

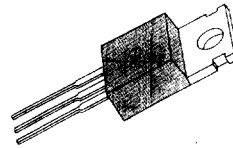
FEATURES

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

PRODUCT SUMMARY

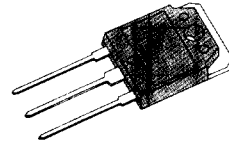
Part Number	V_{DS}	$R_{DS(on)}$	I_D
IRF740/IRFP340	400V	0.55Ω	10A
IRF741/IRFP341	350V	0.55Ω	10A
IRF742/IRFP342	400V	0.80Ω	8.3A
IRF743/IRFP343	350V	0.80Ω	8.3A

TO-220



IRF740/741/742/743

TO-3P



IRFP340/341/342/343

MAXIMUM RATINGS

Characteristics	Symbol	IRF740 IRFP340	IRF741 IRFP341	IRF742 IRFP342	IRF743 IRFP343	Unit
Drain-Source Voltage (1)	V_{DSS}	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}	± 20				Vdc
Continuous Drain Current $T_C=25^\circ C$	I_D	10	10	8.3	8.3	Adc
Continuous Drain Current $T_C=100^\circ C$	I_D	6.3	6.3	5.2	5.2	Adc
Drain Current—Pulsed (3)	I_{DM}	40	40	33	33	Adc
Gate Current—Pulsed	I_{GM}	± 1.5				Adc
Single Pulsed Avalanche Energy (4)	E_{AS}	520				mJ
Avalanche Current	I_{AS}	10				A
Total Power Dissipation @ $T_C=25^\circ C$ Derate above $25^\circ C$	P_D	125 1.0				Watts W/ $^\circ C$
Operating and Storage Junction to Case	T_J, T_{stg}	-55 to 150				$^\circ C$
Maximum Lead Temp. for Soldering 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 with limited by max. junction temperature
(4) $L=9.1 mH$, $V_{dd}=50V$, $R_G=25\Omega$, Starting $T_J=25^\circ C$

ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$ unless otherwise specified)

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
BV_{DSS}	Drain-Source Breakdown Voltage IRF740/IRFP340 IRF742/IRFP342	400	—	—	V	$V_{GS}=0V$ $I_D=250\mu A$
	IRF741/IRFP341 IRF743/IRFP343	350	—	—	V	
$V_{GS(th)}$	Gate Threshold Voltage	2.0	—	4.0	V	$V_{DS}=V_{GS}$, $I_D=250\mu A$
I_{GSS}	Gate-Source Leakage Forward	—	—	100	nA	$V_{GS}=20V$
I_{GSS}	Gate-Source Leakage Reverse	—	—	-100	nA	$V_{GS}=-20V$
I_{DSS}	Zero Gate Voltage Drain Current	—	—	250	μA	$V_{DS}=\text{Max. Rating}$, $V_{GS}=0V$
		—	—	1000	μA	$V_{DS}=\text{Max. Rating} \times 0.8$, $V_{GS}=0V$, $T_C=125^\circ\text{C}$
$I_{D(on)}$	On-State Drain-Source Current (2) IRF740/IRFP340 IRF741/IRFP341	10	—	—	A	$V_{DS} \geq 8V$, $V_{GS}=10V$
	IRF742/IRFP342 IRF743/IRFP343	8.3	—	—	A	
$R_{DS(on)}$	Static Drain-Source On-State Resistance (2) IRF740/IRFP340 IRF741/IRFP341	—	—	0.55	Ω	$V_{GS}=10V$, $I_D=5.2A$
	IRF742/IRFP342 IRF743/IRFP343	—	—	0.80	Ω	
g_{fs}	Forward Transconductance (2)	5.8	87	—	Ω	$V_{DS} \geq 50V$, $I_D=5.2A$
C_{iss}	Input Capacitance	—	1500	—	pF	$V_{GS}=0V$, $V_{DS}=25V$, $f=1.0\text{MHz}$
C_{oss}	Output Capacitance	—	178	—	pF	
C_{rss}	Reverse Transfer Capacitance	—	75	—	pF	
$t_{d(on)}$	Turn-On Delay Time	—	14	21	ns	$V_{DD}=0.5BV_{DSS}$, $I_D=10A$, $Z_O=9.1\Omega$ (MOSFET switching times are essentially independent of operating temperature)
t_r	Rise Time	—	27	41	ns	
$t_{d(off)}$	Turn-Off Delay Time	—	50	75	ns	
t_f	Fall Time	—	24	36	ns	
Q_g	Total Gate Charge (Gate-Source Plus Gate-Drain)	—	42	63	nC	$V_{GS}=10V$, $I_D=10A$, $V_{DS}=0.8 \text{ Max. Rating}$ (Gate charge is essentially independent of operating temperature.)
Q_{gs}	Gate-Source Charge	—	6.0	9.0	nC	
Q_{gd}	Gate-Drain ("Miller") Charge	—	21	32	nC	

