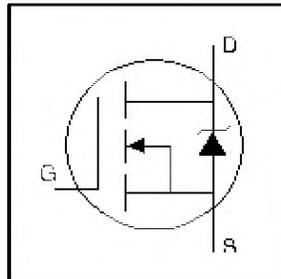


IRFDC20PbF

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- For Automatic Insertion
- End Stackable
- Fast Switching
- Ease of paralleling
- Simple Drive Requirements
- Lead-Free

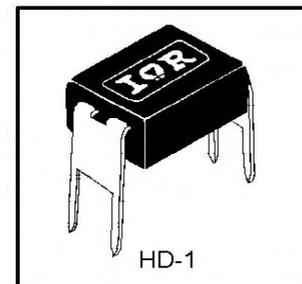


$V_{DSS} = 600V$
$R_{DS(on)} = 4.4\Omega$
$I_D = 0.32A$

Description

Third Generation HEXFETs from International Rectifier provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The 4-pin DIP package is a low-cost machine-insertable case style which can be stacked in multiple combinations on standard 0.1 inch pin centers. The dual drain serves as a thermal link to the mounting surface for power dissipation levels up to 1 watt.



Absolute Maximum Ratings

	Parameter	Max.	Units
$I_D @ T_C = 25^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	0.32	A
$I_D @ T_C = 100^\circ C$	Continuous Drain Current, $V_{GS} @ 10 V$	0.20	
I_{DM}	Pulsed Drain Current $\text{\textcircled{D}}$	2.6	
$P_D @ T_C = 25^\circ C$	Power Dissipation	1.0	W
	Linear Derating Factor	0.0083	W/°C
V_{GS}	Gate-to-Source Voltage	± 20	V
E_{AS}	Single Pulse Avalanche Energy $\text{\textcircled{E}}$	50	mJ
I_{AR}	Avalanche Current $\text{\textcircled{I}}$	0.32	A
E_{AR}	Repetitive Avalanche Energy $\text{\textcircled{E}}$	0.10	mJ
dv/dt	Peak Diode Recovery dv/dt $\text{\textcircled{D}}$	3.0	V/ns
T_J	Operating Junction and	-55 to + 150	°C
T_{STG}	Storage Temperature Range		
	Soldering Temperature, for 10 seconds	300 (1.6mm from case)	

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JA}$	Junction-to-Ambient	—	—	120	°C/W

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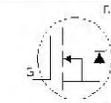
Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)DSS}$	Drain-to-Source Breakdown Voltage	600	—	—	V	$V_{GS} = 0V, I_D = 250\mu A$
$\Delta V_{(BR)DSS}/\Delta T_J$	Breakdown Voltage Temp. Coefficient	—	0.88	—	$V/^\circ\text{C}$	Reference to 25°C , $I_D = 1mA$
$R_{DS(on)}$	Static Drain-to-Source On-Resistance	—	—	4.4	Ω	$V_{GS} = 10.0V, I_D = 0.19A$ ②
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
g_{fs}	Forward Transconductance	1.4	—	—	S	$V_{DS} = 50V, I_D = 1.3A$
I_{DSS}	Drain-to-Source Leakage Current	—	—	25	μA	$V_{DS} = 600V, V_{GS} = 0V$
		—	—	250		$V_{DS} = 480V, V_{GS} = 0V, T_J = 125^\circ\text{C}$
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	—	—	18	nC	$I_D = 2.0A$
Q_{gs}	Gate-to-Source Charge	—	—	3.0		$V_{DS} = 360V$
Q_{gd}	Gate-to-Drain ("Miller") Charge	—	—	8.9		$V_{GS} = 10V$ ④
$t_{d(on)}$	Turn-On Delay Time	—	10	—	ns	$V_{DD} = 300V$
t_r	Rise Time	—	23	—		$I_D = 2.0A$
$t_{d(off)}$	Turn-Off Delay Time	—	30	—		$R_G = 18\Omega$
t_f	Fall Time	—	25	—		$R_D = 150\Omega$ ④
L_D	Internal Drain Inductance	—	4.0	—	nH	Between lead, 6mm (0.25in.) from package and center of die contact
L_S	Internal Source Inductance	—	6.0	—		
C_{iss}	Input Capacitance	—	350	—	pF	$V_{GS} = 0V$
C_{oss}	Output Capacitance	—	48	—		$V_{DS} = 25V$
C_{rss}	Reverse Transfer Capacitance	—	8.6	—		$f = 1.0MHz$



