



**THE DATASHEET OF
MCU45N10HE3-TP**



Features

- AEC-Q101 Qualified
- Split Gate Trench MOSFET Technology
- Low $R_{DS(on)}$ & FOM
- Moisture Sensitivity Level 1
- Halogen Free. "Green" Device^(Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

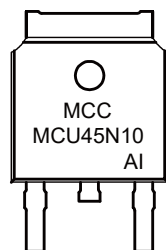
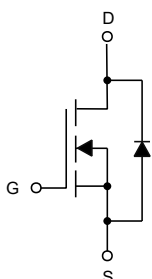
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance: 50°C/W Junction to Ambient ^(Note2)
- Thermal Resistance: 1.7°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	$T_C=25^\circ C$	45
		$T_C=100^\circ C$	28
Pulsed Drain Current ^(Note3)	I_{DM}	180	A
Total Power Dissipation ^(Note4)	P_D	73.5	W
Avalanche Energy ^(Note5)	E_{AS}	81	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 $T_A=25^\circ C$.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. P_D is based on max. junction temperature, using junction-ambient thermal resistance.
5. $T_J=25^\circ C$, $V_{DS}=50V$, $V_{GS}=10V$, $R_g=25\Omega$, $L=0.5mH$.

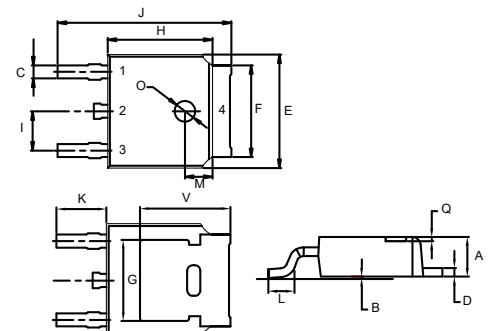
Symbolic Representation of the Part Number



AI: 2 codes in total
A is the year
I is the month

N-CHANNEL MOSFET

DPAK(TO-252)



- 1. Gate
- 2,4. Drain
- 3. Source

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	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	100			V
Gate-Source Leakage Current	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=100V, V_{GS}=0V$			1	μA
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1	1.8	2.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V, I_D=20A$		14	17	m Ω
		$V_{GS}=4.5V, I_D=20A$		18	21.5	
Gate Resistance	R_g	f=1MHz, Open drain		1.4		Ω
Diode Characteristics						
Continuous Body Diode Current	I_S				40	A
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=20A$			1.3	V
Reverse Recovery Time	t_{rr}	$I_F=25A, di_F/dt=100A/\mu s$		45		ns
Reverse Recovery Charge	Q_{rr}			63		nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=50V, V_{GS}=0V, f=1MHz$		1165		pF
Output Capacitance	C_{oss}			265		
Reverse Transfer Capacitance	C_{rss}			8		
Total Gate Charge	Q_g	$V_{DS}=50V, V_{GS}=10V, I_D=25A$		20		nC
Gate-Source Charge	Q_{gs}			4		
Gate-Drain Charge	Q_{gd}			4.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V, V_{DD}=50V, I_D=25A, R_G=2.5\Omega$		9		ns
Turn-On Rise Time	t_r			39		
Turn-Off Delay Time	$t_{d(off)}$			13		
Turn-Off Fall Time	t_f			2.6		

