



Micro Commercial Components



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MCU18N10

N-Channel Enhancement Mode Field Effect Transistor

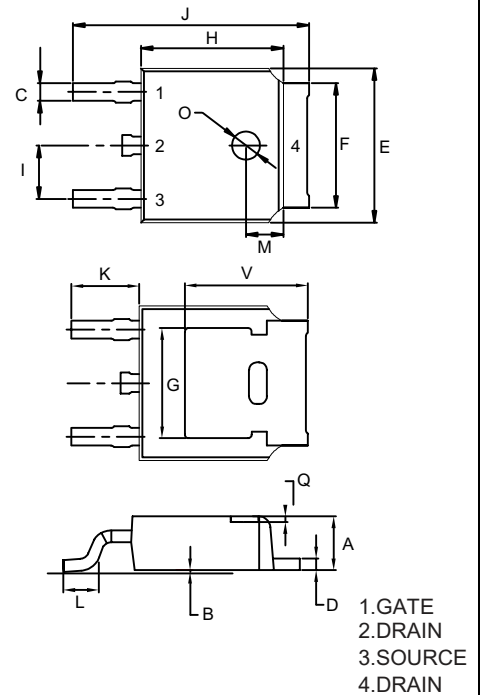
Features

- 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

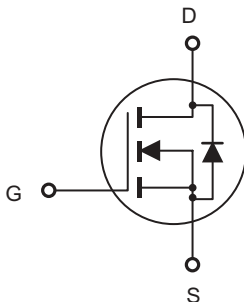
Maximum Ratings @ 25°C Unless Otherwise Specified

Symbol	Parameter	Rating	Unit
V _{DS}	Drain-source Voltage	100	V
I _D	Drain Current-Continuous	T _c =25°C	18
		T _c =100°C	12.6
E _{AS}	Single Pulsed Avalanche Energy(note2)	20	mJ
V _{GS}	Gate-source Voltage	±20	V
I _{DM}	Pulsed Drain Current(note1)	72	A
R _{θJC}	Thermal Resistance Junction to Case	3.2	°C/W
P _D	Maximum Power Dissipation	47	W
T _J	Operating Junction Temperature	-55 to +150	°C
T _{STG}	Storage Temperature	-55 to +150	°C

DPAK



Internal Block Diagram



DIM	DIMENSIONS				NOTE
	INCHES		MM		
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		

Electrical Characteristics $T_C=25^\circ\text{C}$ unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
On / Off States						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current($T_C=25^\circ\text{C}$)	$V_{DS} = 100V, V_{GS} = 0V$	-	-	1	μA
I_{DSS}	Zero Gate Voltage Drain Current($T_C=125^\circ\text{C}$)	$V_{DS} = 100V, V_{GS} = 0V$	-	-	5	μA
I_{GSS}	Gate to Body Leakage Current	$V_{DS} = 0V, V_{GS} = \pm 20V$	-	-	± 100	nA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	2	3	V
$R_{DS(on)}$	Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 4.5A$	-	0.035	0.046	Ω
Dynamic Characteristics						
g_{FS}	Forward Transconductance	$V_{DS} = 5V, I_D = 4.5A$	5	-	-	S
C_{iss}	Input Capacitance	$V_{DS} = 50V, V_{GS} = 0V,$ $f = 1.0MHz$	-	1380	-	pF
C_{oss}	Output Capacitance		-	88	-	pF
C_{rss}	Reverse Transfer Capacitance		-	60	-	pF
Q_g	Total Gate Charge	$V_{DS} = 50V, I_D = 4.5A,$ $V_{GS} = 10V$	-	26.8	-	nC
Q_{gs}	Gate-Source Charge		-	6.4	-	nC
Q_{gd}	Gate-Drain("Miller") Charge		-	12.4	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DS}=50V, R_L=8.6\Omega$ $V_{GS}=10V, R_G=3\Omega$	-	7	-	ns
t_r	Turn-On Rise Time		-	12	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	24	-	ns
t_f	Turn-Off Fall Time		-	11	-	ns
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current(Body Diode)		-	18	-	A
I_{SDM}	Pulsed Source-Drain Current(Body Diode)		-	72	-	A
V_{SD}	Forward On Voltage (note 3)	$T_J=25^\circ\text{C}, I_{SD}=1A, V_{GS}=0V$	-	0.75	1	V
t_{rr}	Reverse Recovery Time(note 3)	$T_J=25^\circ\text{C}, I_F=4.5A$ $di/dt=500A/\mu s$	-	22	-	ns
Q_{rr}	Reverse Recovery Charge (note3)		-	28	-	nC
t_{on}	Forward Turn-on Time	Intrinsic turn-on time is negligible(turn-on is dominated by L_S+L_D)				

