Micro Commercial Components

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MCU18N20

N-Channel
Enhancement Mode
Field Effect Transistor

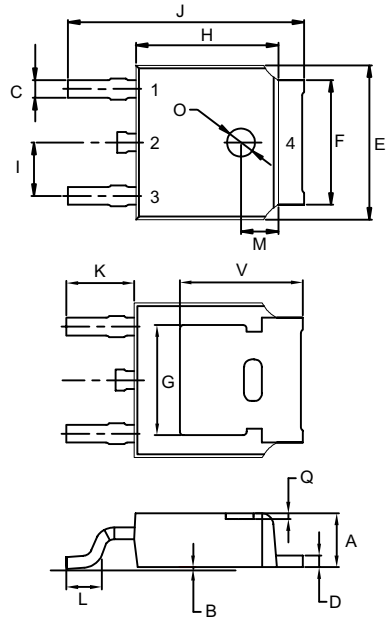
Features

- Fast switching
- Improved dv/dt capability
- Halogen free available upon request by adding suffix "-HF"
- Excellent package for good heat dissipation
- Epoxy meets UL 94 V-0 flammability rating
- Moisture Sensitivity Level 1

Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter		Rating	Unit
V_{DS}	Drain-source Voltage		200	V
I_D	Drain Current-Continuous	Tc=25°C	18	A
		Tc=100°C	11.45	
E_{AS}	Single Pulsed Avalanche Energy(note2)		320	mJ
V_{GS}	Gate-source Voltage		±30	V
I_{DM}	Pulsed Drain Current(note1)		72	A
$R_{\theta JC}$	Thermal Resistance Junction to Case		1.9	℃/W
P_D	Power Dissipation	Tc=25°C	65.8	W
	Linear Derating Factor	Tc>25°C	0.53	W/°C
dV/dt	Peak Diode Recovery Energy(note3)		8	V/ns
T_J	Operating Junction Temperature		-55 to +150	℃
T_{STG}	Storage Temperature		-55 to +150	℃

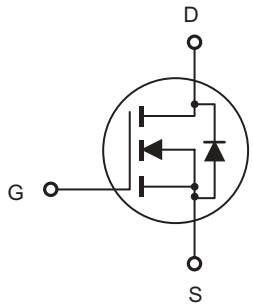
DPAK



1.GATE
2.DRAIN
3.SOURCE

DIMENSIONS					
	INCHES		MM		
DIM	MIN	MAX	MIN	MAX	NOTE
A	0.087	0.094	2.20	2.40	
B	0.000	0.005	0.00	0.13	
C	0.026	0.034	0.66	0.86	
D	0.018	0.023	0.46	0.58	
E	0.256	0.264	6.50	6.70	
F	0.201	0.215	5.10	5.46	
G	0.190		4.83		
H	0.236	0.244	6.00	6.20	
I	0.086	0.094	2.18	2.39	
J	0.386	0.409	9.80	10.40	
K	0.114		2.90		
L	0.055	0.067	1.40	1.70	
M	0.063		1.60		
O	0.043	0.051	1.10	1.30	
Q	0.000	0.012	0.00	0.30	
	0.211		5.35		

Internal Block Diagram



Electrical Characteristics T_C=25℃ unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V,I_D = 250mA	200	-	-	V
$\triangle V_{(BR)DSS}$ /$\triangle T_J$	Breakdown Voltage Temperature Coefficient	Reference to 25℃, I_D = 250μA	-	0.3	-	V/℃
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = 200V, V_{GS} = 0V	-	-	1	μA
		V_{DS} = 160V, T_C = 125℃	-	-	10	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS} = 0V, V_{GS} = ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage note4	V_{DS} = V_{GS}, I_D = 250μA	1	-	3	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	V_{GS} =10V, I_D = 9A	-	0.136	0.16	Ω
g_{FS}	Forward Transconductance	V_{DS} =30V, I_D = 9A	-	8	-	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	-	836	-	pF
C_{oss}	Output Capacitance		-	81.2	-	pF
C_{rss}	Reverse Transfer Capacitance		-	3.81	-	pF
Q_g	Total Gate Charge	V_{DD} = 160V, I_D = 18A, V_{GS} = 10V	-	17.7	-	nC
Q_{gs}	Gate-Source Charge		-	3.9	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	5.2	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD} = 100V, I_D = 18A, R_G = 5Ω, V_{GS} = 10V	-	12.3	-	ns
t_r	Turn-On Rise Time		-	21.1	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	22.5	-	ns
t_f	Turn-Off Fall Time		-	7.7	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	18	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	72	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S = 9A	-	-	1.5	V
t_{rr}	Reverse Recovery Time	V_{GS} = 0V, I_F = 18A, di/dt =100A/μs	-	235	-	ns
Q_{rr}	Reverse Recovery Charge		-	1045	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L = 10mH, I_{AS} = 8A, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25℃
3. I_{SD} ≤ 18A, di/dt ≤ 200A/μs, V_{DD} ≤ B_{VDSS}, Starting T_J = 25℃
4. Pulse width ≤ 300μs; duty cycle ≤ 2%.

