

Features

- Excellent Package for Good Heat Dissipation
- Fast Switching
- Halogen Free. "Green" Device (Note 1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)
- Moisture Sensitivity Level 3

Maximum Ratings

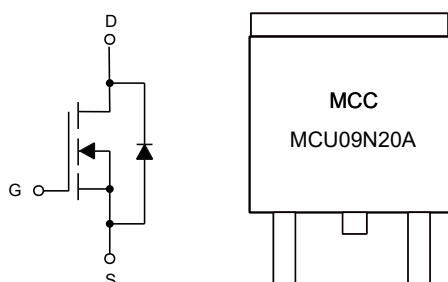
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 46°C/W Junction to Ambient (Steady-State) (Note 2)
- Thermal Resistance: 1.2°C/W Junction to Case (Steady-State)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	200	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	9	A
		5.7	
Pulsed Drain Current (Note 3)	I_{DM}	36	A
Total Power Dissipation (Note 4)	P_D	104.2	W
Single Pulsed Avalanche Energy (Note 5)	E_{AS}	142	mJ

Note:

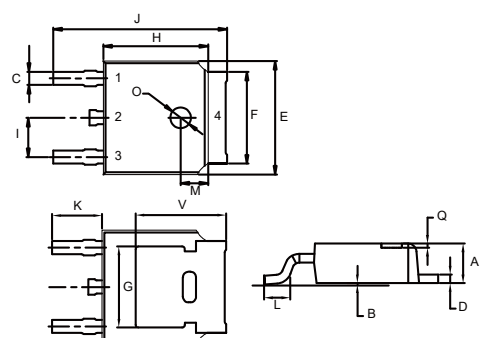
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$. The Power dissipation P_{DSM} is based on $R_{\theta JA} t \leq 10\text{s}$ and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-case thermal resistance.
5. $T_J = 25^\circ\text{C}$, $V_{DD} = 150\text{V}$, $V_{GS} = 10\text{V}$, $L = 10\text{mH}$

Internal Structure and Marking Code



N-CHANNEL MOSFET

DPAK(TO-252)



1. Gate
2,4. Drain
3. Source

DIMENSIONS					
DIM	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
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		TYP.
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		TYP.
L	0.055	0.067	1.40	1.70	
M	0.063		1.60		TYP.
O	0.043	0.051	1.10	1.30	
Q	0.000	0.012	0.00	0.30	
V	0.211		5.35		TYP.

Electrical Characteristics @ 25°C (Unless Otherwise Specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	200			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =200V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.6	2	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =4.5A		227	300	mΩ
Gate Resistance	R _g	F=1 MHz, Open drain		1.9		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				9	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =4.5A			1.4	V
Reverse Recovery Time	t _{rr}	I _F =9A, dI _F /dt=100A/μs		120		ns
Reverse Recovery Charge	Q _{rr}			636		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz		488		pF
Output Capacitance	C _{oss}			96		
Reverse Transfer Capacitance	C _{rss}			52.1		
Total Gate Charge	Q _g	V _{DS} =100V, V _{GS} =10V, I _D =9A		40		nC
Gate-Source Charge	Q _{gs}			1.7		
Gate-Drain Charge	Q _{gd}			16.5		
Turn-On Delay Time	t _{d(on)}	V _{DD} =100V, V _{GS} =10V, R _{GEN} =6Ω, I _{DS} =9A		5		ns
Turn-On Rise Time	t _r			13.5		
Turn-Off Delay Time	t _{d(off)}			51		
Turn-Off Fall Time	t _f			24		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

