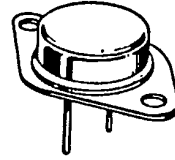


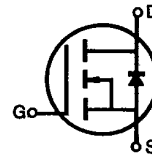
**IRF340/341/342/343****N-CHANNEL  
POWER MOSFETS****FEATURES**

- Low  $R_{DS(on)}$
- Improved inductive ruggedness
- Fast switching times
- Rugged polysilicon gate cell structure
- Low input capacitance
- Extended safe operating area
- Improved high temperature reliability
- TO-3 package (Standard)

TO-3

**PRODUCT SUMMARY**

| Part Number | $V_{DS}$ | $R_{DS(on)}$  | $I_D$ |
|-------------|----------|---------------|-------|
| IRF340      | 400V     | 0.55 $\Omega$ | 10A   |
| IRF341      | 350V     | 0.55 $\Omega$ | 10A   |
| IRF342      | 400V     | 0.80 $\Omega$ | 8.0A  |
| IRF343      | 350V     | 0.80 $\Omega$ | 8.0A  |

**MAXIMUM RATINGS**

| Characteristic                                                             | Symbol         | IRF340     | IRF341 | IRF342 | IRF343 | Unit          |
|----------------------------------------------------------------------------|----------------|------------|--------|--------|--------|---------------|
| Drain-Source Voltage (1)                                                   | $V_{DS}$       | 400        | 350    | 400    | 350    | Vdc           |
| Drain-Gate Voltage ( $R_{GS}=1.0M\Omega$ ) (1)                             | $V_{DGR}$      | 400        | 350    | 400    | 350    | Vdc           |
| Gate-Source Voltage                                                        | $V_{GS}$       | $\pm 20$   |        |        |        | Vdc           |
| Continuous Drain Current $T_C=25^\circ C$                                  | $I_D$          | 10         | 10     | 8.0    | 8.0    | Adc           |
| Continuous Drain Current $T_C=100^\circ C$                                 | $I_D$          | 6.0        | 6.0    | 5.0    | 5.0    | Adc           |
| Drain Current—Pulsed (3)                                                   | $I_{DM}$       | 40         | 40     | 32     | 32     | Adc           |
| Gate Current—Pulsed                                                        | $I_{GM}$       | $\pm 1.5$  |        |        |        | Adc           |
| Total Power Dissipation @ $T_C=25^\circ C$                                 | $P_D$          | 125        |        |        |        | Watts         |
| Derate above $25^\circ C$                                                  |                | 1.0        |        |        |        | W/ $^\circ C$ |
| Operating and Storage<br>Junction Temperature Range                        | $T_J, T_{stg}$ | -55 to 150 |        |        |        | $^\circ C$    |
| Maximum Lead Temp. for Soldering<br>Purposes, 1/8" from case for 5 seconds | $T_L$          | 300        |        |        |        | $^\circ C$    |

Notes: (1)  $T_J=25^\circ C$  to  $150^\circ C$ (2) Pulse test: Pulse width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ 

(3) Repetitive rating: Pulse width limited by max. junction temperature



## IRF340/341/342/343

N-CHANNEL  
POWER MOSFETSELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C unless otherwise specified)