THERMAL RESISTANCE

Symbol	Characteristic		IRF740-3	IRFP340-3	Unit	
R_{thJC}	Junction-to-Case	MAX	1.0	1.0	K/W	
R_{thCS}	Case-to-Sink	TYP	0.5	0.24	K/W	Mounting surface flat, smooth, and greased
R_{thJA}	Junction-to-Ambient	MAX	80	40	K/W	Free Air Operation

Notes: (1) $T_J=25^\circ\text{C}$ to 150°C

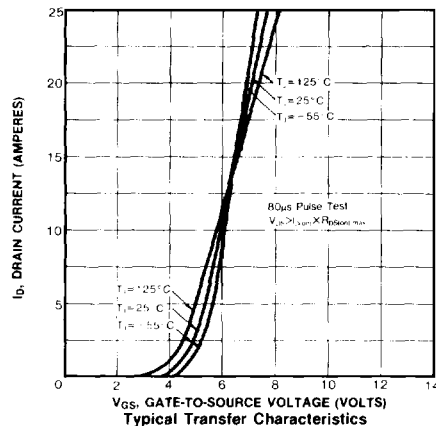
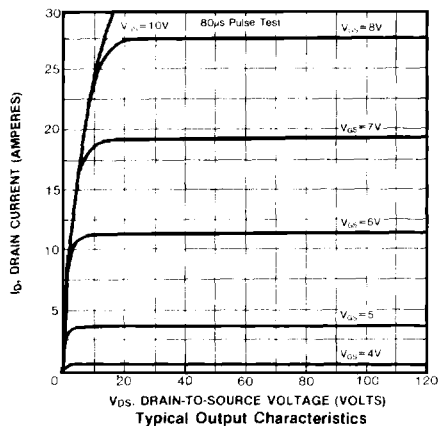
(2) Pulse test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$