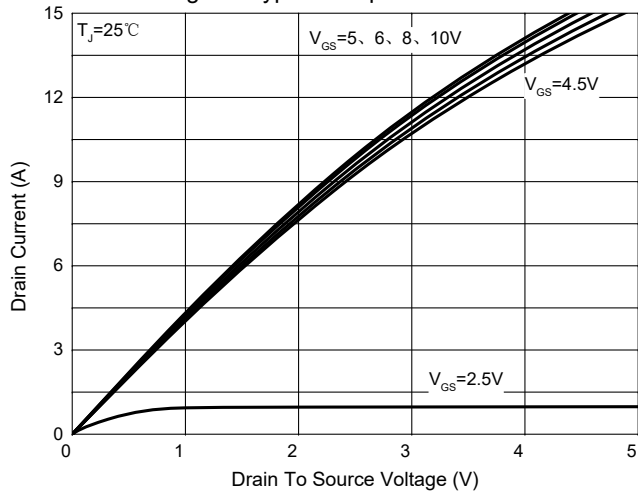


Fig. 2 - Transfer Characteristics

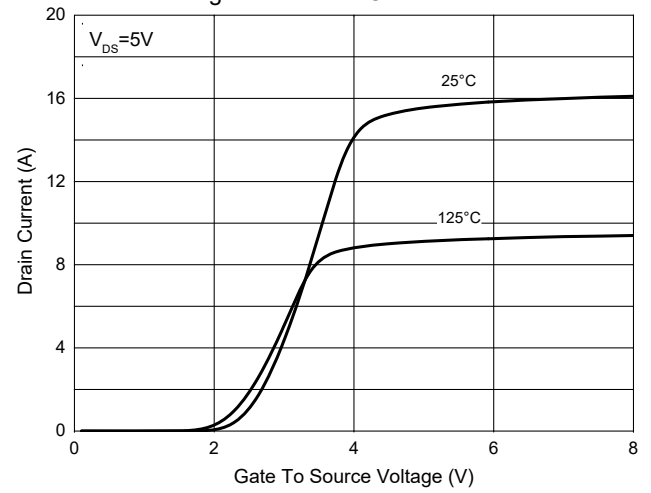


Fig. 3 - $R_{DS(ON)}-I_D$

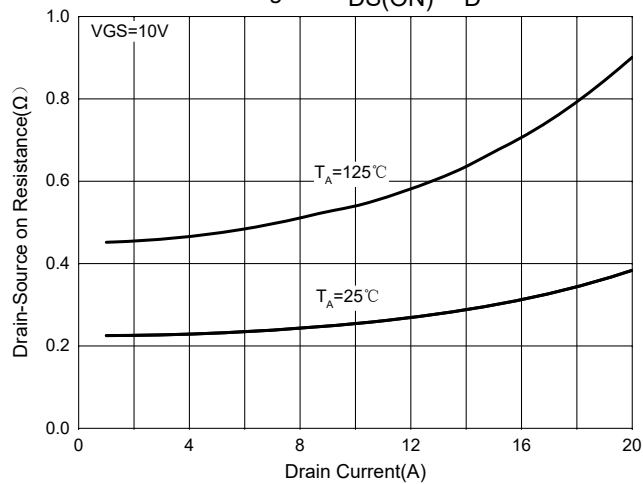


Fig. 4 - $R_{DS(ON)}-V_{GS}$

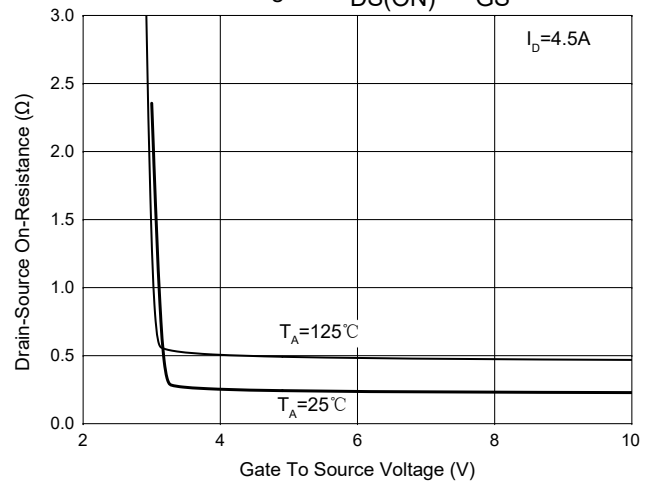


Fig. 5 - Capacitance Characteristics

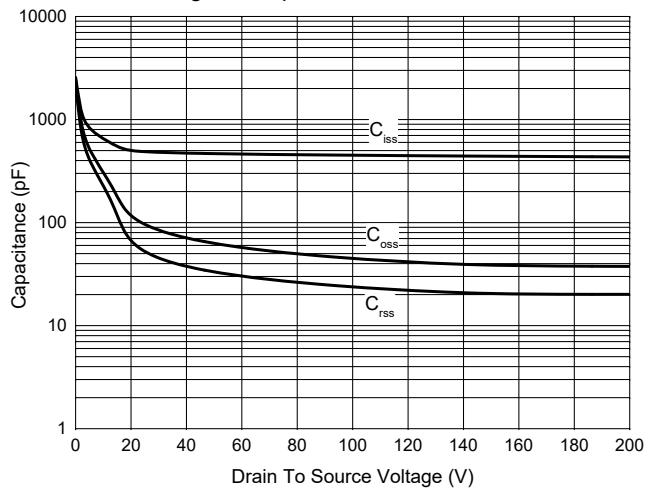
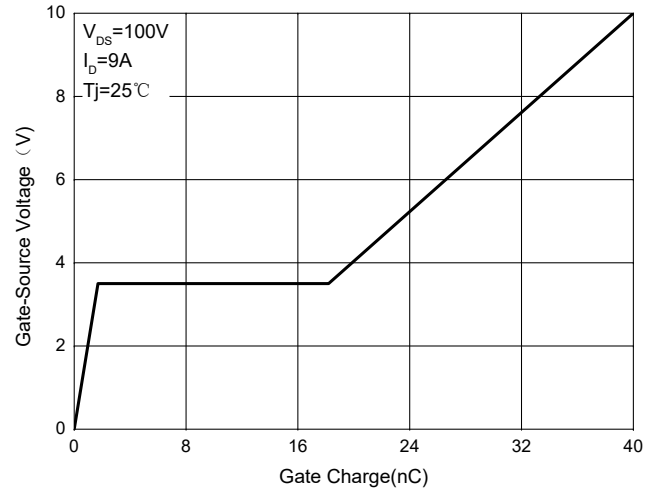


