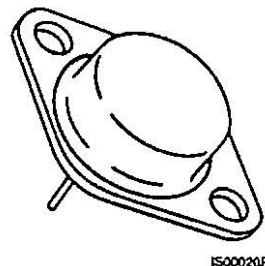


Description

These devices are n-channel, enhancement mode, power MOSFETs designed especially for high voltage, high speed applications, such as off-line switching power supplies, UPS, AC and DC motor controls, relay and solenoid drivers.

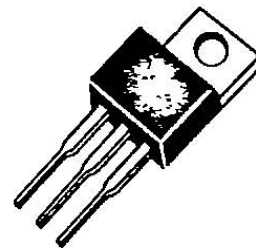
- V_{GS} Rated at $\pm 20V$
- Silicon Gate for Fast Switching Speeds
- I_{DSS} , $V_{DS(on)}$, S_{OA} and $V_{GS(th)}$ Specified at Elevated Temperature
- Rugged

TO-204AA



IS00020F

TO-220AB



IS00010F

IRF340
 IRF341
 IRF342
 IRF343
 MTM8N35
 MTMT8N40

IRF740
 IRF741
 IRF742
 IRF743

Maximum Ratings

Symbol	Characteristic	Rating IRF340/342 IRF740/742 MTM8N40	Rating IRF341/343 IRF741/743 MTM8N35	Unit
V_{DSS}	Drain to Source Voltage	400	350	V
V_{DGR}	Drain to Gate Voltage $R_{GS}=1.0M \Omega$	400	350	V
V_{GS}	Gate to Source Voltage	± 20	± 20	V
T_J, T_{stg}	Operating Junction Temperature Storage Temperature	-55 to +150	-55 to +150	
T_L	Maximum Lead Temperature for Soldering Purposes, 1/8" From Case for 5S	275	275	

Maximum On-State Characteristics

		IRF340/341 IRF740/741	IRF342/343 IRF742/743	MTM8N35 MTM8N40	
$R_{DS(on)}$	Static Drain-to-Source On Resistance	0.55	0.80	0.55	Ω
I_D	Drain Current				A
	Continuous	10	8	8	
	Pulsed	40	32	48	

Maximum Thermal Characteristics

$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.0	1.0	0.83	/W
P_D	Total Power Dissipation at $T_c=25$	125	125	150	W

Notes

For Information concerning connection diagram and package outline, refer to Section 7.



IRF340-343/IRF740-743 T-39-13
MTM8N35/8N40
N-Channel Power MOSFETs
10A, 350V/400V

Electrical Characteristics (Tc=25 unless otherwise noted)

Symbol	Characteristic	Min	Max	Unit	Test Conditions
Off Characteristics					
V _{(BR)DSS}	Drain-Source Breakdown Voltage1 IRF340/342/740/742 Irf341/343/741/743			V	V _{GS} =0V, I _D =250μA
		400			
		350			
I _{DSS}	Zero Gate Voltage Drain Current		250	μA	V _{DS} =Rated V _{DSS} , V _{GS} =0V
			1000	μA	V _{DS} =0.8 x Rated V _{ds} , V _{GS} =0V, T _c =125
I _{GSS}	Gate-Body Leakage Current IRF340-343 IRF740-743		±100 ±500	nA	V _{GS} =±20V, V _{DS} =0V
On Characteristics					
V _{GS(th)}	Gate Threshold Voltage	2.0	4.0	V	I _D =250μA, V _{DS} =V _{GS}
R _{DS(on)}	Static Drain-Source On-Resistance 2 IRF340/341/740/741 IRF342/343/742/743		0.55 0.80	Ω	V _{GS} =10V, I _D =5.0A
g _{fs}	Forward Transconductance	4.0		S(Ω)	V _{DS} =10V, I _D =5.0A
Dynamic Characteristics					
C _{iss}	Input Capacitance		1600	pF	V _{DS} =25V, V _{GS} =0V f=1.0MHz
C _{oss}	Output Capacitance		450	pF	
C _{rss}	Reverse Transfer Capacitance		150	pF	
Switching Characteristics (T _c =25 , Figures 9, 10)					
t _{d(on)}	Turn-On Delay Time		35	ns	V _{DD} =175V, I _D =5.0A V _{GS} =10V, R _{GEN} =4.7 Ω R _{GS} =4.7 Ω
t _r	Rise Time		15	ns	
t _{d(off)}	Turn-Off Delay Time		90	ns	
t _f	Fall Time		35	ns	
Q _g	Total Gate Charge		60	nC	V _{GS} =10V, I _D =12A V _{DD} =400V
Symbol	Characteristic	TYP	Max	Unit	Test Conditions
Source-Drain Diode Characteristics					
V _{SD}	Diode Forward Voltage IRF340/341/740/741 Irf342/343/742/743		2.0	V	I _S =10A; V _{GS} =0V
			1.9	V	I _S =8A; V _{GS} =0V
t _{rr}	Reverse Recovery Time	600		ns	I _S =10A; dI _S /dt=100A/μS



