

Features

- Low On-resistance and Low Conduction Loss
- Super Junction technology for High Voltage Application
- Soft Switching with Fast Reverse Recovery Diode
- Ultra Low Gate Charge Cause Lower Driving Requirement
- Low impedance Kelvin source pin-out
- Moisture Sensitivity Level 1
- Epoxy Meets UL 94 V-0 Flammability Rating
- Halogen Free."Green "Device^(Note 1)
- Lead Free Finish/RoHS Compliant. "P" Suffix Designates RoHS Compliant. See Ordering Information

Maximum Ratings

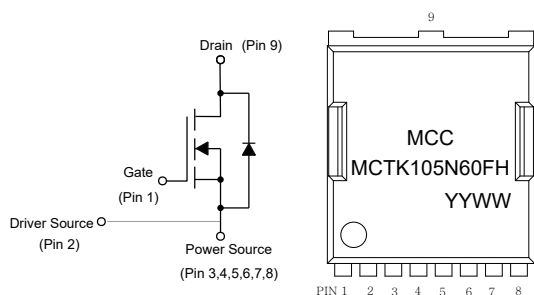
- Operating Junction Temperature Range : -55°C to +150°C
- Storage Temperature Range: -55°C to +150°C
- Thermal Resistance Junction to Ambient,Max^(Note 2): 60°C/W
- Thermal Resistance Junction to Case,Max : 1.17°C/W

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	600	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current	I_D	$T_C=25^\circ\text{C}$ 17.5	A
		$T_C=100^\circ\text{C}$ 11	
Pulsed Drain Current ^(Note 3)	I_{DM}	70	A
Total Power Dissipation, $T_C=25^\circ\text{C}$	P_D	107	W
Single Avalanche Energy ^(Note 4)	E_{AS}	365	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. Device mounted on 1 in² FR-4 board with 2oz. single-sided Copper, in a still air environment with $T_A=25^\circ\text{C}$.
3. Repetitive rating; pulse width limited by max. junction temperature.
4. Starting $T_J=25^\circ\text{C}$, $V_{DD}=50\text{V}$, $V_{GS}=10\text{V}$, $I_{AS}=7.8\text{A}$.

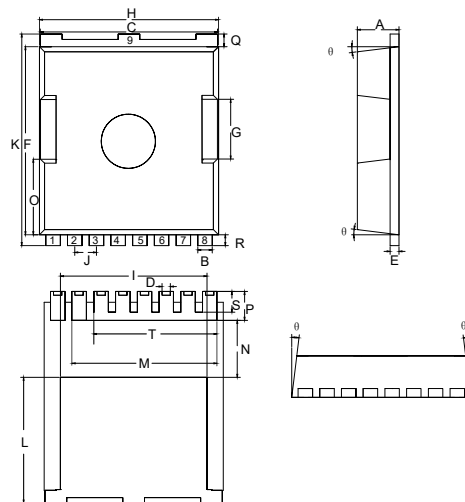
Internal Structure and Marking Code



Device Code: MCTK105N60FH
Date Code: YYWW (Year & Week)

N-CHANNEL Super-Junction Power MOSFET

TOLL-8L-KS



DIMENSIONS

DIM	INCHES		mm		NOTE
	MIN	MAX	MIN	MAX	
A	0.087	0.094	2.20	2.40	
B	0.028	0.035	0.70	0.90	
C	0.382	0.390	9.70	9.90	
D	0.017	0.020	0.42	0.50	
E	0.016	0.024	0.40	0.60	
F	0.405	0.417	10.28	10.58	
G	0.122	0.138	3.10	3.50	
H	0.382	0.398	9.70	10.10	
I	0.311	0.327	7.90	8.30	
J	0.047		1.20		BSC
K	0.452	0.468	11.48	11.88	
L	0.266	0.281	6.75	7.15	
M	0.315		8.00		
N	0.118	0.130	3.00	3.30	
O	0.157	0.172	3.98	4.38	
P	0.055	0.071	1.40	1.80	
Q	0.024	0.031	0.60	0.80	
R	0.020	0.028	0.50	0.70	
S	0.039	0.051	1.00	1.30	
θ	4°	10°	4°	10°	
T	0.268		6.80		BSC

