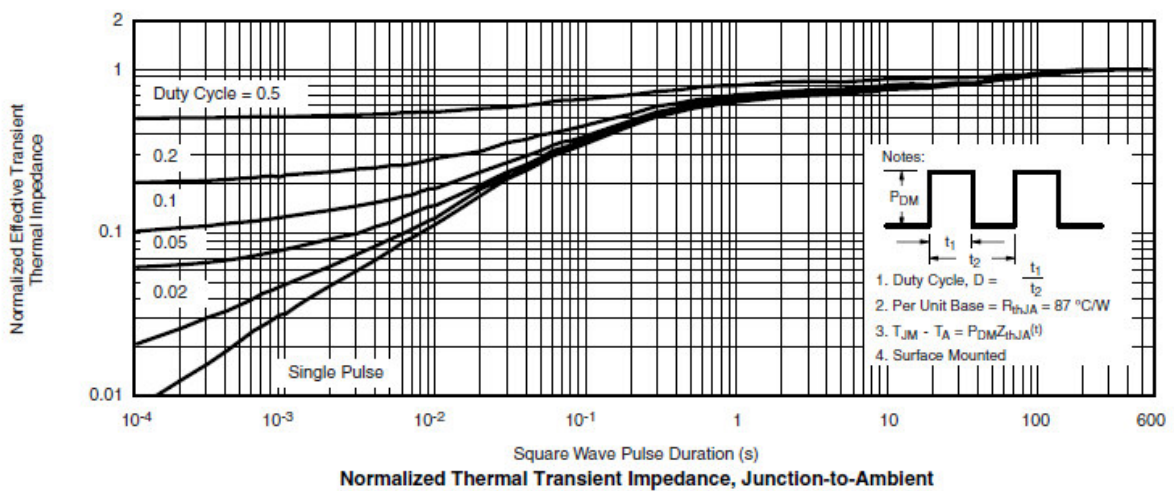
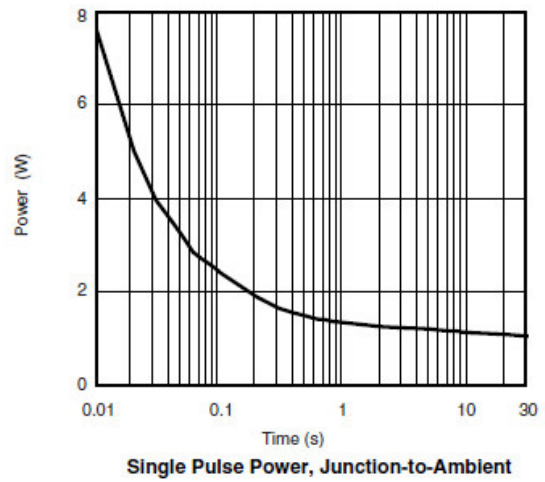
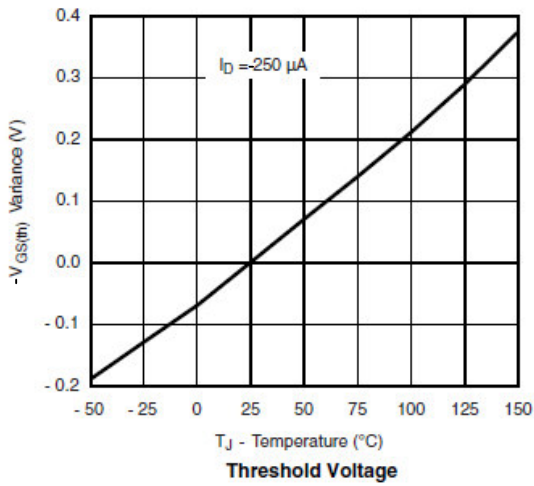
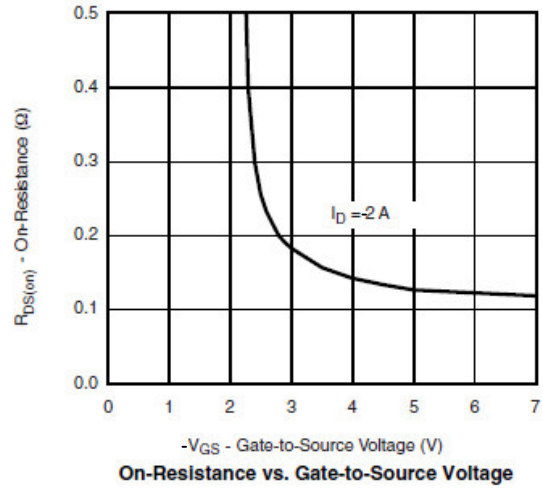
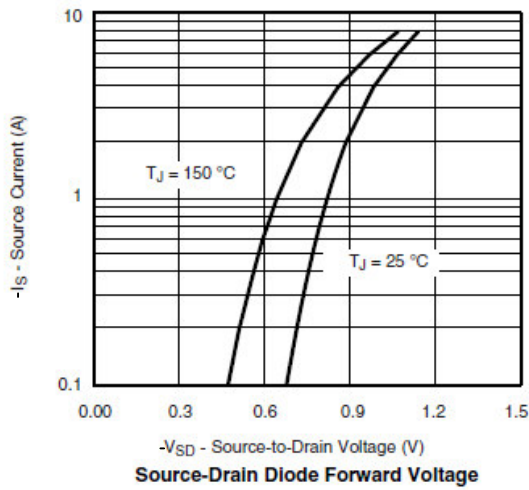
Unclamped Inductive Switching Test Circuit & Waveforms