IRF340-343/IRF740-743 T-39-13
MTM8N35/8N40
N-Channel Power MOSFETs
10A, 350V/400V

Electrical Characteristics (Tc=25 unless otherwise noted)

Symbol	Characteristic	Min	Max	Unit	Test Conditions
Off Characteristics					
V _{(BR)DSS}	Drain-Source Breakdown Voltage ¹ MTM8N40 MTM8N35			V	V _{GS} =0V, I _D =5.0mA
		400			
		350			
I _{DSS}	Zero Gate Voltage Drain Current		0.25	mA	V _{DS} =0.85 x Rated V _{DSS} , V _{GS} =0V
			2.5	mA	V _{DS} =0.85 x Rated V _{DSS} , V _{GS} =0V, T _c =100
I _{GSS}	Gate-Body Leakage Current		±500	nA	V _{GS} =±20V, V _{DS} =0V
On Characteristics					
V _{GS(th)}	Gate Threshold Voltage	2.0	4.5	V	I _D =1.0mA, V _{DS} =V _{GS}
		1.5	4.0	V	I _D =1.0mA, V _{DS} =V _{GS} T _c =100
V _{DS(on)}	Drain-Source On-Voltage ²		2.2	V	V _{GS} =10V; I _D =4.0A
			5.3	V	V _{GS} =10V; I _D =8.0A
			4.4	V	V _{GS} =10V, I _D =4.0A T _c =100
R _{DS(on)}	Static Drain-Source On-Resistance ²		0.55	Ω	V _{GS} =10V, I _D =4.0A
g _{fs}	Forward Transconductance	3.0		S(Ω)	V _{DS} =10V, I _D =4.0A
Dynamic Characteristics					
C _{iss}	Input Capacitance		1800	pF	V _{DS} =25V, V _{GS} =0V F=1.0MHz
C _{oss}	Output Capacitance		350	pF	
C _{rss}	Reverse Transfer Capacitance		150	pF	
Switching Characteristics (T _c =25℃, Figures 9,10) ³					
t _{d(on)}	Turn-On Delay Time		60	ns	V _{DD} =25V, I _D =4.0A V _{GS} =10V, R _{GEN} =50 Ω R _{GS} =50 Ω
t _r	Rise Time		150	ns	
t _{d(off)}	Turn-Off Delay Time		200	ns	
t _f	Fall Time		120	ns	
Q _g	Total Gate Charge		60	nC	V _{GS} =10V, I _D =12A V _{DD} =400V

Notes

1. T_J=+25 to +150
2. Pulse test: Pulse width ≤80μs, Duty cycle≤1%
3. Switching time measurements performed on LEM TR-58 test equipment.