Electrical Characteristics ($T_J = 25^\circ\text{C}$ 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 =1mA	600			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±30V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =600V, V _{GS} =0V			10	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =2.1mA	3	4.2	5	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =15.3A		95	105	mΩ
Gate Resistance	R _g	f=1MHz, open drain		1.3		Ω
Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =15.3A		0.9	1.2	V
Reverse Recovery Time	t _{rr}	V _R =400V, I _F =15.3A di _F /dt=100A/μs		105		ns
Reverse Recovery Charge	Q _{rr}			595		nC
Peak Reverse Recovery Current	I _{rrm}			10		A
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =100V, V _{GS} =0V, f=1MHz		2240		pF
Output Capacitance	C _{oss}			99		
Output capacitance - energy related	C _{o(er)}	V _{DS} =0 to 400V, V _{GS} =0V		93		
Output capacitance - time related	C _{o(tr)}			598		
Total Gate Charge	Q _g	V _{DS} =400V, V _{GS} =10V, I _D =15.3A		57		nC
Gate-Source Charge	Q _{gs}			15		
Gate-Drain Charge	Q _{gd}			28		
Turn-On Delay Time	t _{d(on)}	V _{DD} =400V, V _{GS} =10V R _G =10Ω, I _D =15.3A		100		ns
Turn-On Rise Time	t _r			35		
Turn-Off Delay Time	t _{d(off)}			65		
Turn-Off Fall Time	t _f			22		

Typical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Fig. 1 - Typical Output Characteristics($T_J=25^\circ\text{C}$)

