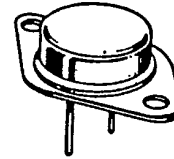


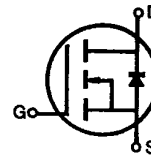
IRF140/141/142/143**N-CHANNEL
POWER MOSFETS****FEATURES**

- 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 (High current)

TO-3

**PRODUCT SUMMARY**

Part Number	V _{DS}	R _{DS(on)}	I _D
IRF140	100V	0.085Ω	27A
IRF141	60V	0.085Ω	27A
IRF142	100V	0.11Ω	24A
IRF143	60V	0.11Ω	24A

**MAXIMUM RATINGS**

Characteristic	Symbol	IRF140	IRF141	IRF142	IRF143	Unit
Drain-Source Voltage (1)	V _{DSS}	100	60	100	60	Vdc
Drain-Gate Voltage (R _{GS} =1.0MΩ) (1)	V _{DGR}	100	60	100	60	Vdc
Gate-Source Voltage	V _{GS}	±20				Vdc
Continuous Drain Current T _C =25°C	I _D	27	27	24	24	Adc
Continuous Drain Current T _C =100°C	I _D	17	17	15	15	Adc
Drain Current—Pulsed (3)	I _{DM}	108	108	96	96	Adc
Gate Current—Pulsed	I _{GM}	±1.5				Adc
Total Power Dissipation @ T _C =25°C	P _D	125				Watts
Derate above 25°C		1.0				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



SAMSUNG SEMICONDUCTOR

IRF140/141/142/143

N-CHANNEL
POWER MOSFETSELECTRICAL CHARACTERISTICS (T_C=25°C unless otherwise specified)

Characteristic	Symbol	Type	Min	Typ	Max	Units	Test Conditions
Drain-Source Breakdown Voltage	BV _{DSS}	IRF140	100	—	—	V	V _{GS} =0V
		IRF142	—	—	—	—	—
		IRF141 IRF143	60	—	—	V	I _D =250μA
Gate Threshold Voltage	V _{GS(th)}	ALL	2.0	—	4.0	V	V _{DS} =V _{GS} , I _D =250μA
Gate-Source Leakage Forward	I _{GSS}	ALL	—	—	100	nA	V _{GS} =20V
Gate-Source Leakage Reverse	I _{GSS}	ALL	—	—	-100	nA	V _{GS} =-20V
Zero Gate Voltage Drain Current	I _{DSS}	ALL	—	—	250	μA	V _{DS} =Max. Rating, V _{GS} =0V
			—	—	1000	μA	V _{DS} =Max. Rating×0.8, V _{GS} =0V, T _C =125°C
On-State Drain-Source Current (2)	I _{D(on)}	IRF140 IRF141	27	—	—	A	V _{DS} >I _{D(on)} ×R _{DS(on)} max., V _{GS} =10V
		IRF142 IRF143	24	—	—	A	
Static Drain-Source On-State Resistance (2)	R _{DS(on)}	IRF140 IRF141	—	0.06	0.085	Ω	V _{GS} =10V, I _D =15A
		IRF142 IRF143	—	0.09	0.11	Ω	
Forward Transconductance (2)	g _{fs}	ALL	6.0	10.5	—	S	V _{DS} >I _{D(on)} ×R _{DS(on)} max., I _D =15A
Input Capacitance	C _{iss}	ALL	—	1320	1600	pF	V _{GS} =0V, V _{DS} =25V, f=1.0MHz
Output Capacitance	C _{oss}	ALL	—	600	800	pF	
Reverse Transfer Capacitance	C _{rss}	ALL	—	250	300	pF	
Turn-On Delay Time	t _{d(on)}	ALL	—	—	30	ns	V _{DD} =0.5BV _{DSS} , I _D =15A, Z _O =4.7 Ω (MOSFET switching times are essentially independent of operating temperature.)
Rise Time	t _r	ALL	—	—	60	ns	
Turn-Off Delay Time	t _{d(off)}	ALL	—	—	80	ns	
Fall Time	t _f	ALL	—	—	30	ns	
Total Gate Charge (Gate-Source Plus Gate-Drain)	Q _g	ALL	—	39	60	nC	V _{GS} =10V, I _D =34A, V _{DS} =0.8 Max. Rating (Gate charge is essentially independent of operating temperature.)
Gate-Source Charge	Q _{gs}	ALL	—	12	—	nC	
Gate-Drain ("Miller") Charge	Q _{gd}	ALL	—	27	—	nC	

THERMAL RESISTANCE

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

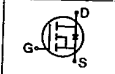
- Notes: (1) T_J=25°C to 150°C
(2) Pulse test: Pulse width≤300μs, Duty Cycle≤2%
(3) Repetitive rating: Pulse width limited by max. junction temperature