Typical Performance Curves

Figure 1 Output Characteristics

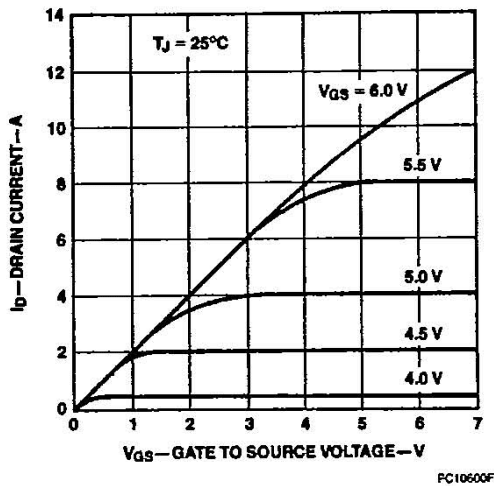


Figure 2 Static Drain to Source Resistance vs Drain Current

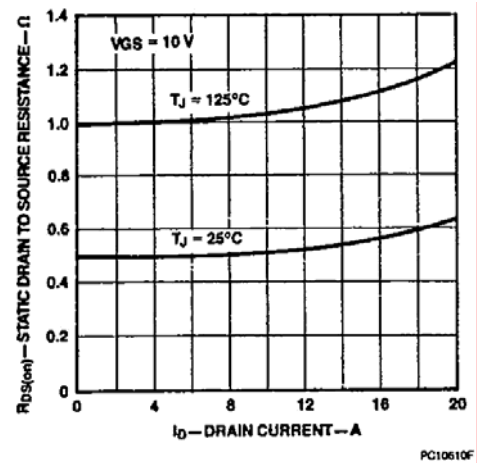


Figure 3 Transfer Characteristics

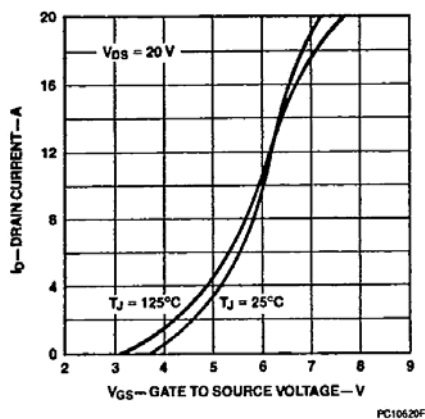


Figure 4 Temperature Variation of Gate to Source Threshold Voltage

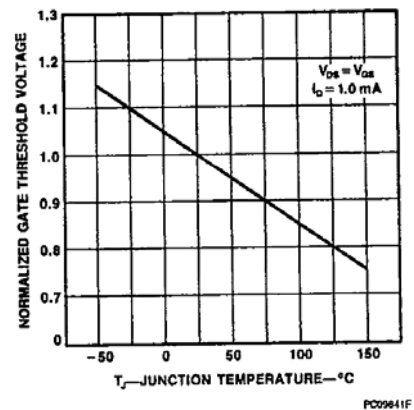


Figure 5 Capacitance vs Drain to Source Voltage

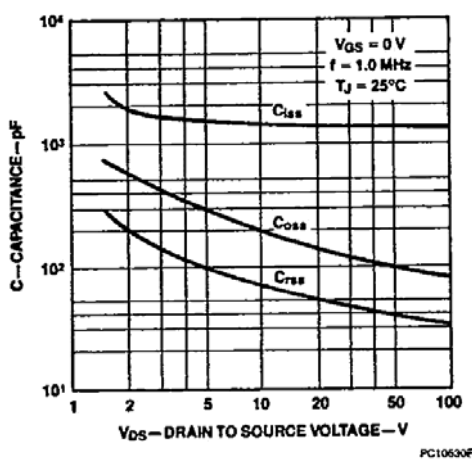
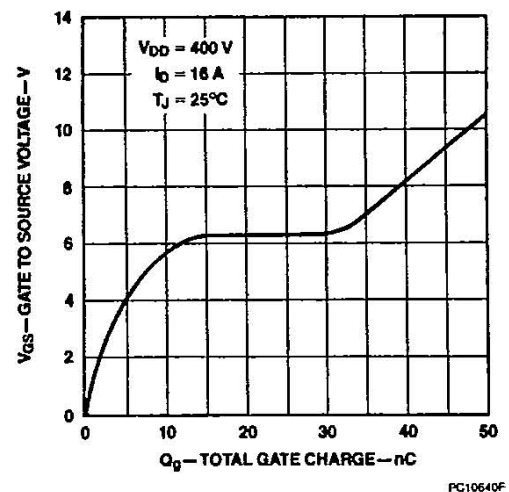
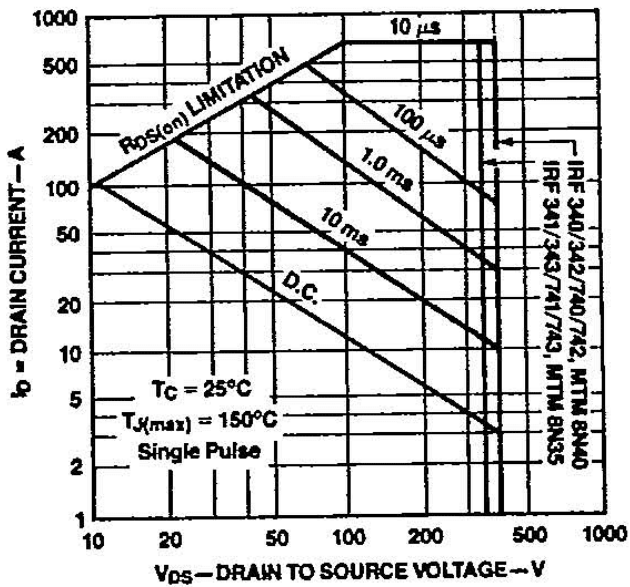


