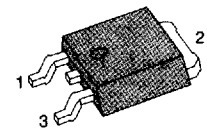
FEATURES

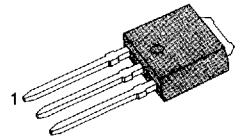
- Lower $R_{DS(ON)}$
- Improved inductive ruggedness
- Fast switching times
- Rugged polysilicon gate cell structure
- Lower input capacitance
- Extended safe operating area
- Improved high temperature reliability

D-PAK



1.Gate 2.Drain 3.Source
IRFR014/10

I-PAK



1.Gate 2.Drain 3.Source
IRFU014/10

PRODUCT SUMMARY

Part Number	V_{DS}	$R_{DS(on)}$	I_D
IRFR014/U014	60V	0.20Ω	8.2A
IRFR010/U010	50V	0.20Ω	8.2A

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ABSOLUTE MAXIMUM RATINGS

Characteristic	Symbol	IRFR014/U014	IRFR010/U010	Unit
Drain-Source Voltage (1)	V_{DSS}	60	50	Vdc
Drain-Gate Voltage (R_{GS}=1.0MΩ)(1)	V_{DGR}	60	50	Vdc
Gate-Source Voltage	V_{GS}	±20		Vdc
Continuous Drain Current T_C=25 °C	I_D	8.2		Adc
Continuous Drain Current T_C=100 °C	I_D	5.2		Adc
Drain Current - Pulsed (3)	I_{DM}	33		Adc
Gate Current - Pulsed	I_{GM}	±1.5		Adc
Single Pulsed Avalanche Energy (4)	E_{AS}	1.4		mJ
Avalanche Current	I_{AS}	8.2		A
Total Power Dissipation at T_C=25 °C Derate above 25 °C	P_D	25 0.20		Watts W/ °C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-55 to +150		°C
Maximum Lead Temp. for Soldering Purposes, 1/8" from case for 5 seconds	T_L	300		°C

Notes : (1) T_J=25°C to 150°C
(2) Pulse test : Pulse width≤300μs, Duty Cycle≤2%
(3) Repetitive rating : Pulse width limited by max. junction temperature
(4) L=50μH, V_{dd}=25V, R_G=25Ω , Starting T_J=25°C

SAMSUNG ELECTRONICS

ELECTRICAL CHARACTERISTICS (Tc=25°C unless otherwise specified)

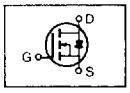
Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
	Drain-Source Breakdown Voltage					
BVDSS	IRFR014/U014	60	-	-	V	VGS=0V, ID=250μA
	IRFR010/U010	50	-	-	V	
VGS(th)	Gate Threshold Voltage	2.0	-	4.0	V	VDS=VGS, ID=250μA
IGSS	Gate-Source Leakage Forward	-	-	100	nA	VGS=20V
IGSS	Gate-Source Leakage Reverse	-	-	-100	nA	VGS=-20V
IDSS	Zero Gate Voltage Drain Current	-	-	250	μA	VDS=Max. Rating, VGS=0V
		-	-	1000	μA	VDS=0.8 Max. Rating, VGS=0V, Tc=125°C
RDS(on)	Static Drain-Source on Resistance(2)	-	-	0.20	Ω	VGS=10V, ID=4.1A
gfs	Forward Transconductance (2)	2.1	-	-	℧	VDS≥50V, ID=4.1A
Ciss	Input Capacitance	-	358	-	pF	VGS=0V
Coss	Output Capacitance	-	134	-	pF	VDS=25V
Crss	Reverse Transfer Capacitance	-	55	-	pF	f=1.0MHz
td(on)	Turn-On Delay Time	-	-	17	ns	VDD=0.5 BVDSS, ID=8.2A, ZO=24 Ω
tr	Rise Time	-	-	50	ns	(MOSFET switching times are essentially
td(off)	Turn-Off Delay Time	-	-	18	ns	independent of operating temperature)
tf	Fall Time	-	-	35	ns	
Qg	Total Gate Charge (Gate-Source Plus Gate-Drain)	-	-	13.0	nC	VGS=10V, ID=8.2A, VDS=0.8 Max. Rating (Gate charge is essentially independent of
Qgs	Gate-Source Charge	-	3.8	-	nC	operating temperature)
Qgd	Gate-Drain ("Miller") Charge	-	4.8	-	nC	