Fig. 6 - GateCharge



Curve Characteristics

Fig. 7 - Normalized Threshold voltage

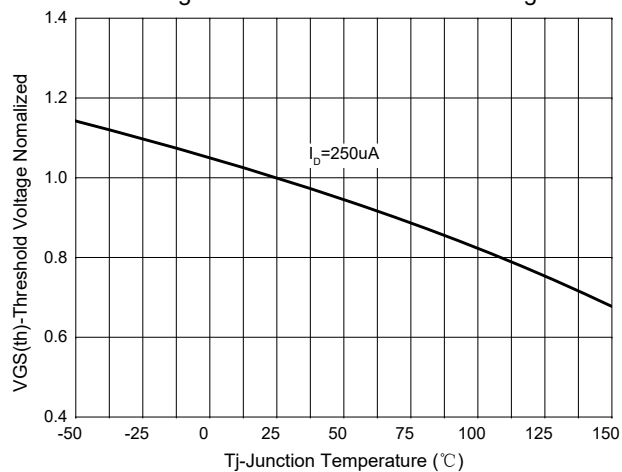


Fig.8-NormalizedOnResistanceCharacteristics

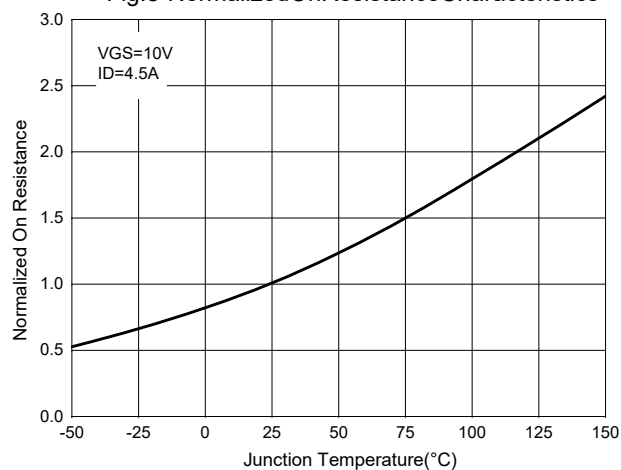


Fig. 9 - $I_S - V_{SD}$

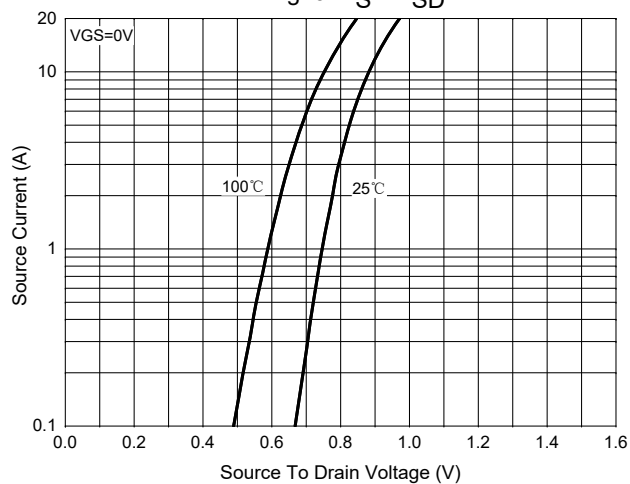


Fig. 10 - Current dissipation

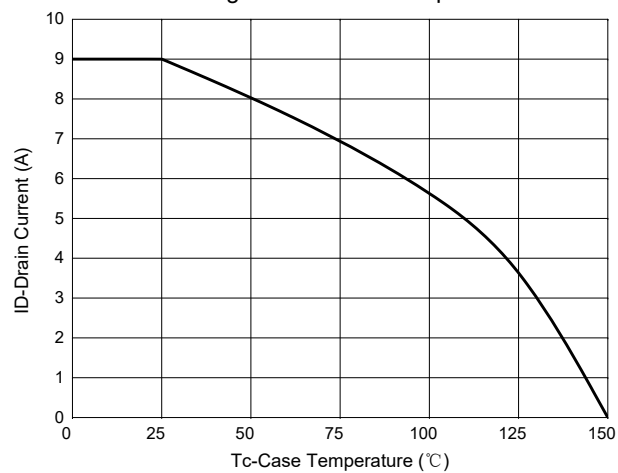