Figure 6 Gate to Source Voltage vs Total Gate Charge



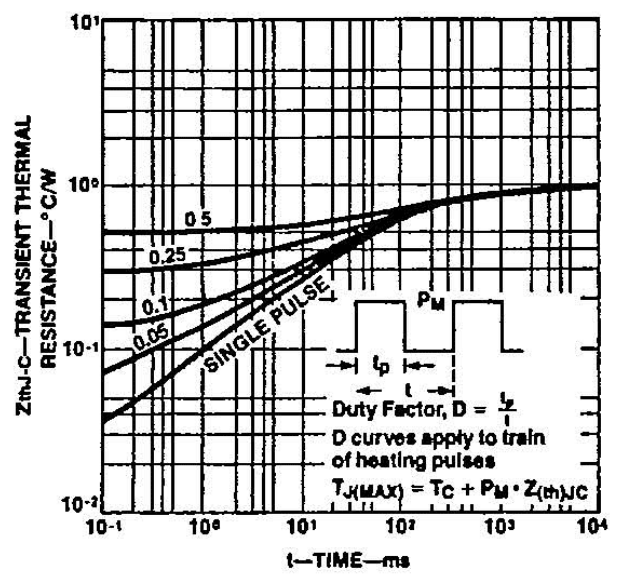
Typical Performance Curves (Cont.)

Figure 7 Forward Biased Safe Operating Area



PC10650F

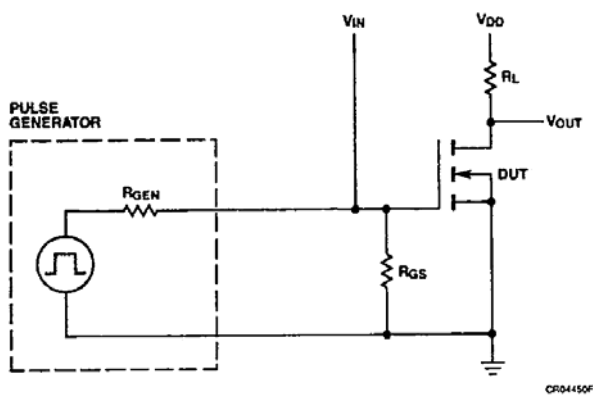
Figure 8 Transient Thermal Resistance vs Time



PC10100F

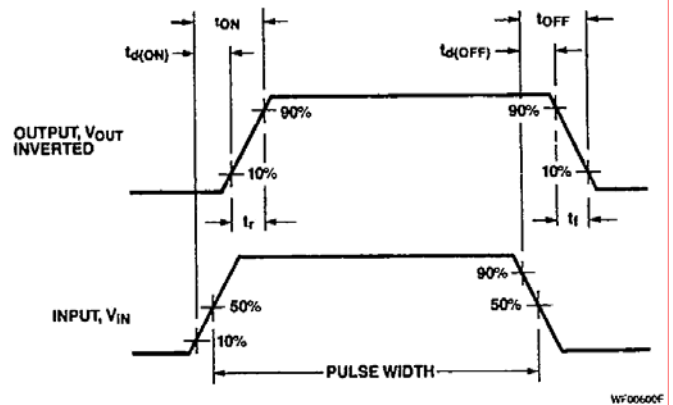
Typical Electrical Characteristics

Figure 9 Switching Test Circuit



CP04150F

Figure 10 Switching Waveforms



WF00600F