| Characteristic                                  | Symbol              | Type             | Min | Typ  | Max  | Units | Test Conditions                                                                                                                                                      |
|-------------------------------------------------|---------------------|------------------|-----|------|------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Drain-Source Breakdown Voltage                  | BV <sub>DSS</sub>   | IRF340           | 400 | —    | —    | V     | V <sub>GS</sub> =0V                                                                                                                                                  |
|                                                 |                     | IRF342           | —   | —    | —    | —     | —                                                                                                                                                                    |
|                                                 |                     | IRF341<br>IRF343 | 350 | —    | —    | V     | I <sub>D</sub> =250μA                                                                                                                                                |
| Gate Threshold Voltage                          | V <sub>GS(th)</sub> | ALL              | 2.0 | —    | 4.0  | V     | V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA                                                                                                             |
| Gate-Source Leakage Forward                     | I <sub>GSS</sub>    | ALL              | —   | —    | 100  | nA    | V <sub>GS</sub> =20V                                                                                                                                                 |
| Gate-Source Leakage Reverse                     | I <sub>GSS</sub>    | ALL              | —   | —    | -100 | nA    | V <sub>GS</sub> =-20V                                                                                                                                                |
| Zero Gate Voltage Drain Current                 | I <sub>DSS</sub>    | ALL              | —   | —    | 250  | μA    | V <sub>DS</sub> =Max. Rating, V <sub>GS</sub> =0V                                                                                                                    |
|                                                 |                     |                  | —   | —    | 1000 | μA    | V <sub>DS</sub> =Max. Rating×0.8, V <sub>GS</sub> =0V, T <sub>C</sub> =125°C                                                                                         |
| On-State Drain-Source Current (2)               | I <sub>D(on)</sub>  | IRF340           | 10  | —    | —    | A     | V <sub>DS</sub> >I <sub>D(on)</sub> ×R <sub>DS(on)</sub> max., V <sub>GS</sub> =10V                                                                                  |
|                                                 |                     | IRF341           | —   | —    | —    | —     |                                                                                                                                                                      |
|                                                 |                     | IRF342<br>IRF343 | 8.0 | —    | —    | A     |                                                                                                                                                                      |
| Static Drain-Source On-State Resistance (2)     | R <sub>DS(on)</sub> | IRF340           | —   | 0.30 | 0.55 | Ω     | V <sub>GS</sub> =10V, I <sub>D</sub> =5.0A                                                                                                                           |
|                                                 |                     | IRF341           | —   | —    | —    | —     |                                                                                                                                                                      |
|                                                 |                     | IRF342<br>IRF343 | —   | 0.60 | 0.80 | Ω     |                                                                                                                                                                      |
| Forward Transconductance (2)                    | g <sub>fs</sub>     | ALL              | 4.0 | 7.0  | —    | U     | V <sub>DS</sub> >I <sub>D(on)</sub> ×R <sub>DS(on)</sub> max., I <sub>D</sub> =5.0A                                                                                  |
| Input Capacitance                               | C <sub>iss</sub>    | ALL              | —   | 1300 | 1600 | pF    | V <sub>GS</sub> =0V, V <sub>DS</sub> =25V, f=1.0MHz                                                                                                                  |
| Output Capacitance                              | C <sub>oss</sub>    | ALL              | —   | 250  | 450  | pF    |                                                                                                                                                                      |
| Reverse Transfer Capacitance                    | C <sub>rss</sub>    | ALL              | —   | 50   | 150  | pF    |                                                                                                                                                                      |
| Turn-On Delay Time                              | t <sub>d(on)</sub>  | ALL              | —   | —    | 35   | ns    | V <sub>DD</sub> =0.5BV <sub>DSS</sub> , I <sub>D</sub> =5.0A, Z <sub>O</sub> =4.7Ω<br>(MOSFET switching times are essentially independent of operating temperature.) |
| Rise Time                                       | t <sub>r</sub>      | ALL              | —   | —    | 15   | ns    |                                                                                                                                                                      |
| Turn-Off Delay Time                             | t <sub>d(off)</sub> | ALL              | —   | —    | 90   | ns    |                                                                                                                                                                      |
| Fall Time                                       | t <sub>f</sub>      | ALL              | —   | —    | 35   | ns    |                                                                                                                                                                      |
| Total Gate Charge (Gate-Source Plus Gate-Drain) | Q <sub>g</sub>      | ALL              | —   | 41   | 60   | nC    | V <sub>GS</sub> =10V, I <sub>D</sub> =12A, V <sub>DS</sub> =0.8 Max. Rating<br>(Gate charge is essentially independent of operating temperature.)                    |
| Gate-Source Charge                              | Q <sub>gs</sub>     | ALL              | —   | 6.0  | —    | nC    |                                                                                                                                                                      |
| Gate-Drain ("Miller") Charge                    | Q <sub>gd</sub>     | ALL              | —   | 35   | —    | nC    |                                                                                                                                                                      |

