

| V_{DSS} | R_{DS(on)} max | I_D |
|------------------------|-------------------------------|----------------------|
| -30V | 0.098@V _{GS} = -10V | -3.8A |
| | 0.165@V _{GS} = -4.5V | -3.0A |

Description

Absolute Maximum Ratings

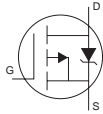
| | Parameter | Max. | Units |
|--|--|--------------|--------------|
| V _{DS} | Drain-Source Voltage | -30 | V |
| I _D @ T _A = 25°C | Continuous Drain Current, V _{GS} @ -10V | -3.8 | A |
| I _D @ T _A = 70°C | Continuous Drain Current, V _{GS} @ -10V | -3.0 | |
| I _{DM} | Pulsed Drain Current ^① | -15 | |
| P _D @ T _A = 25°C | Maximum Power Dissipation ^③ | 2 | W |
| P _D @ T _A = 70°C | Maximum Power Dissipation ^③ | 1.28 | W |
| | Linear Derating Factor | 0.02 | W/°C |
| V _{GS} | Gate-to-Source Voltage | ± 20 | V |
| T _J , T _{STG} | Junction and Storage Temperature Range | -55 to + 150 | °C |

Thermal Resistance

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|---------------------------------|--------------------------------------|------|------|-------|----------|--|
| $V_{(BR)DSS}$ | Drain-to-Source Breakdown Voltage | -30 | — | — | V | $V_{GS} = 0V, I_D = -250\mu A$ |
| $\Delta V_{(BR)DSS}/\Delta T_J$ | Breakdown Voltage Temp. Coefficient | — | 0.02 | — | V/°C | Reference to $25^\circ\text{C}, I_D = -1\text{mA}$ |
| $R_{DS(on)}$ | Static Drain-to-Source On-Resistance | — | — | 0.098 | Ω | $V_{GS} = -10V, I_D = -3.8A$ ② |
| | | — | — | 0.165 | | $V_{GS} = -4.5V, I_D = -3.0A$ ② |
| $V_{GS(th)}$ | Gate Threshold Voltage | -1.0 | — | -2.5 | V | $V_{DS} = V_{GS}, I_D = -250\mu A$ |
| g_{fs} | Forward Transconductance | 3.5 | — | — | S | $V_{DS} = -10V, I_D = -3.8A$ |
| I_{DSS} | Drain-to-Source Leakage Current | — | — | -15 | μA | $V_{DS} = -24V, V_{GS} = 0V$ |
| | | — | — | -25 | | $V_{DS} = -24V, V_{GS} = 0V, T_J = 70^\circ\text{C}$ |
| I_{GSS} | Gate-to-Source Forward Leakage | — | — | -100 | nA | $V_{GS} = -20V$ |
| | Gate-to-Source Reverse Leakage | — | — | 100 | | $V_{GS} = 20V$ |
| Q_g | Total Gate Charge | — | 11 | 17 | nC | $I_D = -3.8A$ |
| Q_{gs} | Gate-to-Source Charge | — | 2.3 | — | | $V_{DS} = -15V$ |
| Q_{gd} | Gate-to-Drain ("Miller") Charge | — | 1.5 | — | | $V_{GS} = -10V$ |
| $t_{d(on)}$ | Turn-On Delay Time | — | 11 | 17 | ns | $V_{DD} = -15V, V_{GS} = -10V$ |
| t_r | Rise Time | — | 14 | 21 | | $I_D = -1.0A$ |
| $t_{d(off)}$ | Turn-Off Delay Time | — | 90 | 135 | | $R_G = 6.0\Omega$ |
| t_f | Fall Time | — | 49 | 74 | | $R_D = 15\Omega$ ② |
| C_{iss} | Input Capacitance | — | 511 | — | pF | $V_{GS} = 0V$ |
| C_{oss} | Output Capacitance | — | 79 | — | | $V_{DS} = -25V$ |
| C_{rss} | Reverse Transfer Capacitance | — | 50 | — | | $f = 1.0\text{MHz}$ |