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. EAS Condition: $T_J = 25^\circ\text{C}$, $V_{DD} = 50V$, $V_G = 10V$, $R_G = 25\Omega$
3. Pulse Test:: Pulse width $\leq 300\mu s$; duty cycle $\leq 1.5\%$. Starting $T_J=25^\circ\text{C}$

Typical Characteristics

Figure1. On-Region Characteristics

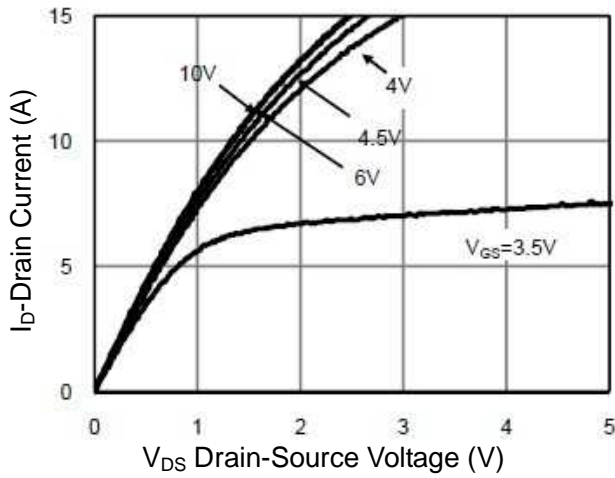