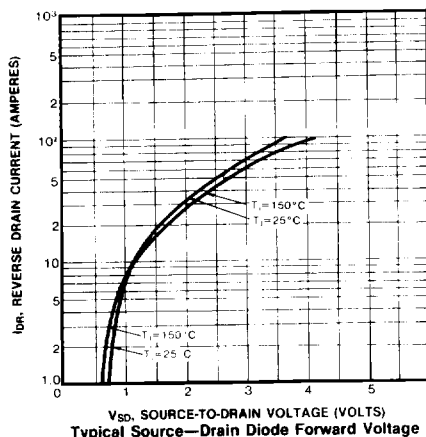
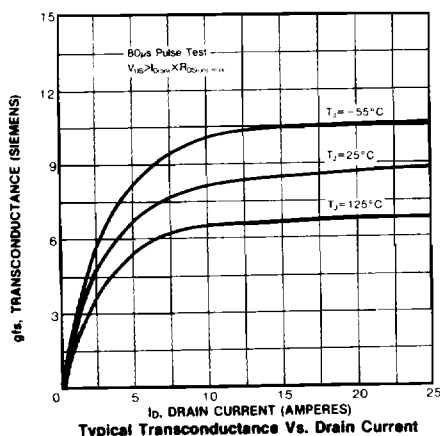
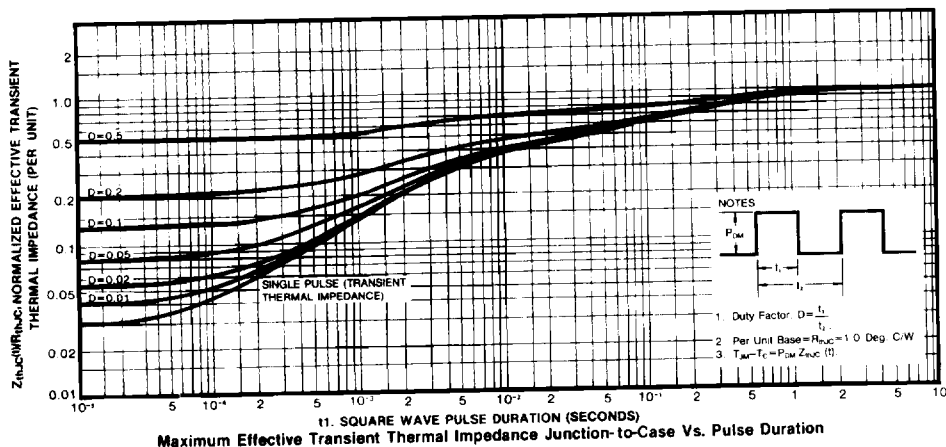
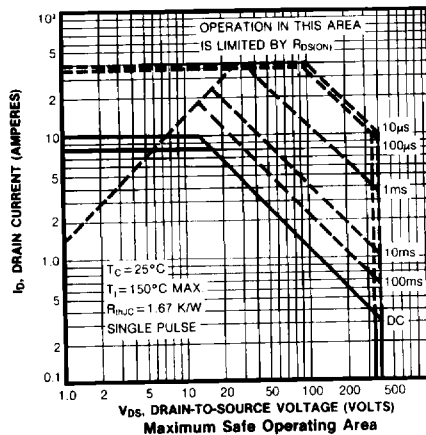
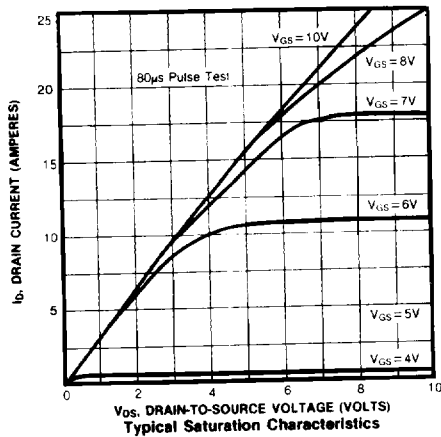
(3) Repetitive rating: Pulse width limited by max. junction temperature