Source-Drain Ratings and Characteristics

| | Parameter | Min. | Typ. | Max. | Units | Conditions |
|----------|---|------|------|------|-------|--|
| I_S | Continuous Source Current (Body Diode) | — | — | -2.0 | A | MOSFET symbol showing the integral reverse p-n junction diode.  |
| I_{SM} | Pulsed Source Current (Body Diode) ① | — | — | -15 | | |
| V_{SD} | Diode Forward Voltage | — | — | -1.2 | V | $T_J = 25^\circ\text{C}, I_S = -2.0A, V_{GS} = 0V$ ② |
| t_{rr} | Reverse Recovery Time | — | 19 | 29 | ns | $T_J = 25^\circ\text{C}, I_F = -2.0A$ |
| Q_{rr} | Reverse Recovery Charge | — | 16 | 24 | nC | $di/dt = -100A/\mu s$ ② |

Notes:

① Repetitive rating; pulse width limited by max. junction temperature.

② Pulse width $\leq 400\mu s$; duty cycle $\leq 2\%$.

③ Surface mounted on 1 in square Cu board, $t \leq 10\text{sec}$.

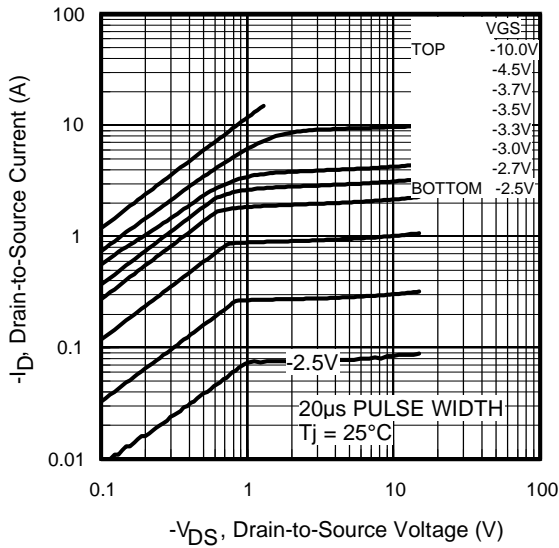


Fig 1. Typical Output Characteristics

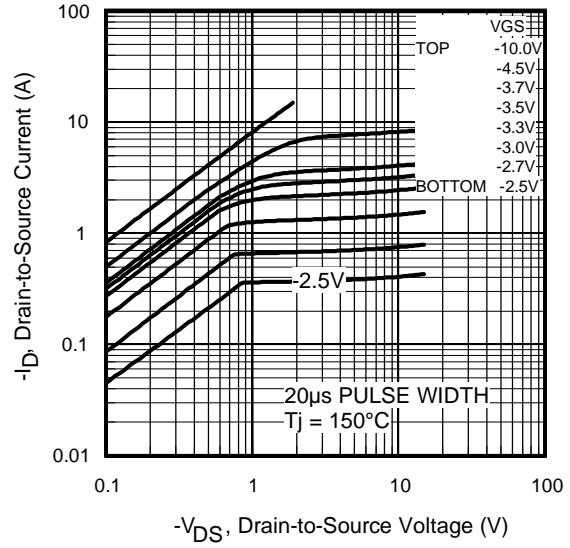


Fig 2. Typical Output Characteristics

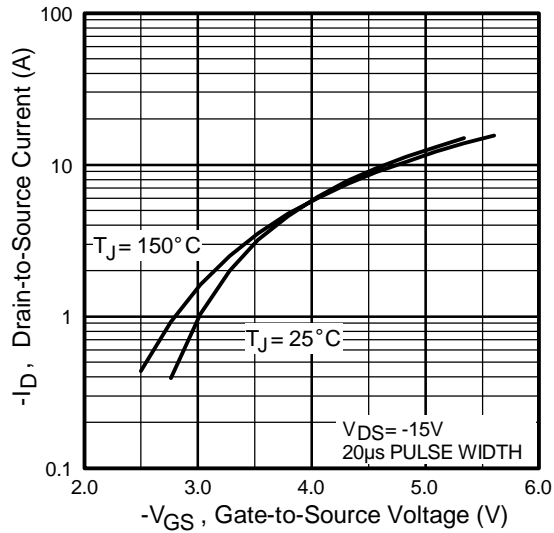


Fig 3. Typical Transfer Characteristics

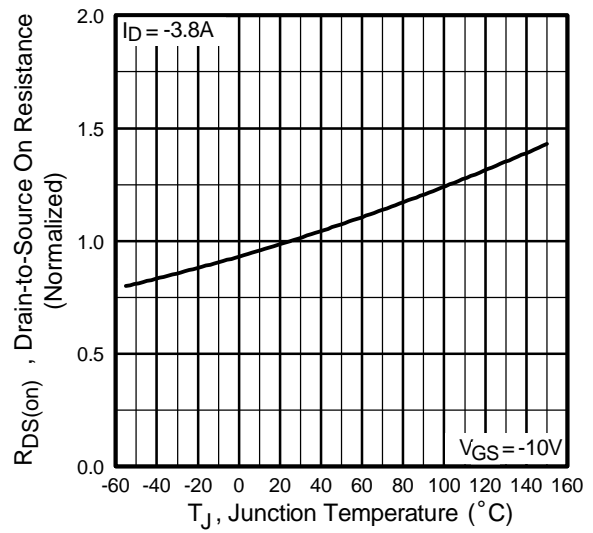


Fig 4. Normalized On-Resistance Vs. Temperature

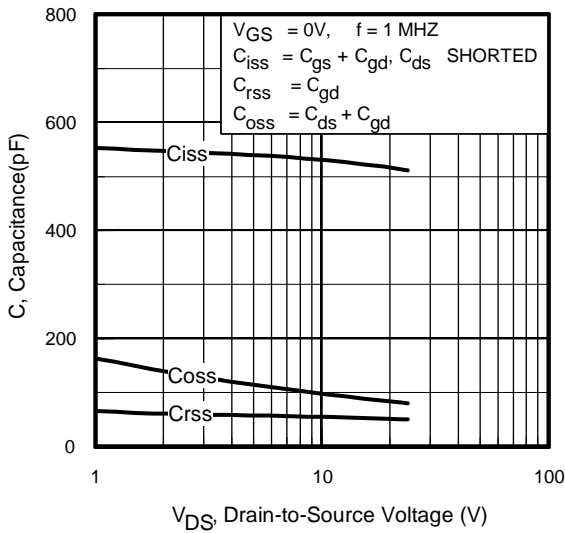


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