Figure 2: Transfer Characteristics

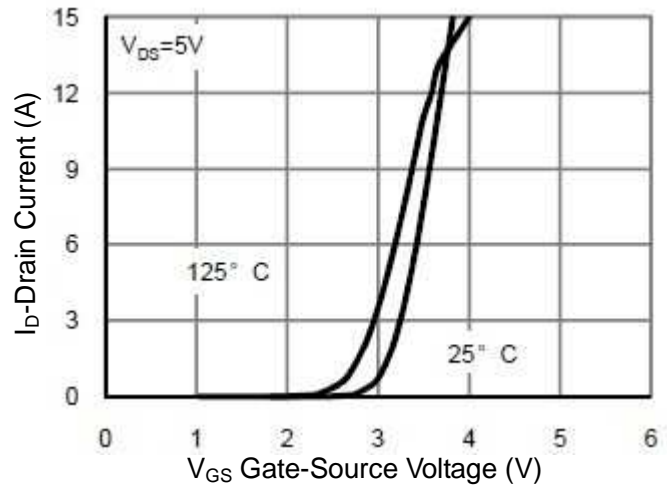


Figure3. ID vs Junction Temperature

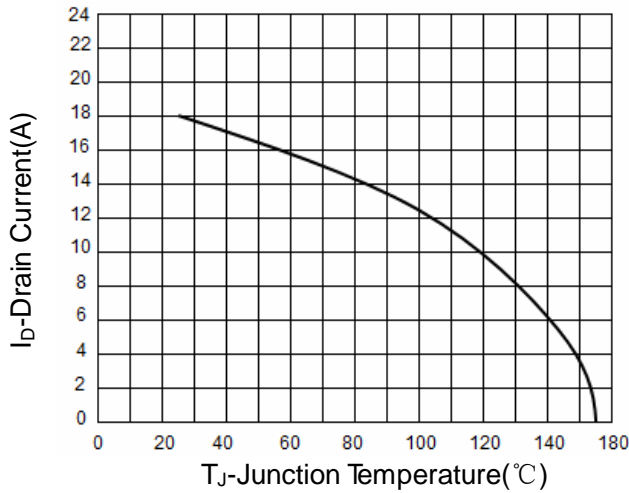


Figure4. On-Resistance vs. Junction Temperature

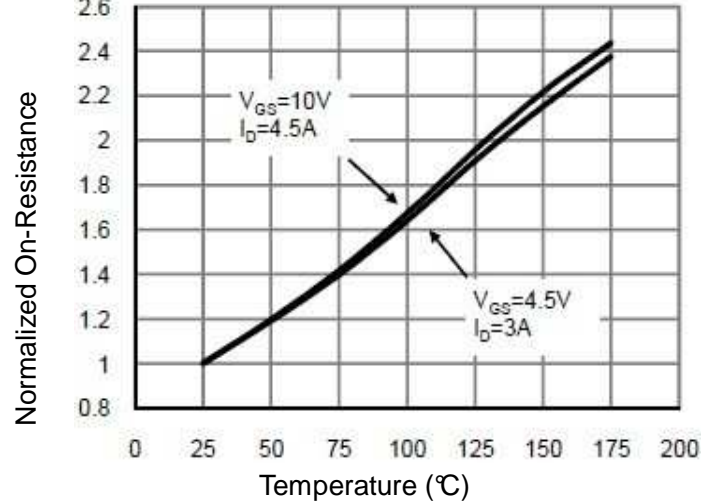


Figure5. On-Resistance vs. Gate-Source Voltage

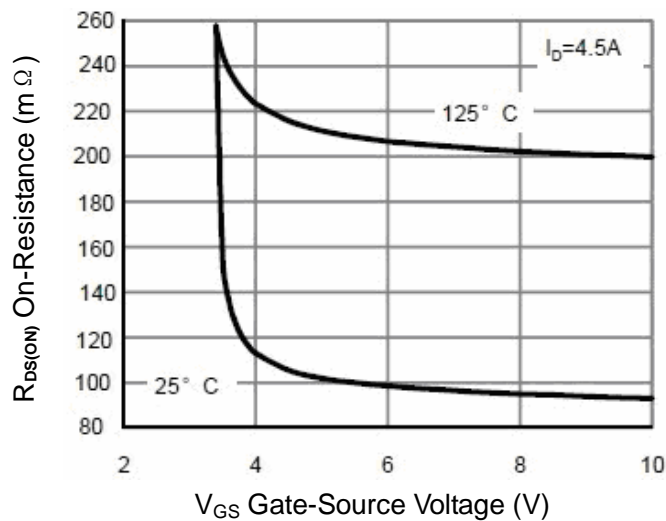
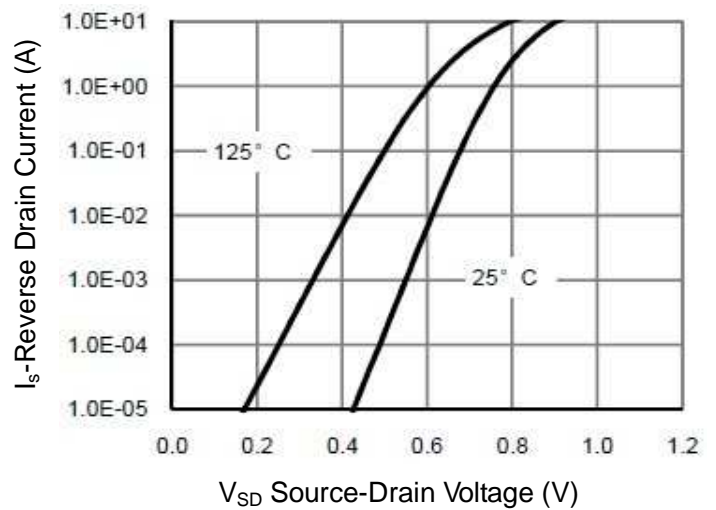