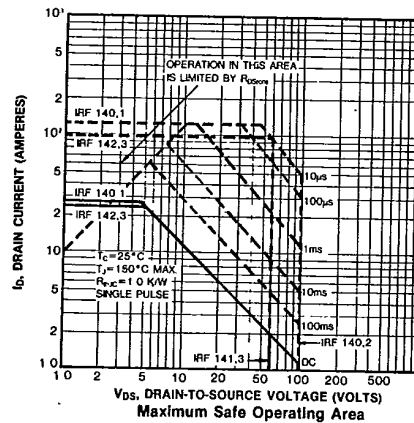
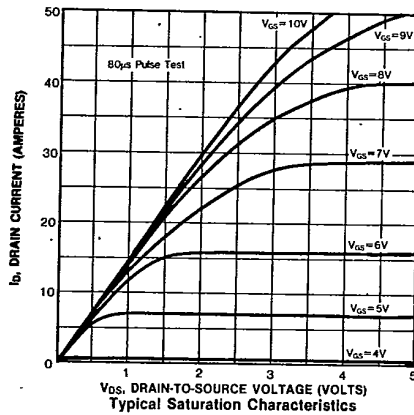
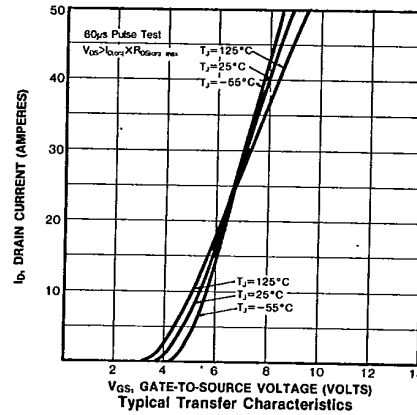
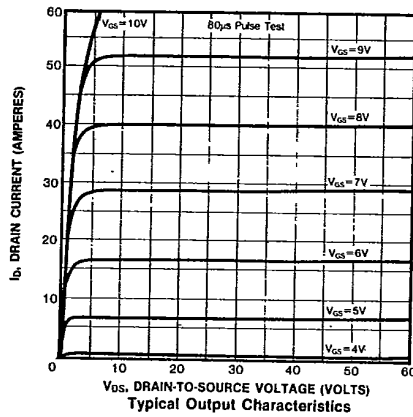
IRF140/141/142/143

N-CHANNEL POWER MOSFETS

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

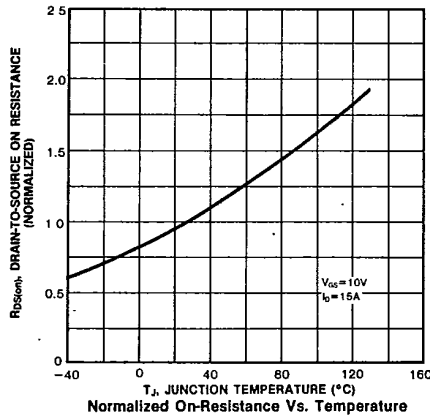
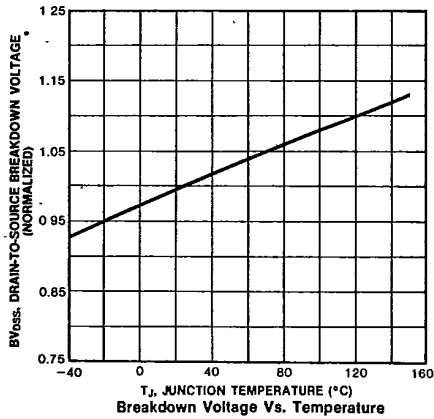
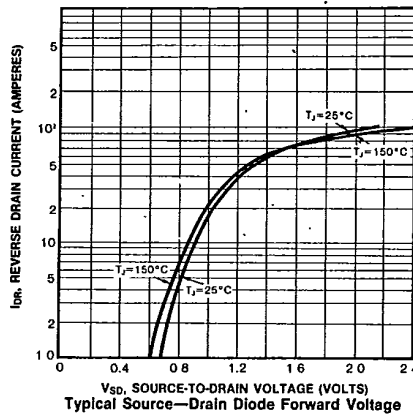
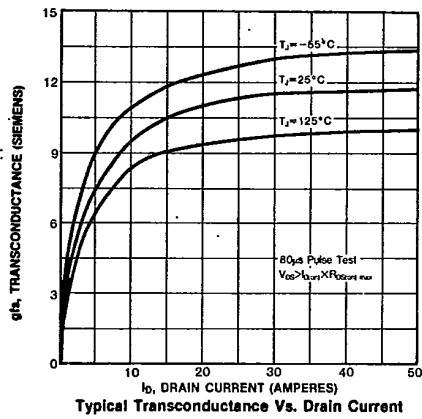
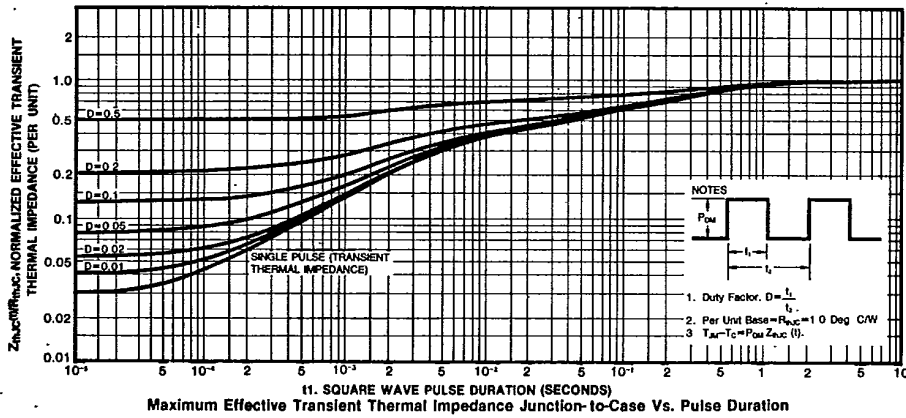
Characteristic	Symbol	Type	Min	Typ	Max	Units	Test Conditions
Continuous Source Current (Body Diode)	I _S	IRF140	—	—	27	A	Modified MOSFET symbol showing the integral reverse P-N junction rectifier 
		IRF141	—	—	27	A	
		IRF142 IRF143	—	—	24	A	
Pulse Source Current (Body Diode) (3)	I _{SM}	IRF140	—	—	108	A	
		IRF141	—	—	108	A	
		IRF142 IRF143	—	—	96	A	
Diode Forward Voltage (2)	V _{SD}	IRF140	—	—	2.5	V	T _C =25°C, I _S =27A, V _{GS} =0V
		IRF142 IRF143	—	—	2.3	V	T _C =25°C, I _S =24A, V _{GS} =0V
Reverse Recovery Time	t _{rr}	ALL	—	500	—	ns	T _J =150°C, I _F =27A, di/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