Curve Characteristics

Fig.1 - Typical Output Characteristics

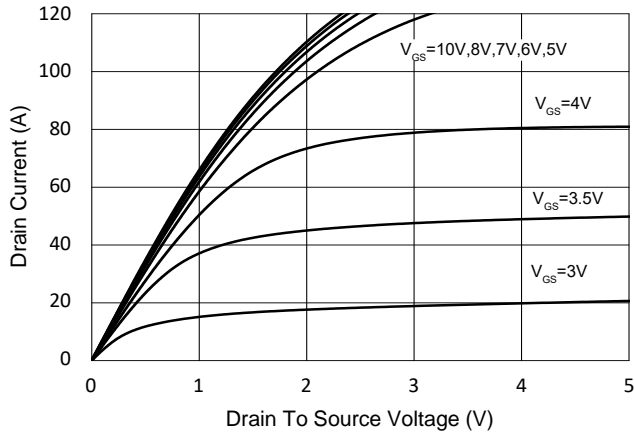


Fig.2 - Transfer Characteristic

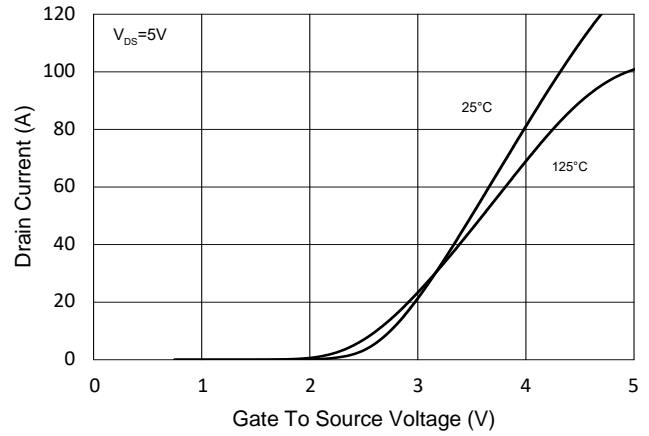


Fig.3 - $R_{DS(ON)}$ - V_{GS}

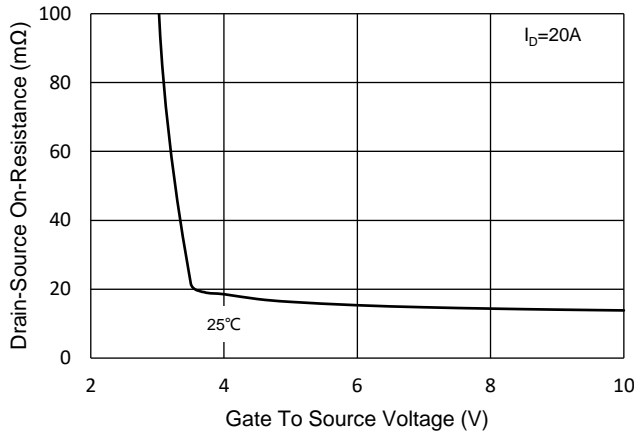


Fig.4 - $R_{DS(ON)}$ - I_D

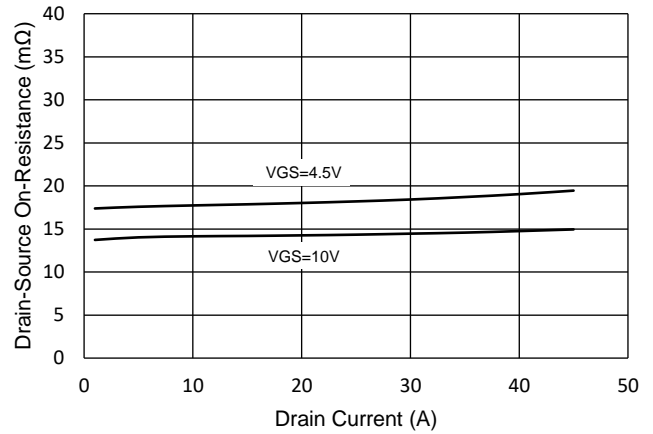


Fig.5 - Capacitance Characteristics

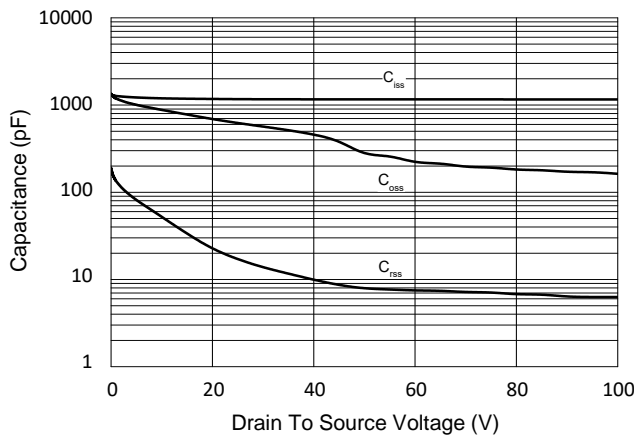
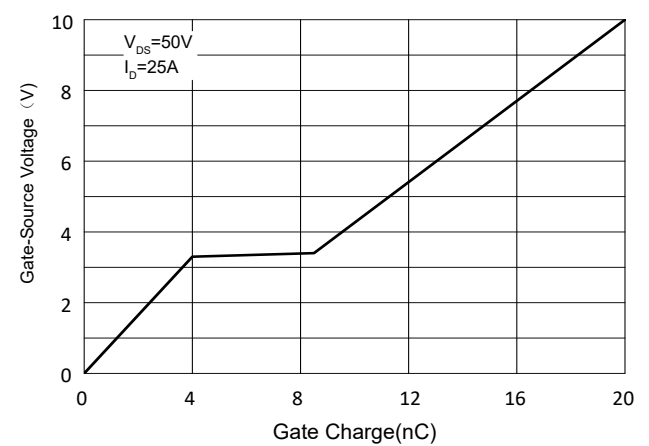