Typical Performance Characteristics (P-Channel)

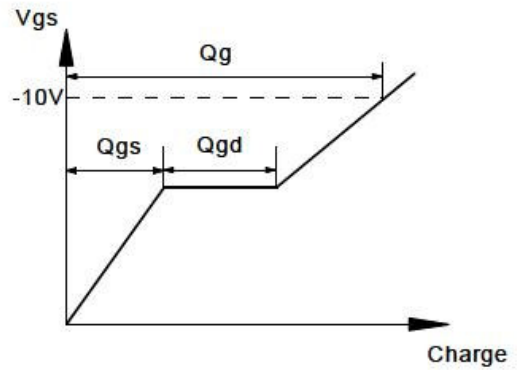
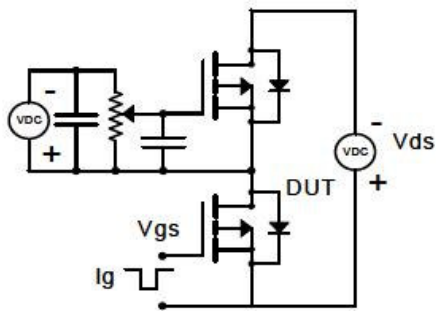


Typical Performance Characteristics (P-Channel Continue)

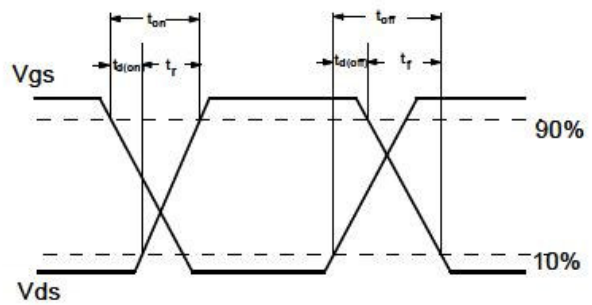
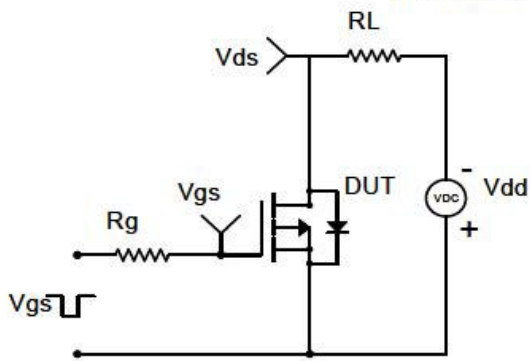