THERMAL RESISTANCE

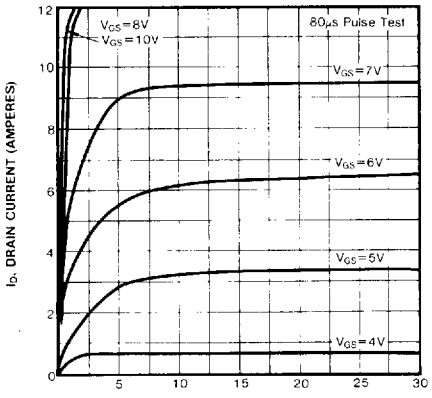
Symbol	Characteristics		All	Units	Remark
RthJC	Junction-to-Case	MAX	5.0	K/W	
RthCS	Case-to-Sink	TYP	1.7	K/W	Mounting surface flat, smooth and greased
RthJA	Junction-to-Ambient	MAX	110	K/W	Free Air Operation

Notes : (1) TJ=25°C to 150°C
(2) Pulse test : Pulse width≤300μs, Duty Cycle≤2%
(3) Repetitive rating : Pulse width limited by max. junction temperature

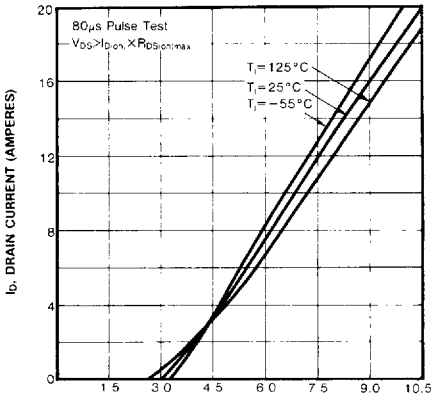
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Symbol	Characteristic	Min	Typ	Max	Units	Test Conditions
I_S	Continuous Source Current (Body Diode)	-	-	8.2	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
I_{SM}	Pulse Source Current (Body Diode) (3)	-	-	33	A	
V_{SD}	Diode Forward Voltage	-	-	1.6	V	T_J=25°C, I_S=8.2A, V_{GS}=0V
t_{rr}	Reverse Recovery Time	-	-	190	ns	T_J=25°C, I_F=8.2A, dI_F/dt=100A/μS

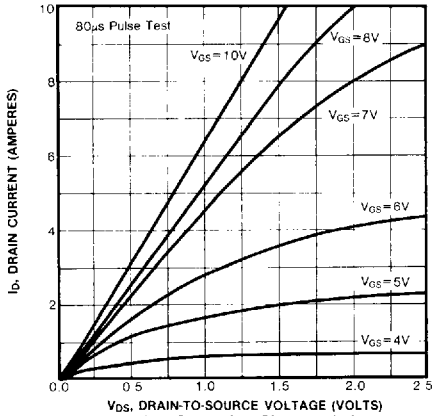
Notes : (1) T_J=25°C to 150°C
(2) Pulse test : Pulse width≤300μs, Duty Cycle≤2%
(3) Repetitive rating : Pulse width limited by max. junction temperature