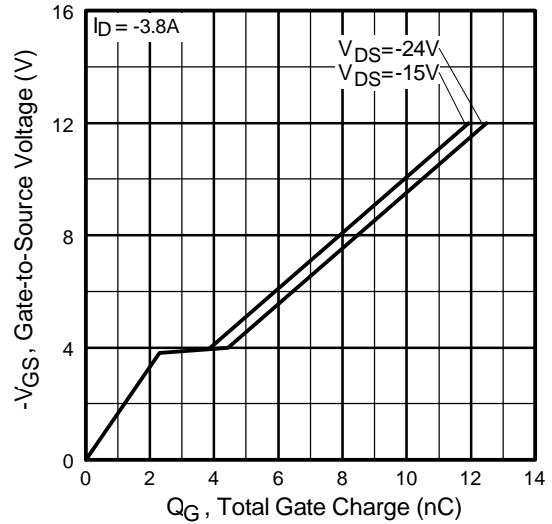


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

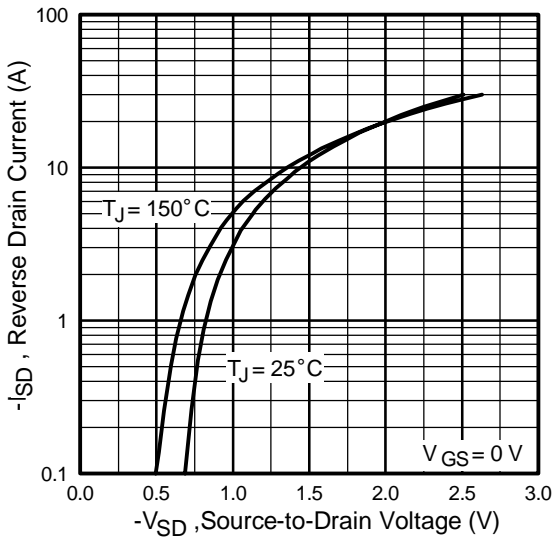


Fig 7. Typical Source-Drain Diode Forward Voltage

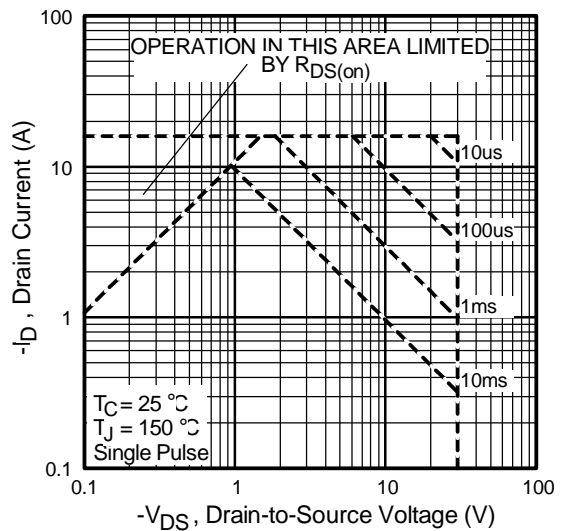


Fig 8. Maximum Safe Operating Area

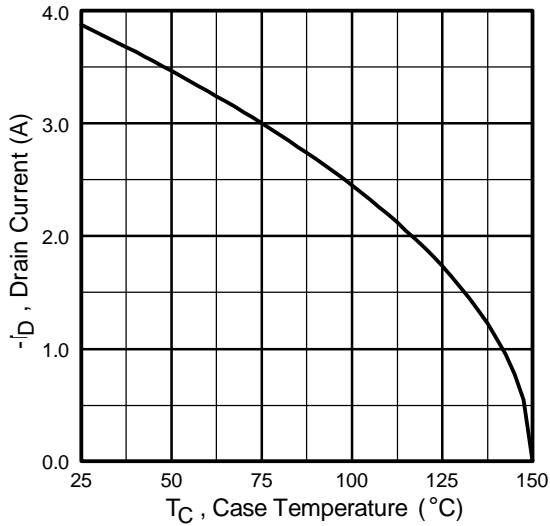


Fig 9. Maximum Drain Current Vs. Case Temperature

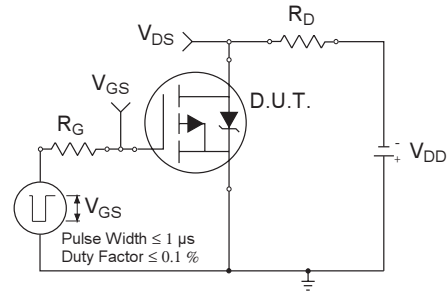


Fig 10a. Switching Time Test Circuit

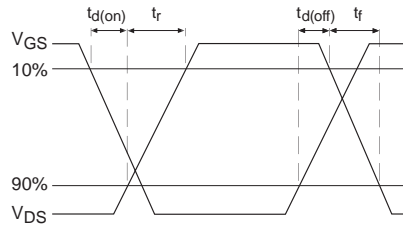


Fig 10b. Switching Time Waveforms

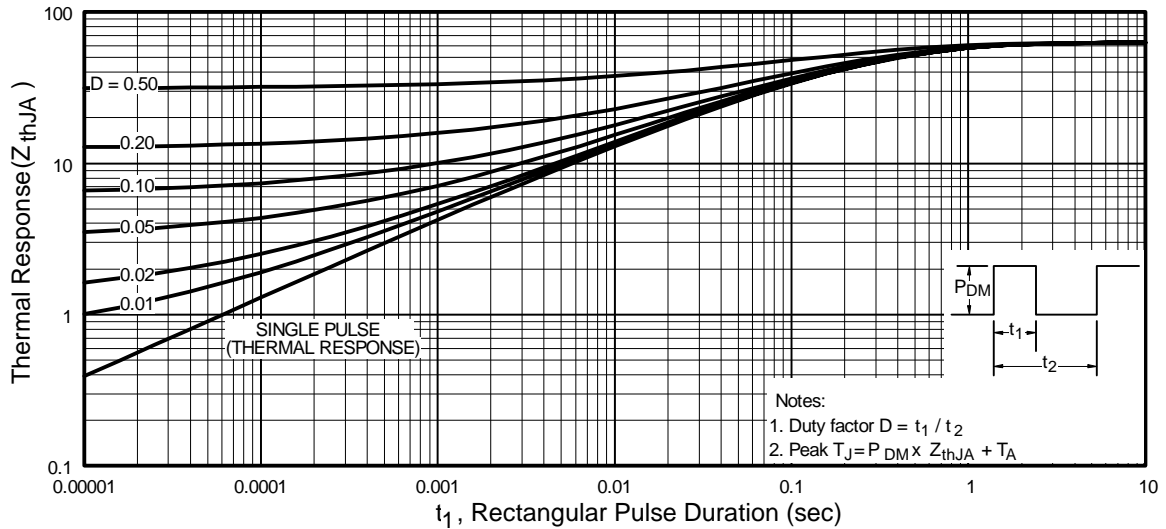


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