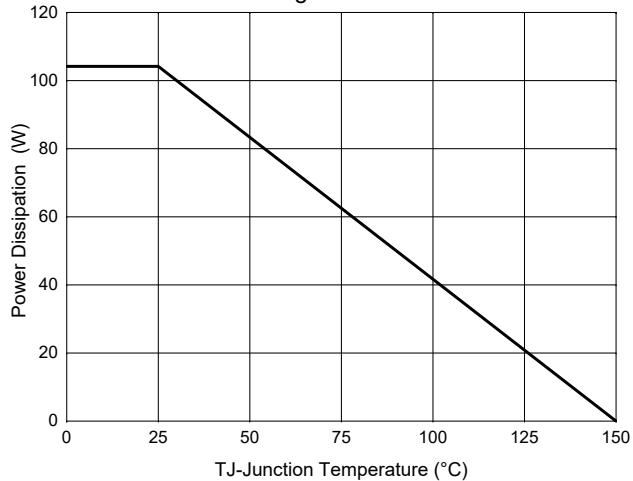


Fig.11-PD-T_J



Curve Characteristics

Fig. 12 - Safe Operation Area

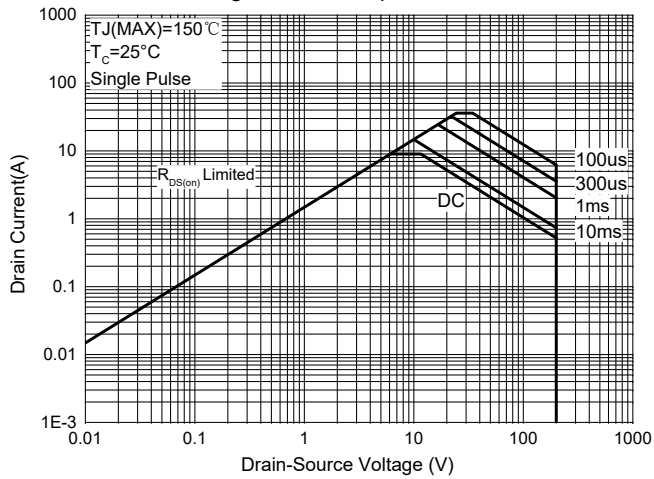
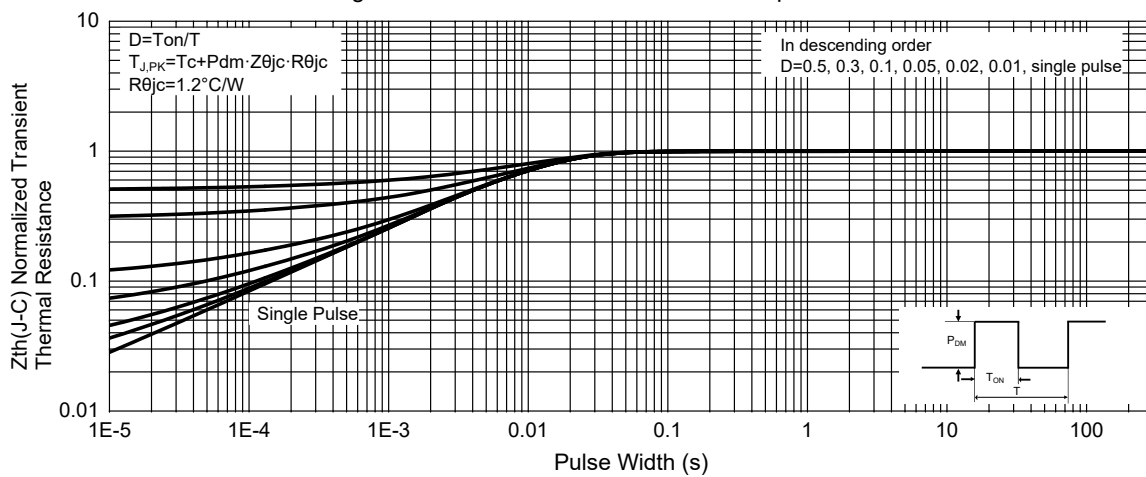


Fig. 13 -Normalized Transient Thermal Impedance



Ordering Information

Device	Packing
MCU09N20A-TP	Tape&Reel: 2.5Kpcs/Reel

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