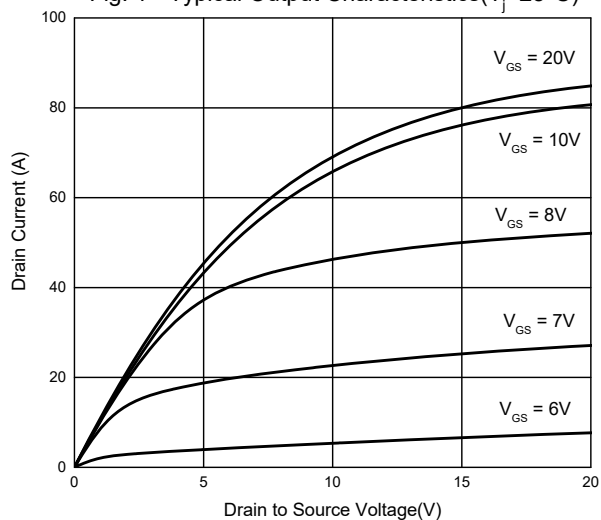


Fig. 2 - Typical Transfer Characteristics

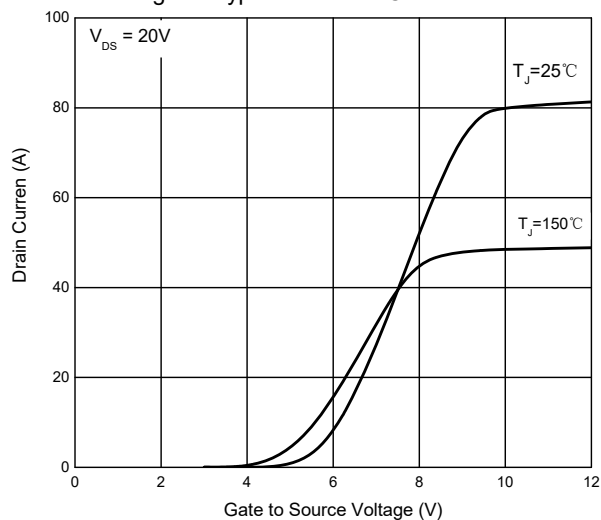


Fig. 3 - On-Resistance vs Gate Bias

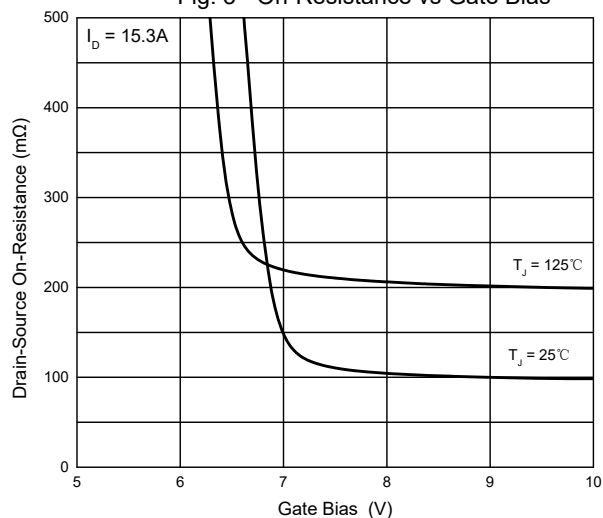


Fig. 4 - On-Resistance vs Drain Current

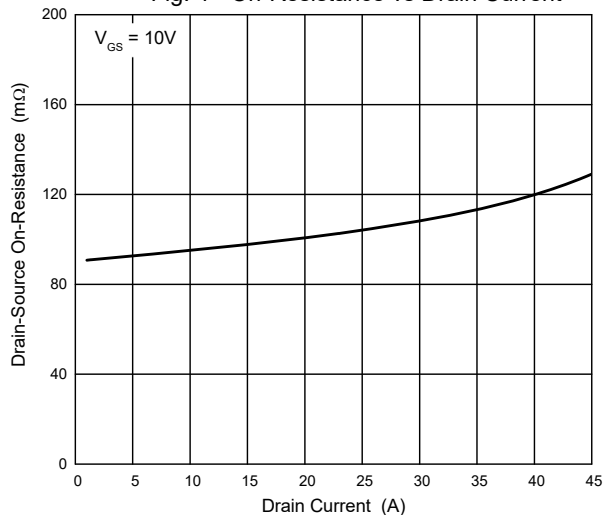


Fig. 5 - Capacitance Characteristic

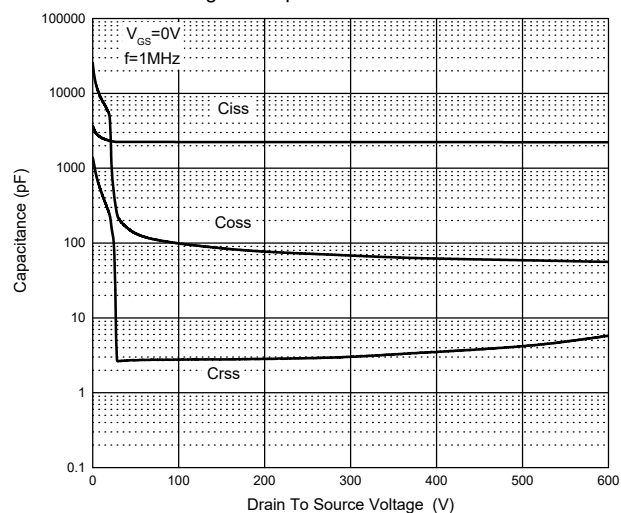
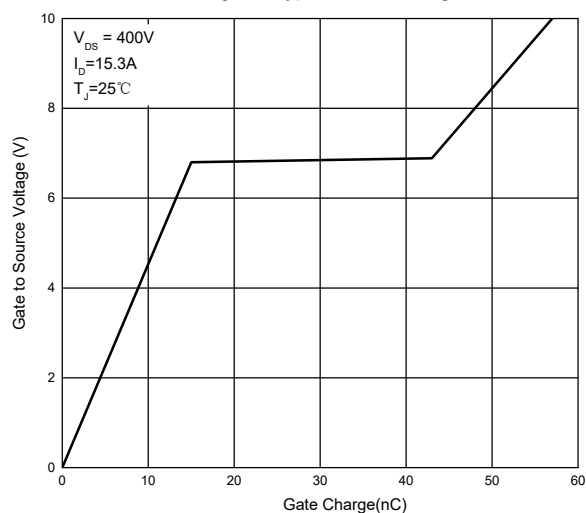


Fig. 6 - Typical Gate Charge



Typical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Fig. 7 - Gate-Threshold Voltage vs Junction Temperature