## THERMAL RESISTANCE

|                     |                   |     |   |     |     |     |                                            |
|---------------------|-------------------|-----|---|-----|-----|-----|--------------------------------------------|
| Junction-to-Case    | R <sub>thJC</sub> | ALL | — | —   | 1.0 | K/W |                                            |
| Case-to-Sink        | R <sub>thCS</sub> | ALL | — | 0.1 | —   | K/W | Mounting surface flat, smooth, and greased |
| Junction-to-Ambient | R <sub>thJA</sub> | ALL | — | —   | 30  | K/W | Free Air Operation                         |

Notes: (1) T<sub>J</sub>=25°C to 150°C

(2) Pulse test: Pulse width≤300μs, Duty Cycle≤2%

(3) Repetitive rating: Pulse width limited by max. junction temperature

## IRF340/341/342/343

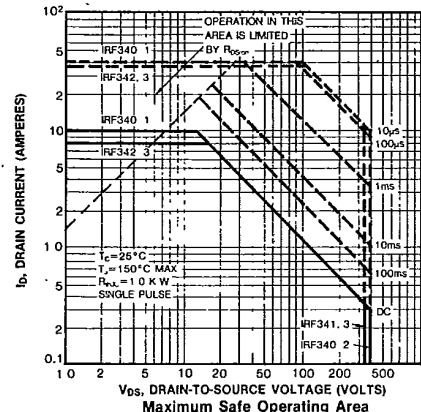
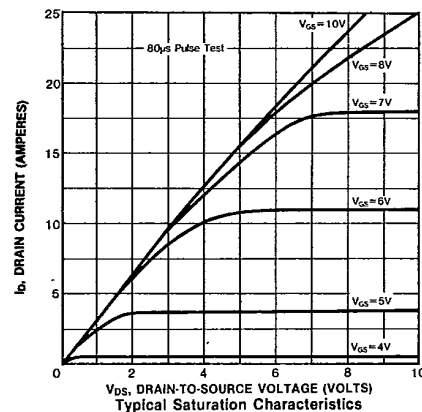
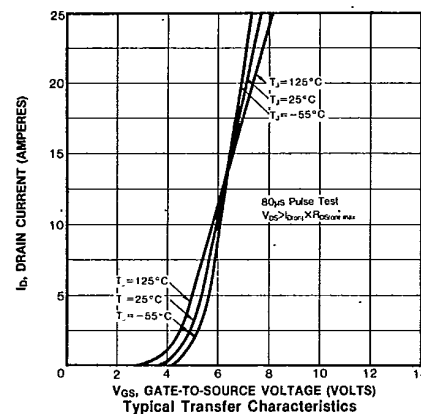
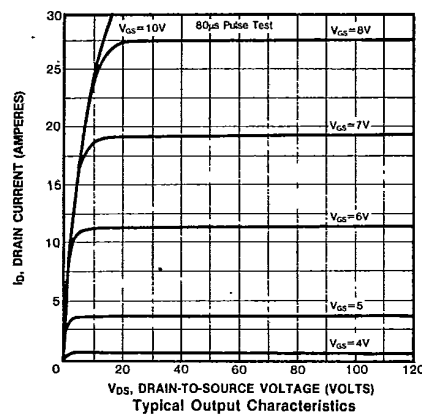
N-CHANNEL  
POWER MOSFETS

## SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

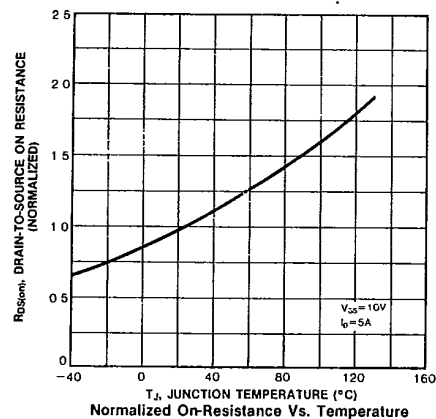
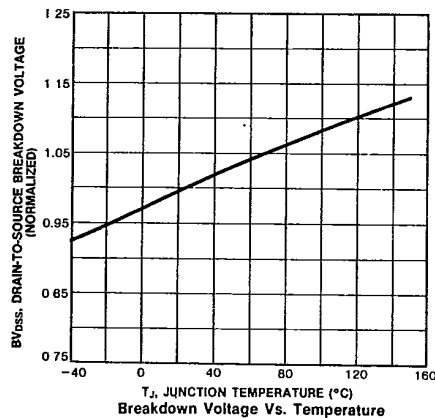
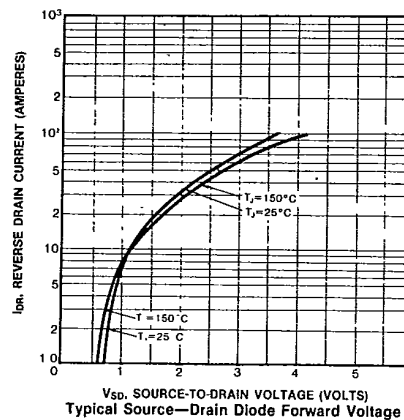
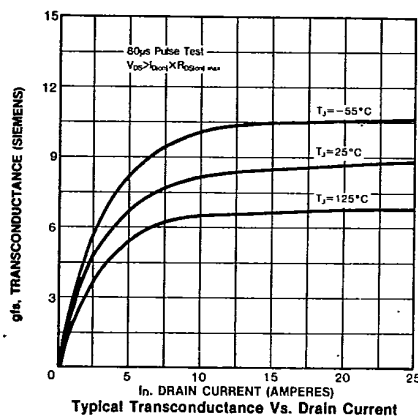
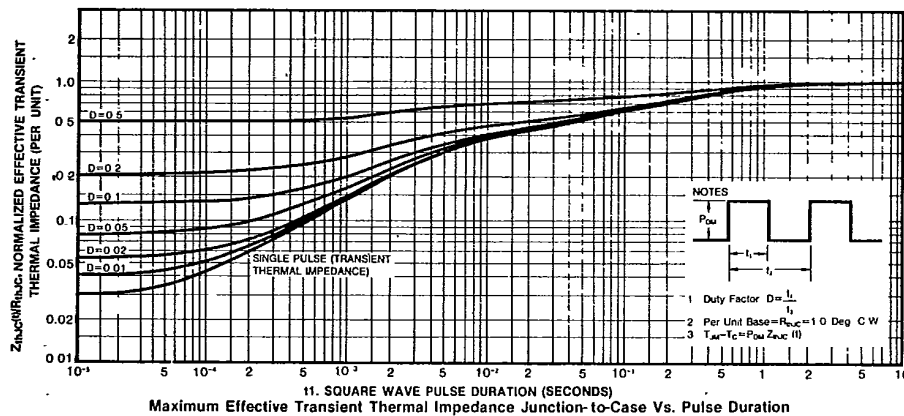
| Characteristic                            | Symbol   | Type             | Min | Typ | Max | Units | Test Conditions                                                                  |
|-------------------------------------------|----------|------------------|-----|-----|-----|-------|----------------------------------------------------------------------------------|
| Continuous Source Current<br>(Body Diode) | $I_S$    | IRF340<br>IRF341 | —   | —   | 10  | A     | Modified MOSFET symbol<br>showing the integral<br>reverse P-N junction rectifier |
|                                           |          | IRF342<br>IRF343 | —   | —   | 8.0 | A     |                                                                                  |
| Pulse Source Current<br>(Body Diode) (3)  | $I_{SM}$ | IRF340<br>IRF341 | —   | —   | 40  | A     |                                                                                  |
|                                           |          | IRF342<br>IRF343 | —   | —   | 32  | A     |                                                                                  |
| Diode Forward Voltage (2)                 | $V_{SD}$ | IRF340<br>IRF341 | —   | —   | 2.0 | V     | $T_C=25^\circ\text{C}$ , $I_S=10\text{A}$ , $V_{GS}=0\text{V}$                   |
|                                           |          | IRF342<br>IRF343 | —   | —   | 1.9 | V     | $T_C=25^\circ\text{C}$ , $I_S=8.0\text{A}$ , $V_{GS}=0\text{V}$                  |
| Reverse Recovery Time                     | $t_{rr}$ | ALL              | —   | 800 | —   | ns    | $T_J=150^\circ\text{C}$ , $I_F=10\text{A}$ , $dI_F/dt=100\text{A}/\mu\text{s}$   |