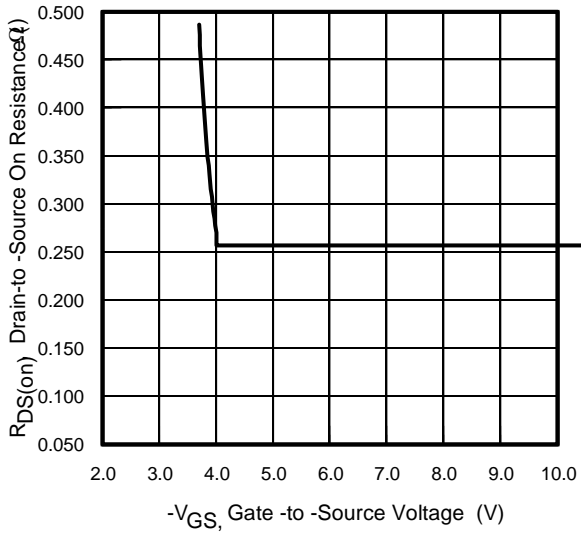


Fig 12. Typical On-Resistance Vs. Gate Voltage

Fig 13. Typical On-Resistance Vs. Drain Current

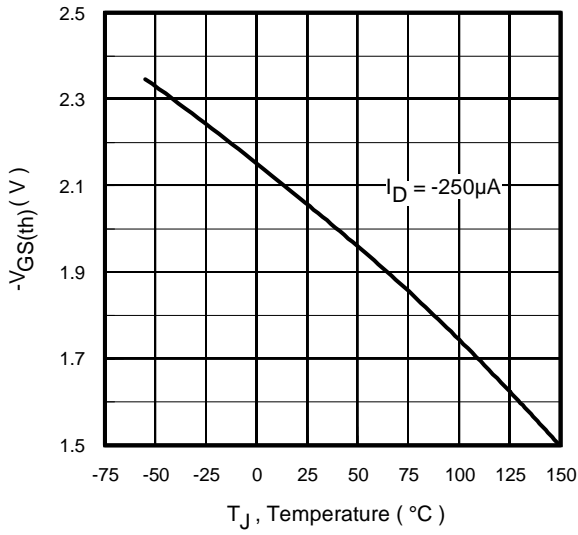


Fig 15. Typical $V_{GS(th)}$ Vs. Junction Temperature

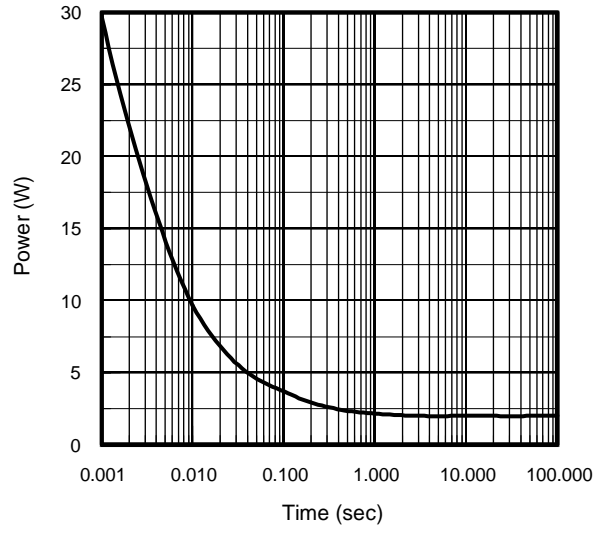
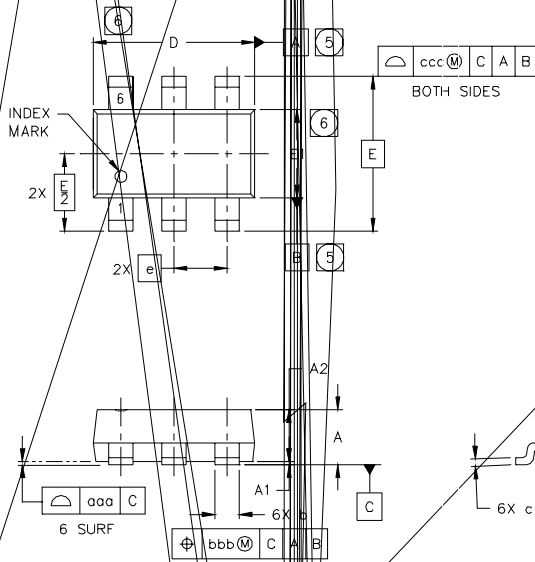


Fig 16. Typical Power Vs. Time

IRF5805

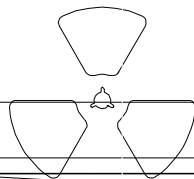
TSOP-6 Package Outline

International
IR Rectifier



| SYMBOL | MO-193AA DIMENSIONS | | | | | |
|----------|---------------------|------|------|-----------|-------|-------|
| | MILLIMETERS | | | INCHES | | |
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | --- | --- | 1.10 | --- | --- | .0433 |
| A1 | 0.01 | --- | 0.10 | .0004 | --- | .0039 |
| A2 | 0.80 | 0.90 | 1.00 | .0315 | .0354 | .0393 |
| b | 0.25 | --- | 0.50 | .0099 | --- | .0196 |
| c | 0.10 | --- | 0.26 | .004 | --- | .010 |
| D | 2.90 | 3.00 | 3.10 | .115 | .118 | .122 |
| E | 2.75 BSC | | | .108 BSC | | |
| E1 | 1.30 | 1.50 | 1.70 | .052 | .059 | .066 |
| e | 1.00 BSC | | | .039 BSC | | |
| L | 0.20 | 0.40 | 0.60 | .0079 | .0157 | .0236 |
| L1 | 0.30 BSC | | | .0118 BSC | | |
| θ | 0° | --- | 8° | 0° | --- | 8° |
| aaa | 0.10 | | | .004 | | |
| bbb | 0.15 | | | .006 | | |
| ccc | 0.25 | | | .010 | | |