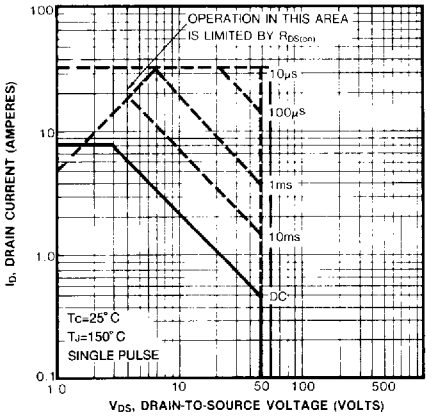
Typical Output Characteristics



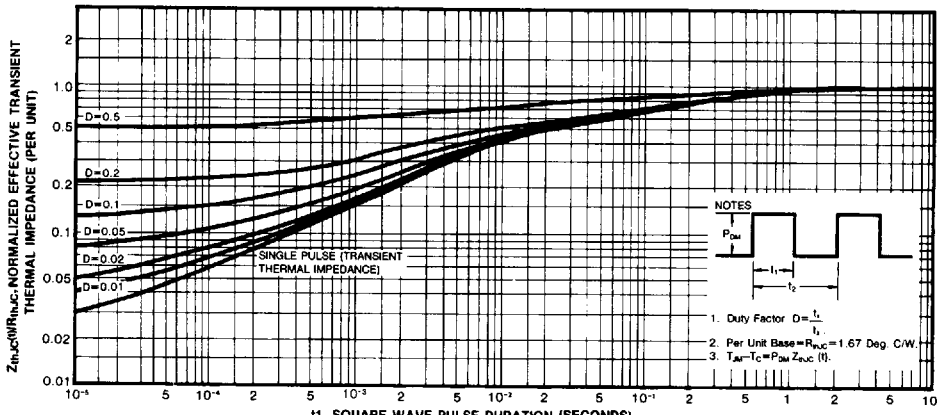
Typical Transfer Characteristics



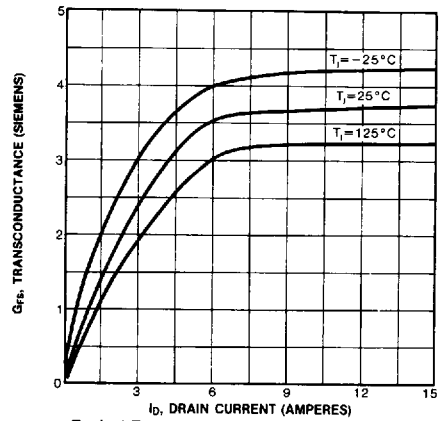
Typical Saturation Characteristics



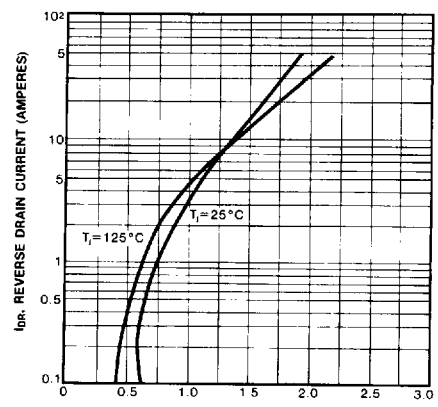
Maximum Safe Operating Area



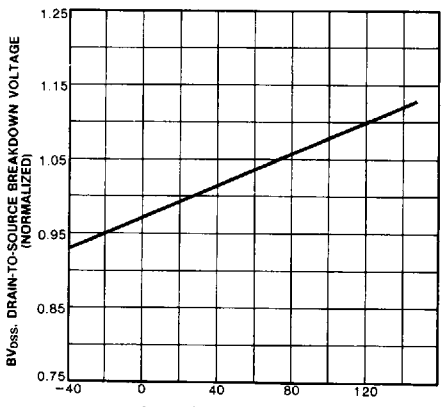
Maximum Effective Transient Thermal Impedance Junction-to-Case Vs. Pulse Duration