Notes: (1)  $T_J=25^\circ\text{C}$  to  $150^\circ\text{C}$  (2) Pulse test: Pulse width  $\leq 300\mu\text{s}$ , Duty Cycle  $\leq 2\%$ 

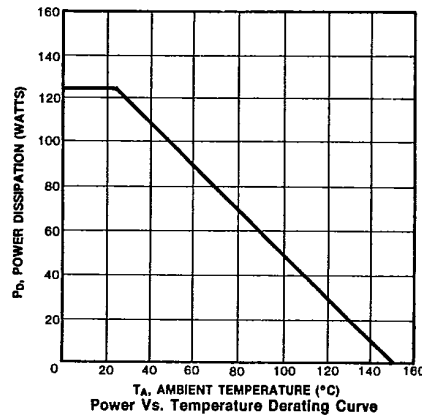
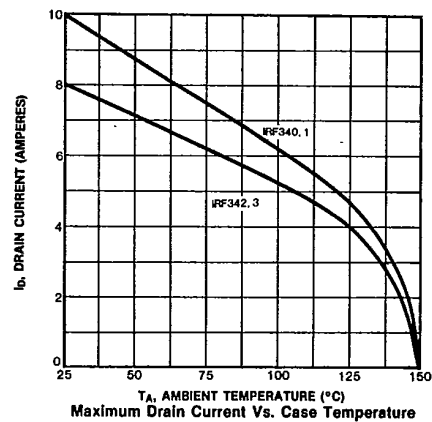
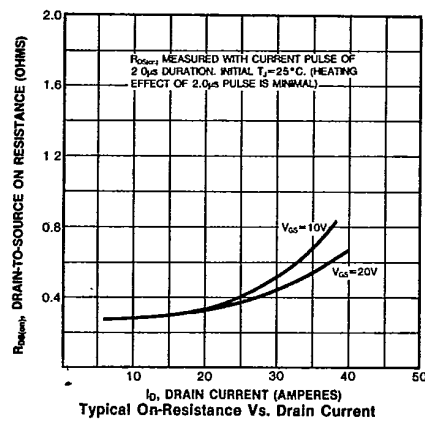
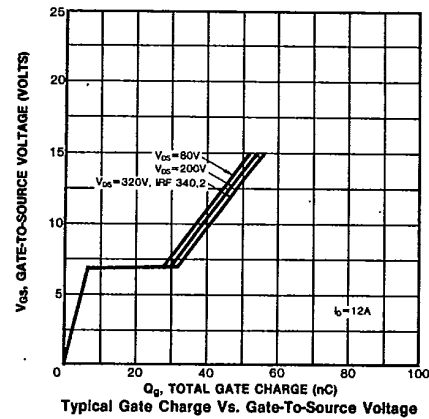
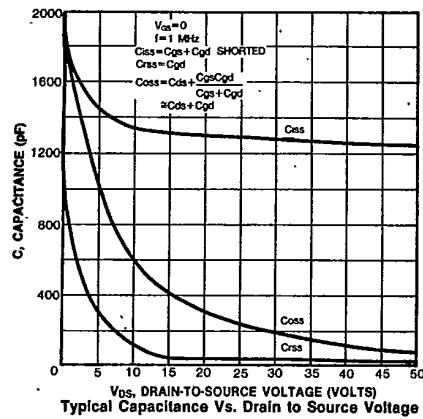
(3) Repetitive rating: Pulse width limited by max. junction temperature



## IRF340/341/342/343

N-CHANNEL  
POWER MOSFETS

## IRF340/341/342/343

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POWER MOSFETS

SAMSUNG SEMICONDUCTOR