Figure6. Body-Diode Characteristics



Typical Characteristics

Figure 7. Gate-Charge Characteristics

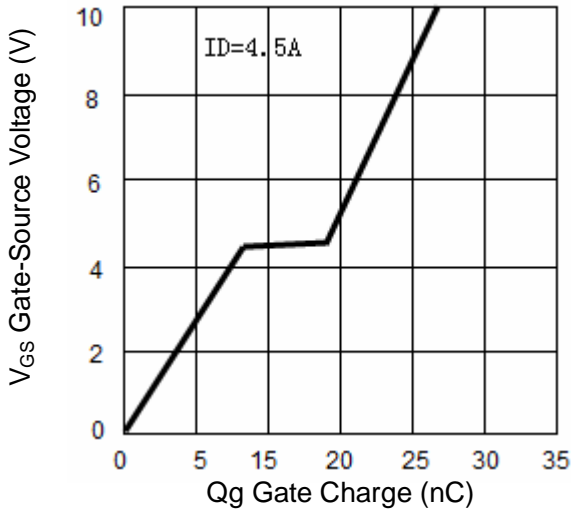


Figure 8. Capacitance Characteristics

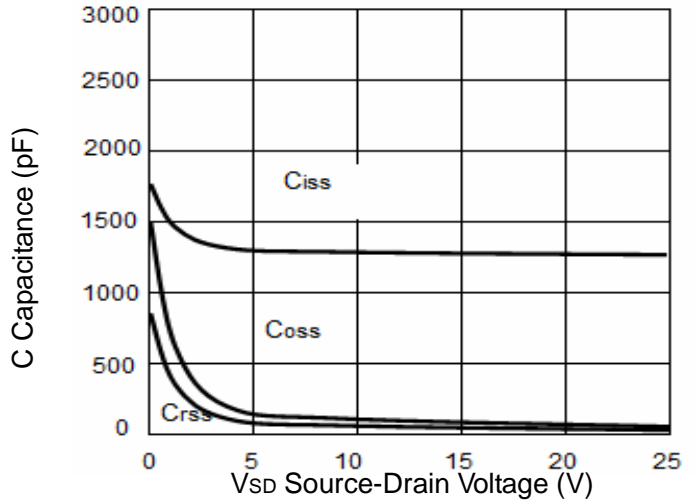


Figure 9. Maximum Forward Biased Safe Operating Area

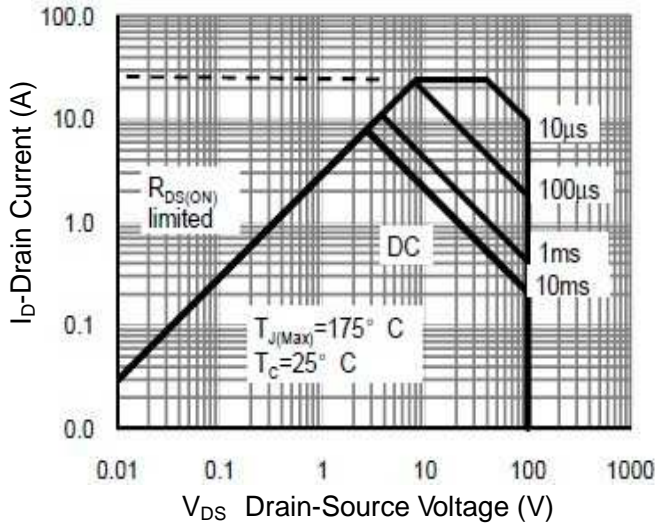


Figure 10. Single Pulse Power Rating Junction-to-Case

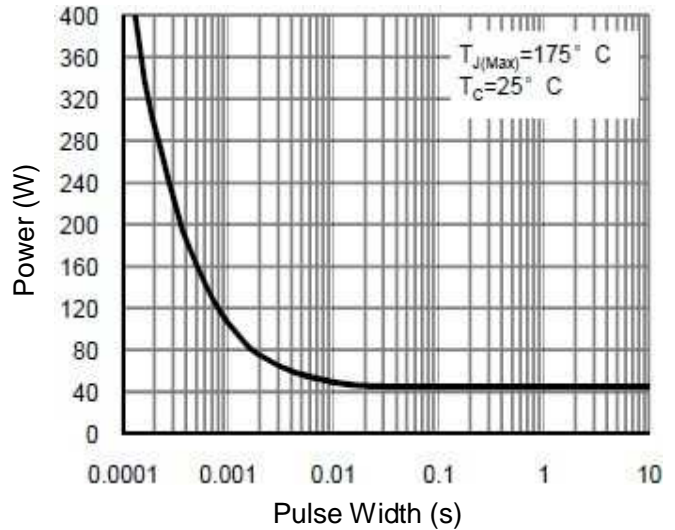
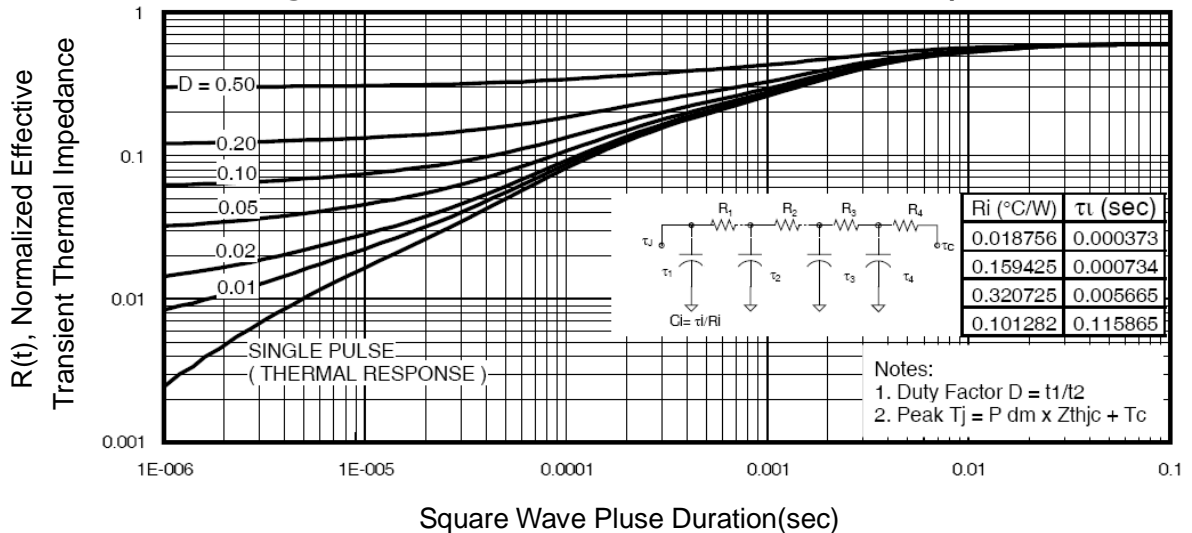


Figure 11. Normalized Maximum Transient Thermal Impedance





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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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