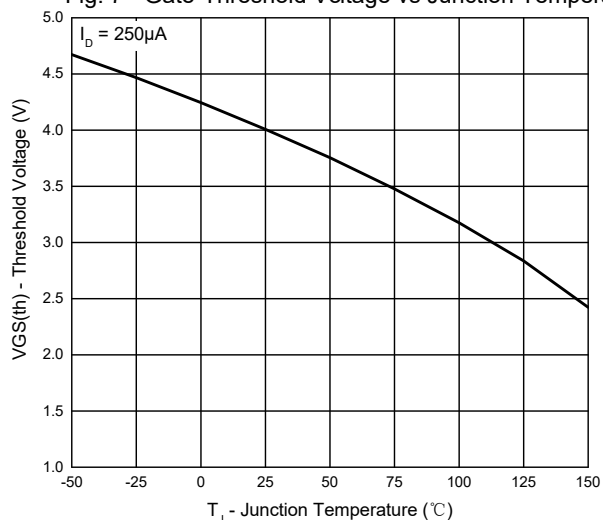


Fig. 8 - Normalized On-Resistance

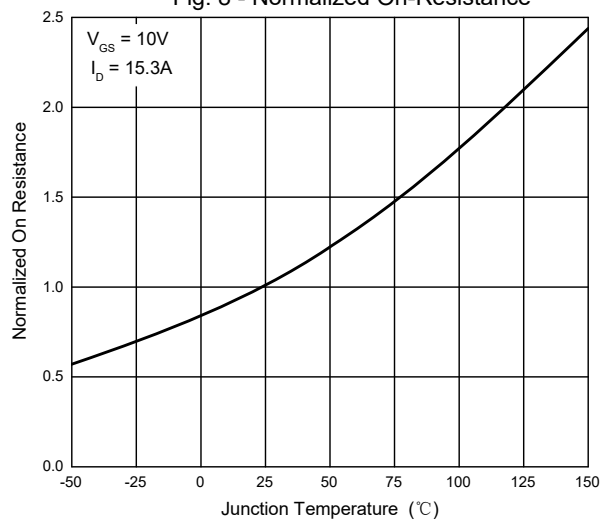


Fig. 9 - Forward Characteristics

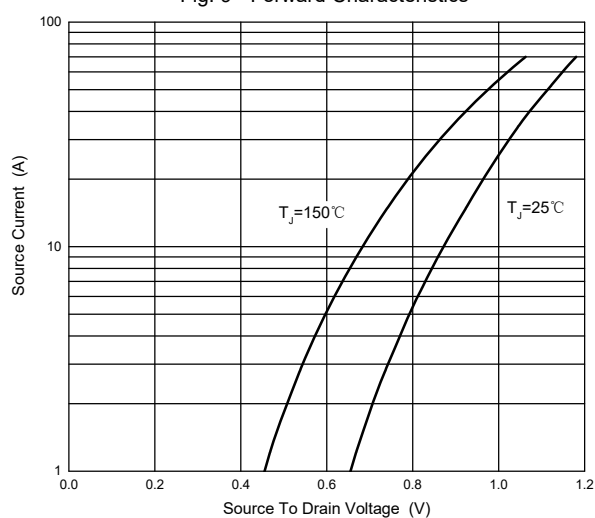


Fig. 10 - Drain Current

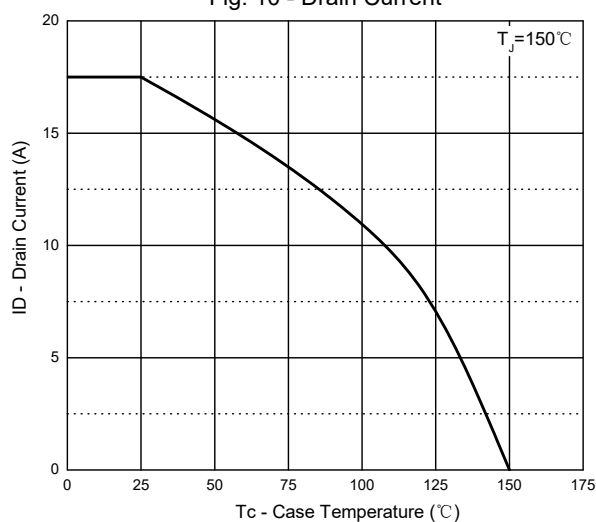


Fig. 11 - Power Dissipation

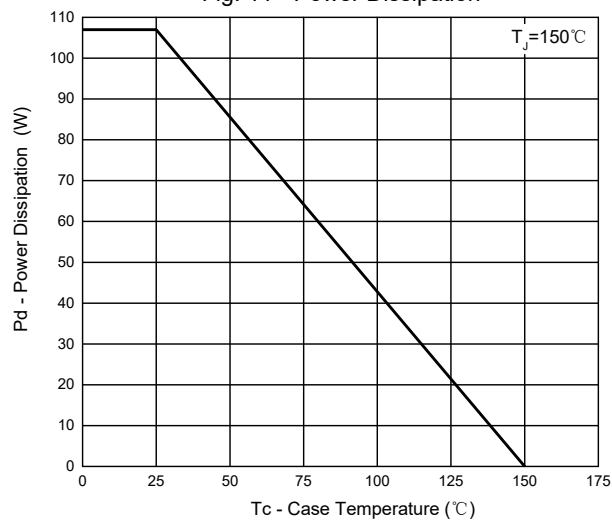
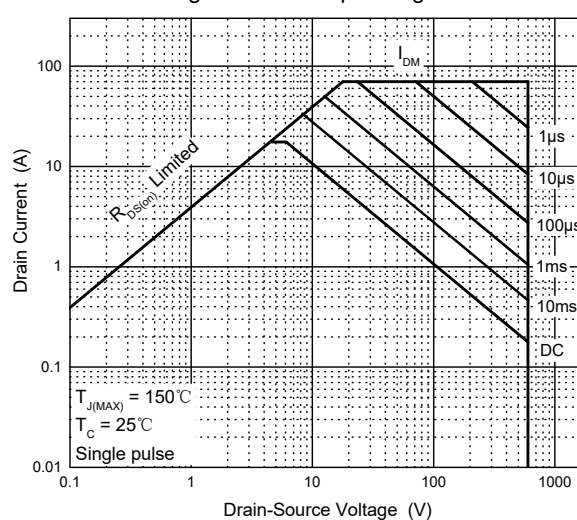