Fig.6 - Gate Charge



Curve Characteristics

Fig.7 - Normalized Threshold Voltage

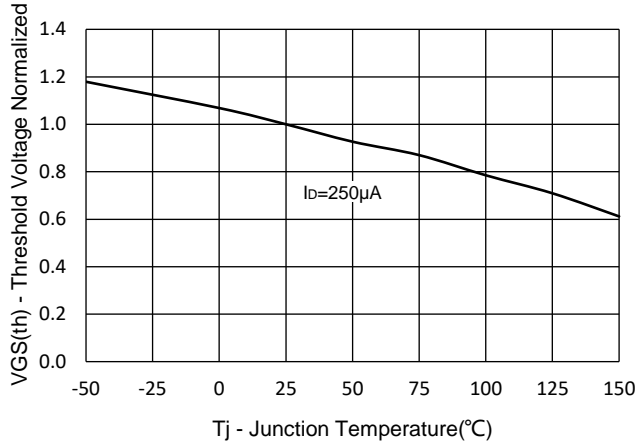


Fig.8 - Normalized On Resistance Characteristics

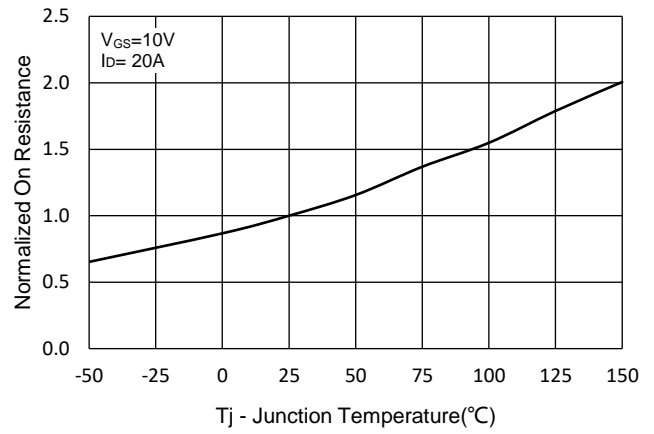


Fig.9 - $I_S - V_{SD}$

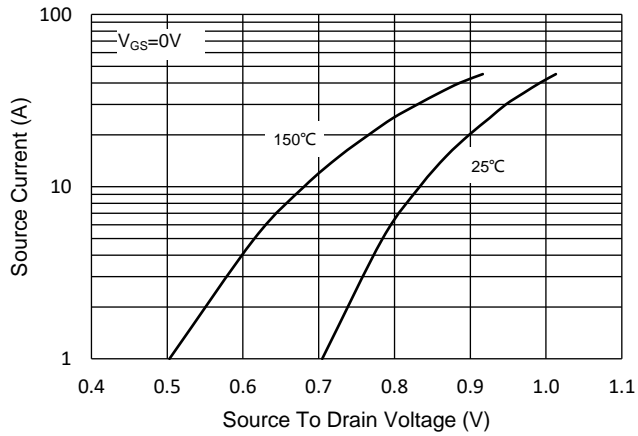


Fig.10 - Drain Current

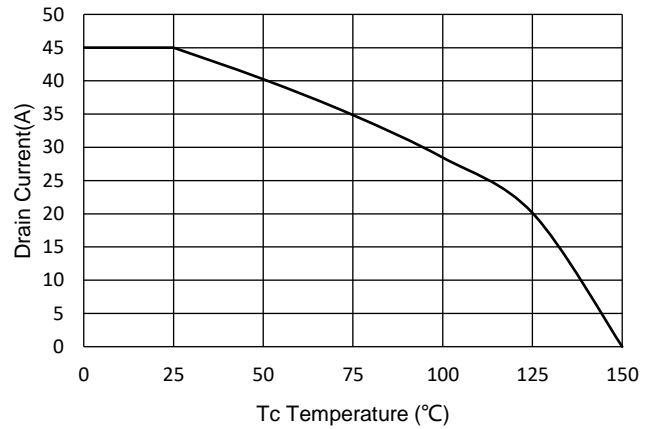