Source-Drain Ratings and Characteristics

	Parameter	Min.	Typ.	Max.	Units	Conditions
I_S	Continuous Source Current (Body Diode)	—	—	0.32	A	MOSFET symbol showing the integral reverse p-n junction diode.
I_{SM}	Pulsed Source Current (Body Diode) ③	—	—	2.6		
V_{SD}	Diode Forward Voltage	—	—	1.6	V	$T_J = 25^\circ\text{C}, I_S = 0.32A, V_{GS} = 0V$ ④
t_{rr}	Reverse Recovery Time	—	290	580	ns	$T_J = 25^\circ\text{C}, I_F = 2.0A$
Q_{rr}	Reverse Recovery Charge	—	0.67	1.3	μC	$di/dt = 100A/\mu s$ ④
t_{on}	Forward Turn-On Time	Intrinsic turn-on time is negligible (turn-on is dominated by $L_S + L_D$)				



Notes:

- ① Repetitive rating; pulse width limited by max. junction temperature.
- ② $V_{DD} = 50V$, starting $T_J = 25^\circ\text{C}$, $L = 54mH$, $R_G = 25\Omega$, $I_{AS} = 1.3A$.
- ③ $I_{SD} \leq 4.4A$, $di/dt \leq 90A/\mu s$, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq 150^\circ\text{C}$.
- ④ Pulse width $\leq 300\mu s$; duty cycle $\leq 2\%$.

IRFDC20PbF



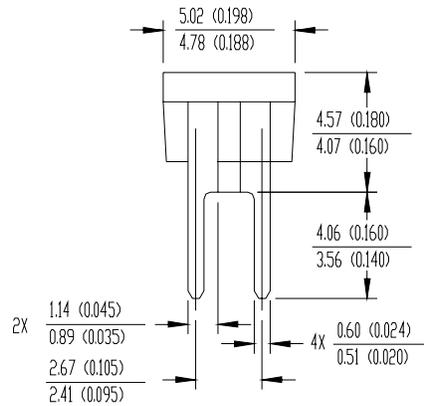
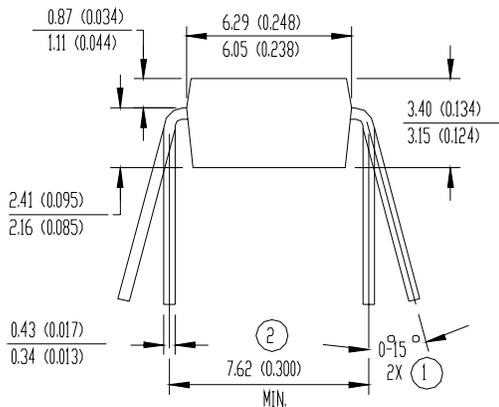
Hexdip Package Outline

Dimensions are shown in millimeters (inches)



NOTES:

- ① APPLIES TO SPREAD OF LEADS PRIOR TO INSTALLATION
- ② APPLIES TO INSTALLED LEAD CENTERS
- 3 CONTROLLING DIMENSION- INCH.
- 4 DIMENSIONS ARE SHOWN MILLIMETERS (INCHES).
- 5 CASE STYLE HD-1 (SIMILAR TO JEDEC OUTLINE MO-001AN)
- 6 DIMENSIONS SHOWN ARE BEFORE SOLDER DIP
SOLDER DIP MAX. + 0.16 (0.006)



Hexdip Part Marking Information

EXAMPLE: THIS IS AN IRFD120