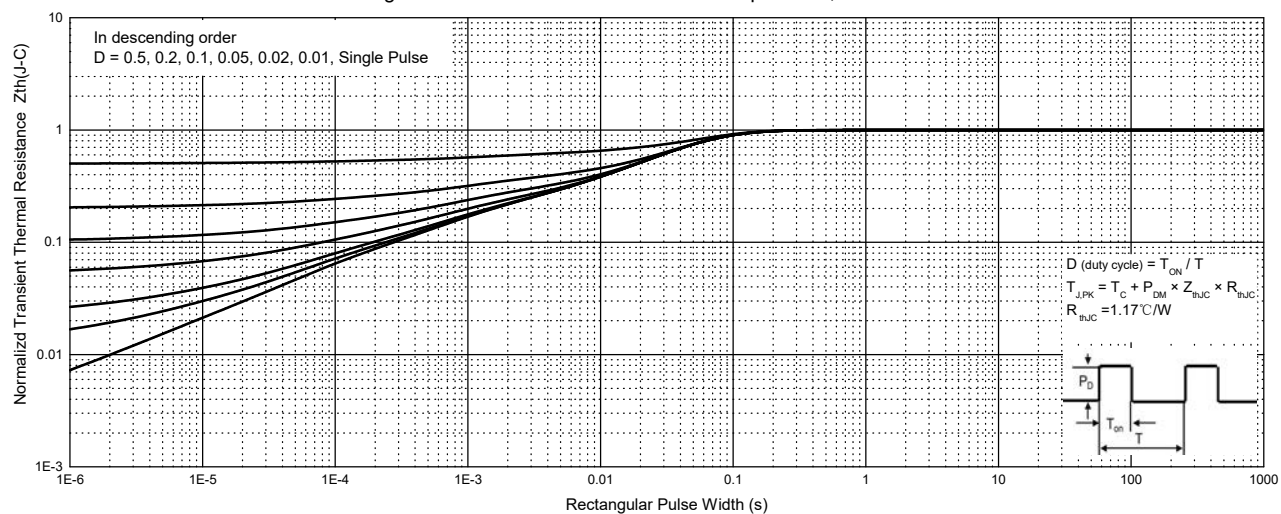


Fig. 12 - Safe Operating Area



Typical Characteristics ($T_J=25^\circ\text{C}$ unless otherwise specified)

Fig.13 - Normalized Transient Thermal Impedance, Junction-Case



Ordering Information

Device	Packing
Part Number-TP	Tape&Reel: 2Kpcs/Reel

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