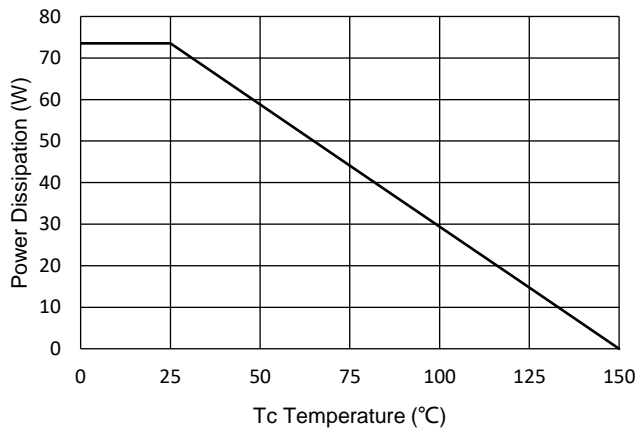


Fig.11 - PD Dissipation



Curve Characteristics

Fig.12 - Safe Operation Area

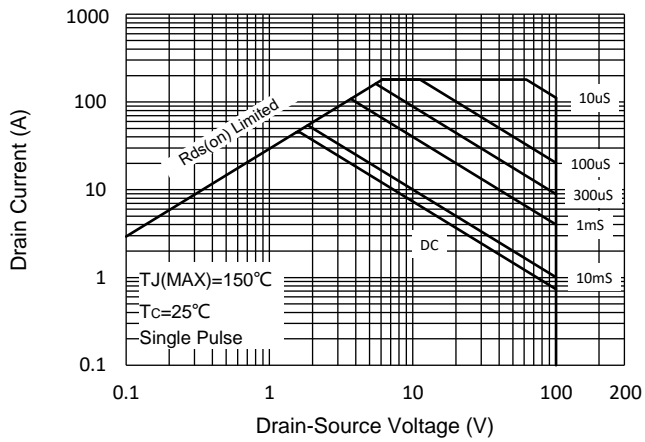
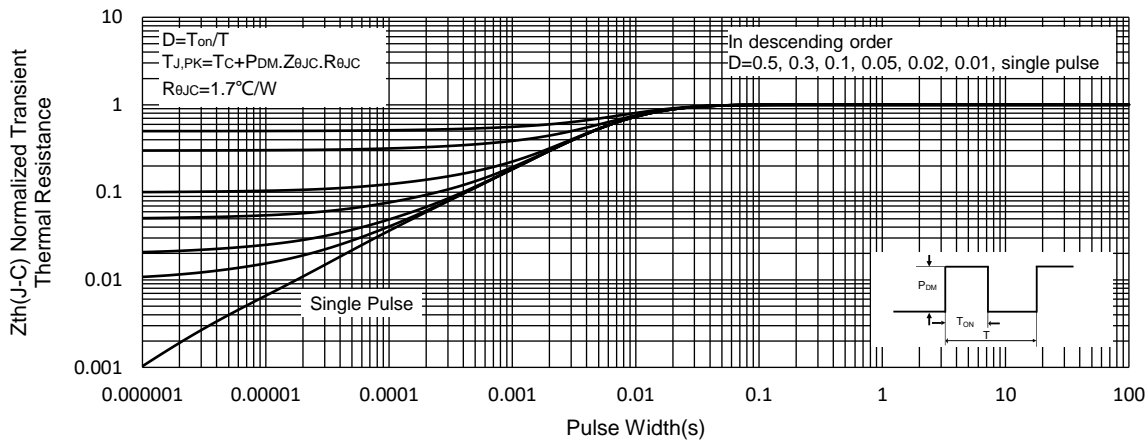


Fig.13 - Normalized Transient Thermal Impedance



Ordering Information

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

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