Typical Characteristics

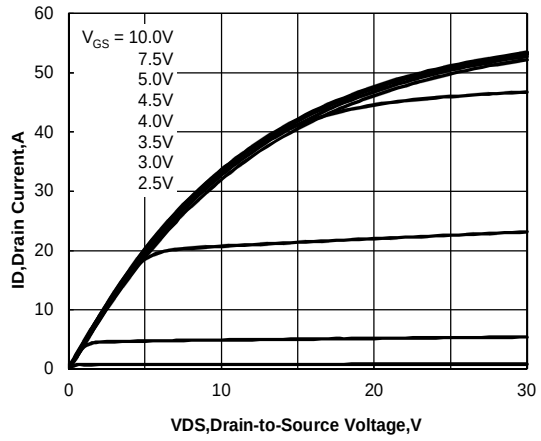


Figure 1. Output Characteristics

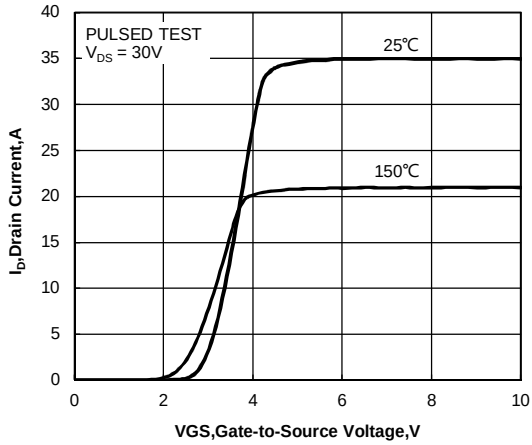


Figure 2. Transfer Characteristics

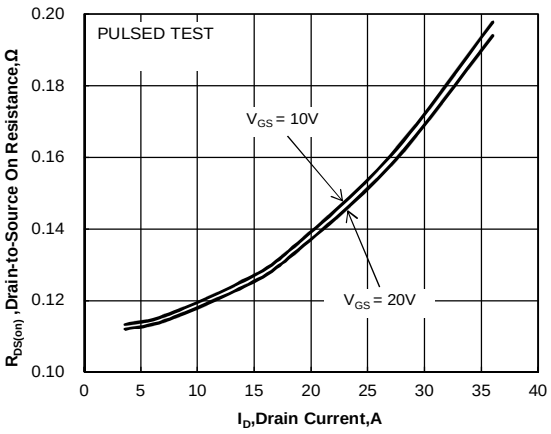


Figure 3. Drain-to-Source On Resistance vs. Drain Current and Gate Voltage

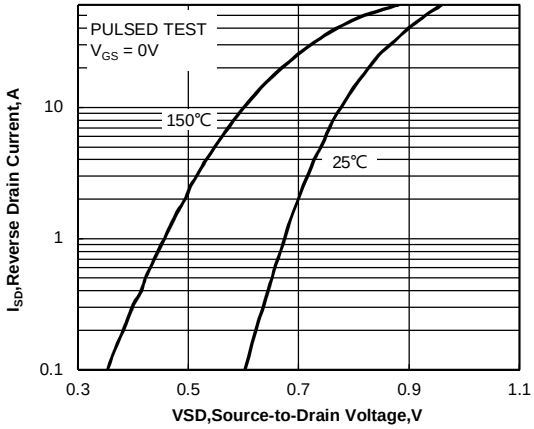


Figure 4. Body Diode Forward Voltage vs. Source Current and Temperature

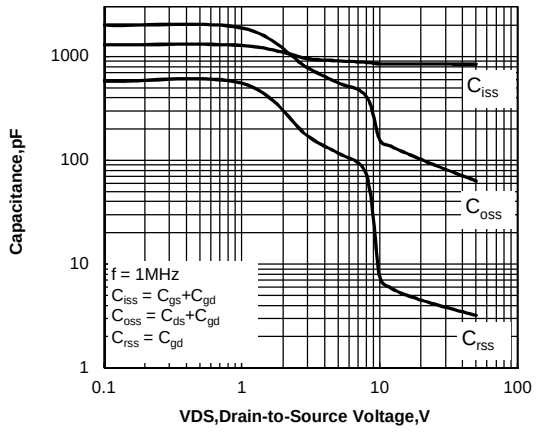


Figure 5. Capacitance Characteristics

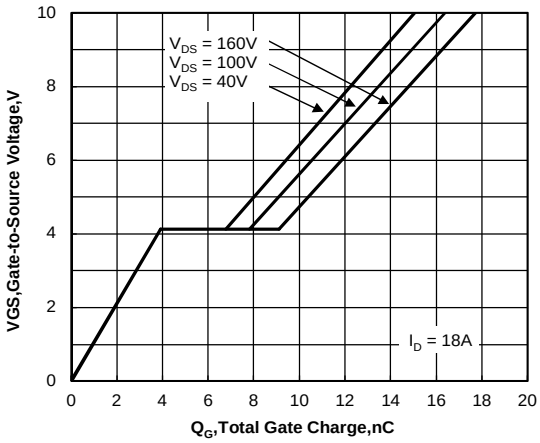


Figure 6. Gate Charge Characteristics

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Ordering Information :

Device	Packing
Part Number-TP	Tape&Reel:2.5Kpcs/Reel

Note : Adding "-HF" suffix for halogen free, eg. Part Number-TP-HF

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