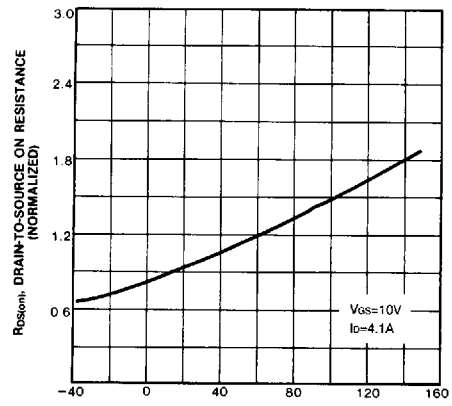
Typical Transcounductance Vs. Drain Current



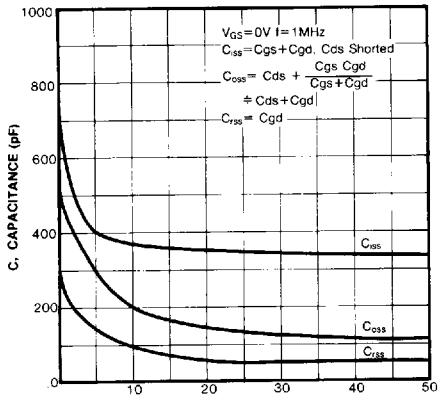
Typical Source—Drain Diode Forward Voltage



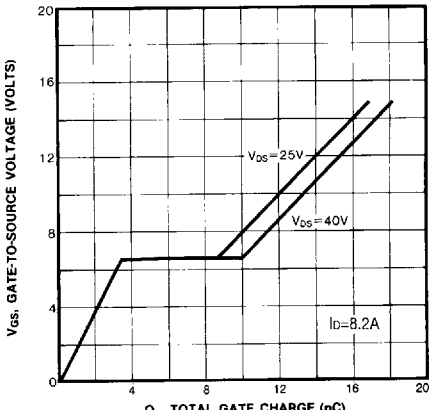
Breakdown Voltage Vs. Temperature



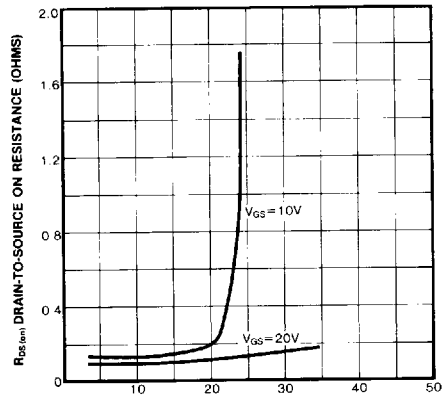
Normalized On-Resistance Vs. Temperature



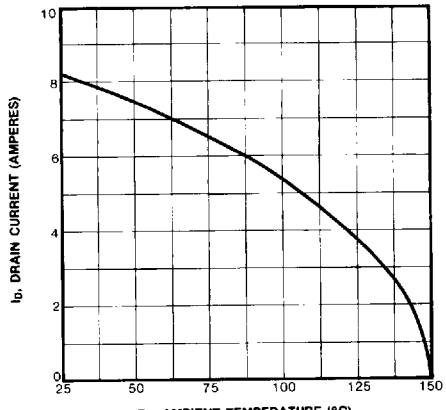
Typical Capacitance Vs. Drain to Source Voltage



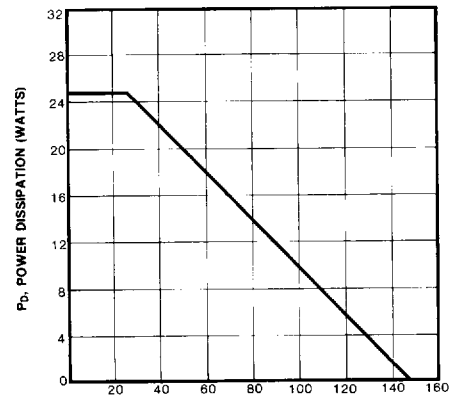
Typical Gate Charge Vs. Gate-To-Source Voltage



Typical On-Resistance Vs. Drain Current



Maximum Drain Current Vs. Case Temperature



Power Vs. Temperature Derating Curve