TSOP-6 Tape & Reel Information



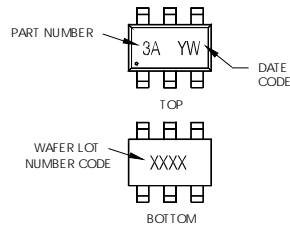
NOTES
1. OUTLINE

TSOP-6 Part Marking Information

Notes: This part marking information applies to devices produced before 02/26/2001

EXAMPLE: THIS IS AN S13443DV

WW = (1-26) IF PRECEDED BY LAST DIGIT OF CALENDAR YEAR



PART NUMBER CODE REFERENCE:

3A = S13443DV
 3B = IRF5800
 3C = IRF5850
 3D = IRF5851
 3E = IRF5852
 3I = IRF5805
 3J = IRF5806

DATE CODE EXAMPLES:

YWW = 9603 = 6C
 YWW = 9632 = FF

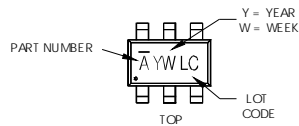
| YEAR | Y | WORK WEEK | W |
|------|---|-----------|---|
| 2001 | 1 | 01 | A |
| 2002 | 2 | 02 | B |
| 2003 | 3 | 03 | C |
| 2004 | 4 | 04 | D |
| 2005 | 5 | | |
| 1996 | 6 | | |
| 1997 | 7 | | |
| 1998 | 8 | | |
| 1999 | 9 | | |
| 2000 | 0 | 24 | X |
| | | 25 | Y |
| | | 26 | Z |

WW = (27-52) IF PRECEDED BY A LETTER

| YEAR | Y | WORK WEEK | W |
|------|---|-----------|---|
| 2001 | A | 27 | A |
| 2002 | B | 28 | B |
| 2003 | C | 29 | C |
| 2004 | D | 30 | D |
| 2005 | E | | |
| 1996 | F | | |
| 1997 | G | | |
| 1998 | H | | |
| 1999 | J | | |
| 2000 | K | 50 | X |
| | | 51 | Y |
| | | 52 | Z |

Notes: This part marking information applies to devices produced after 02/26/2001

W = (1-26) IF PRECEDED BY LAST DIGIT OF CALENDAR YEAR



PART NUMBER CODE REFERENCE:

A = S13443DV
 B = IRF5800
 C = IRF5850
 D = IRF5851
 E = IRF5852
 I = IRF5805
 J = IRF5806
 K = IRF5810
 L = IRF5804
 M = IRF5803
 N = IRF5820

| YEAR | Y | WORK WEEK | W |
|------|---|-----------|---|
| 2001 | 1 | 01 | A |
| 2002 | 2 | 02 | B |
| 2003 | 3 | 03 | C |
| 2004 | 4 | 04 | D |
| 2005 | 5 | | |
| 1996 | 6 | | |
| 1997 | 7 | | |
| 1998 | 8 | | |
| 1999 | 9 | | |
| 2000 | 0 | 24 | X |
| | | 25 | Y |
| | | 26 | Z |

W = (27-52) IF PRECEDED BY A LETTER

| YEAR | Y | WORK WEEK | W |
|------|---|-----------|---|
| 2001 | A | 27 | A |
| 2002 | B | 28 | B |
| 2003 | C | 29 | C |
| 2004 | D | 30 | D |
| 2005 | E | | |
| 1996 | F | | |
| 1997 | G | | |
| 1998 | H | | |
| 1999 | J | | |
| 2000 | K | 50 | X |
| | | 51 | Y |
| | | 52 | Z |