IRF140/141/142/143

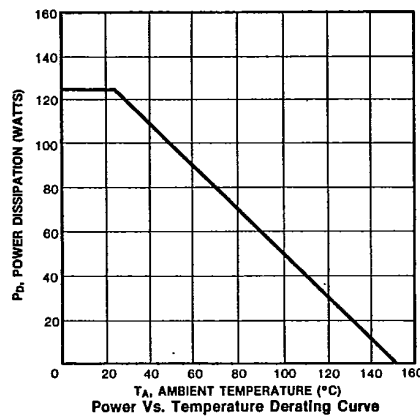
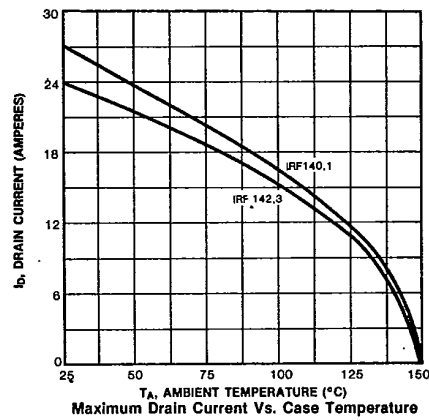
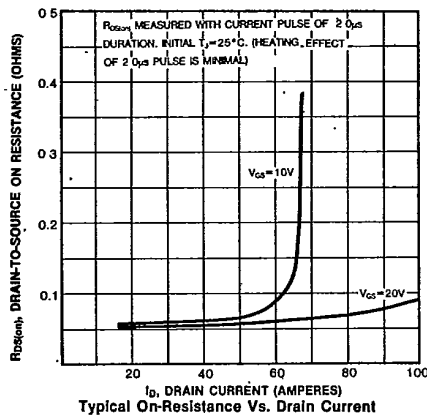
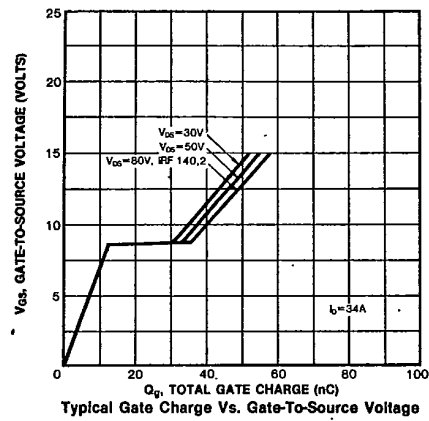
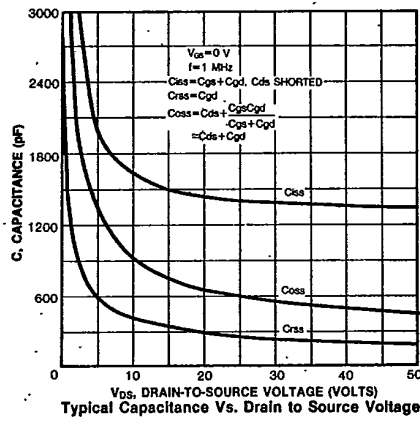
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