Typical Performance Characteristics (P-Channel Continue)

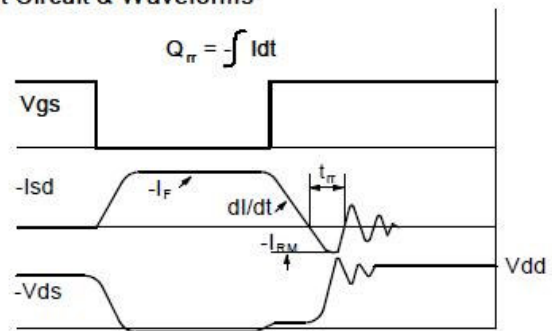
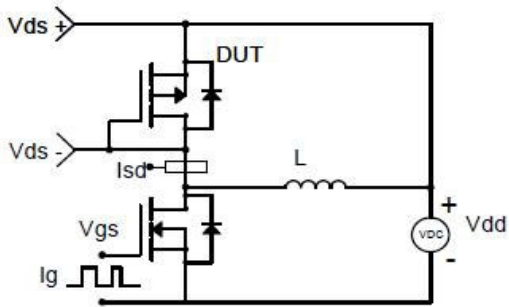
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

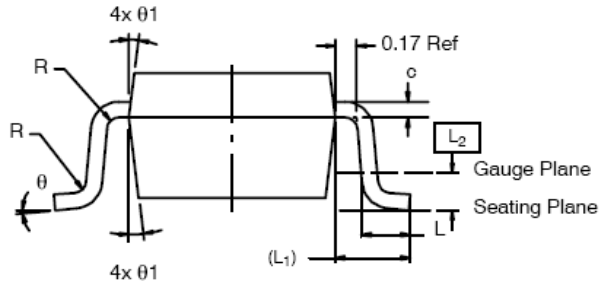
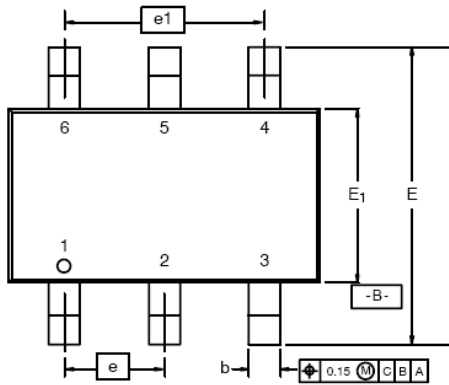


Diode Recovery Test Circuit & Waveforms



Package Dimension

TSOP-6 PLASTIC PACKAGE







| Dimensions | | | | | | |
|----------------|-------------|------|------|------------|-------|-------|
| SYMBOL | Millimeters | | | Inches | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.91 | - | 1.10 | 0.036 | - | 0.043 |
| A ₁ | 0.01 | - | 0.10 | 0.0004 | - | 0.004 |
| A ₂ | 0.90 | - | 1.00 | 0.035 | 0.038 | 0.039 |
| b | 0.30 | 0.32 | 0.45 | 0.012 | 0.013 | 0.018 |
| c | 0.10 | 0.15 | 0.20 | 0.004 | 0.006 | 0.008 |
| D | 2.95 | 3.05 | 3.10 | 0.116 | 0.120 | 0.122 |
| E | 2.70 | 2.85 | 2.98 | 0.106 | 0.112 | 0.117 |
| E ₁ | 1.55 | 1.65 | 1.70 | 0.061 | 0.065 | 0.067 |
| e | 1.00 BSC | | | 0.0394 BSC | | |
| e ₁ | 1.90 | 2.00 | 2.10 | 0.075 | 0.080 | 0.085 |
| L | 0.35 | - | 0.50 | 0.014 | - | 0.020 |
| L ₁ | 0.60 Ref | | | 0.024 Ref | | |
| L ₂ | 0.25 BSC | | | 0.010 BSC | | |
| R | 0.10 | - | - | 0.004 | - | - |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |
| θ ₁ | 7° Nom | | | 7° Nom | | |



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