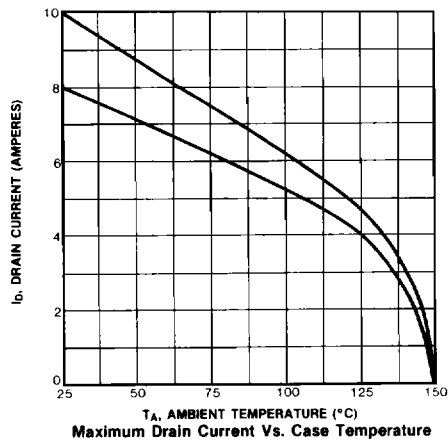
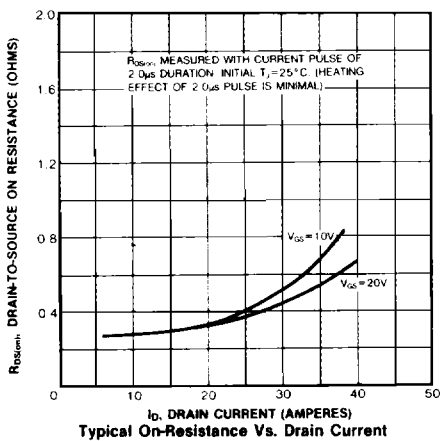
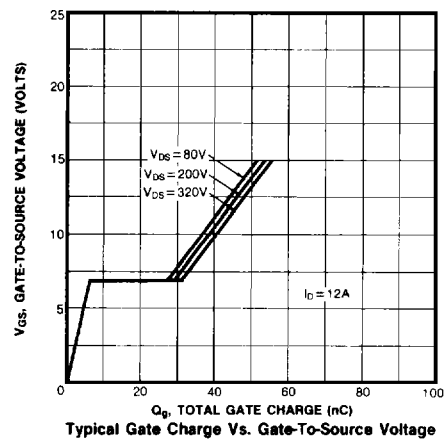
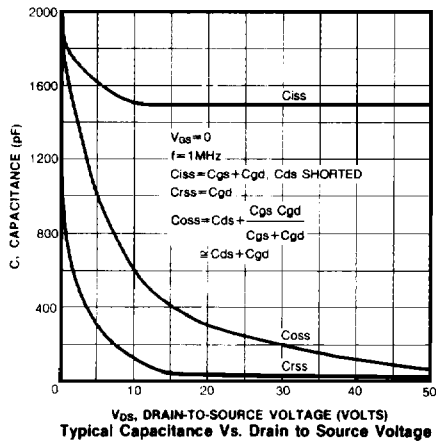
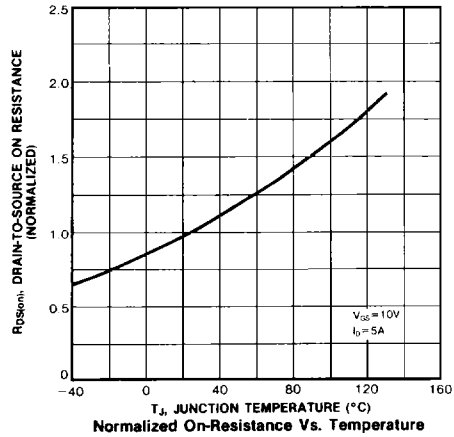
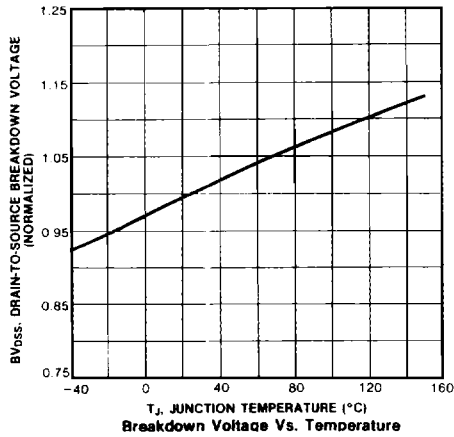
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode) IRF740/IRFP340 IRF741/IRFP341	—	—	10	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
	IRF742/IRFP342 IRF743/IRFP343	—	—	8.0	A	
I_{SM}	Pulse Source Current(Body Diode)(3) IRF740/IRFP340 IRF741/IRFP341	—	—	40	A	
	IRF742/IRFP342 IRF743/IRFP343	—	—	32	A	
V_{SD}	Diode Forward Voltage (2) IRF740/IRFP340 IRF741/IRFP341	—	—	2.0	V	$T_C=25^\circ\text{C}$, $I_S=10\text{A}$, $V_{GS}=0\text{V}$
	IRF742/IRFP342 IRF743/IRFP343	—	—	1.9	V	$T_C=25^\circ\text{C}$, $I_S=8.0\text{A}$, $V_{GS}=0\text{V}$
t_{rr}	Reverse Recovery Time	—	370		ns	$T_J=25^\circ\text{C}$, $I_F=10\text{A}$, $dI_F/dt=100\text{A}/\mu\text{S}$

Notes: (1) $T_J=25^\circ\text{C}$ to 150°C (2) Pulse test: Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
(3) Repetitive rating: Pulse with limited by max. junction temperature

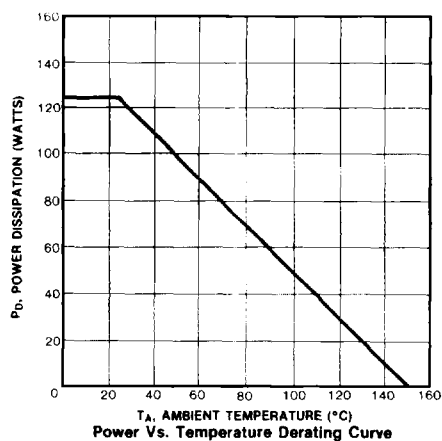






IRF740/741/742/743
IRFP340/341/342/343

N-CHANNEL
POWER MOSFETS



2

SAMSUNG

ELECTRONICS