

Features

- Split Gate Trench MOSFET Technology
- Excellent Package for Heat Dissipation
- Moisture Sensitivity Level 1
- Halogen Free."Green" Device^(Note1)
- Epoxy Meets UL 94 V-0 Flammability Rating
- Lead Free Finish/RoHS Compliant^(Note2) ("P" Suffix Designates RoHS Compliant. See Ordering Information)

Maximum Ratings

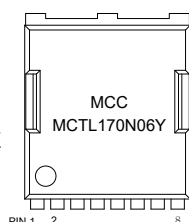
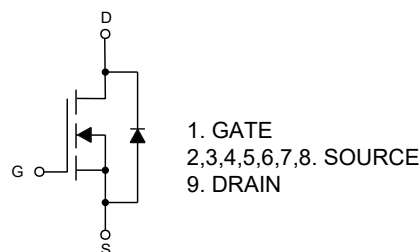
- Operating Junction Temperature Range : -55°C to +175°C
- Storage Temperature Range: -55°C to +175°C
- Thermal Resistance: 40°C/W Junction to Ambient^(Note3)
- Thermal Resistance: 0.82°C/W Junction to Case

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D	170	A
		120	
Pulsed Drain Current ^(Note4)	I_{DM}	680	A
Total Power Dissipation ^(Note5)	P_D	182	W
Single Pulsed Avalanche Energy ^(Note6)	E_{AS}	380	mJ

Note:

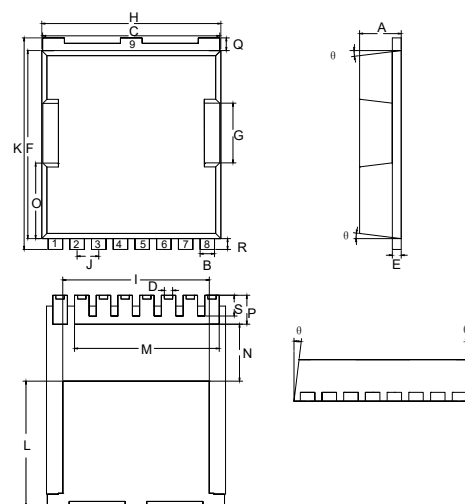
1. Halogen free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
2. High Temperature Solder Exemption Applied, see EU Directive Annex 7(a)-I.
3. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$.
4. Repetitive rating; pulse width limited by max. junction temperature.
5. P_D is based on max. junction temperature, using junction-case thermal resistance.
6. $T_J = 25^\circ\text{C}$, $V_{DD} = 30\text{V}$, $V_{GS} = 10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$.

Internal Structure and Marking Code



N-CHANNEL MOSFET

TOLL-8L



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°	

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 =1mA	60			V
Gate-Source Leakage Current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =48V, V _{GS} =0V			1	μA
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.0	2.7	4.0	V
Drain-Source On-Resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A		1.9	2.4	mΩ
		V _{GS} =6V, I _D =20A		2.8	4.0	
Gate Resistance	R _g	f=1 MHz, Open Drain		2.0		Ω
Diode Characteristics						
Continuous Body Diode Current	I _S				170	A
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =50A			1.2	V
Reverse Recovery Time	t _{rr}	I _F =50A, dI _F /dt=100A/μs		38		ns
Reverse Recovery Charge	Q _{rr}			37		nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =30V, V _{GS} =0V, f=1MHz		3667		pF
Output Capacitance	C _{oss}			1757		
Reverse Transfer Capacitance	C _{rss}			136		
Total Gate Charge	Q _g	V _{DS} =30V, V _{GS} =10V, I _D =50A		65.6		nC
Gate-Source Charge	Q _{gs}			16.3		
Gate-Drain Charge	Q _{gd}			21.9		
Turn-On Delay Time	t _{d(on)}	V _{DD} =30V, V _{GS} =10V, I _{DS} =50A, R _G =3Ω		18		ns
Turn-On Rise Time	t _r			52		
Turn-Off Delay Time	t _{d(off)}			41		
Turn-Off Fall Time	t _f			32		

Curve Characteristics

Fig. 1 - Typical Output Characteristics

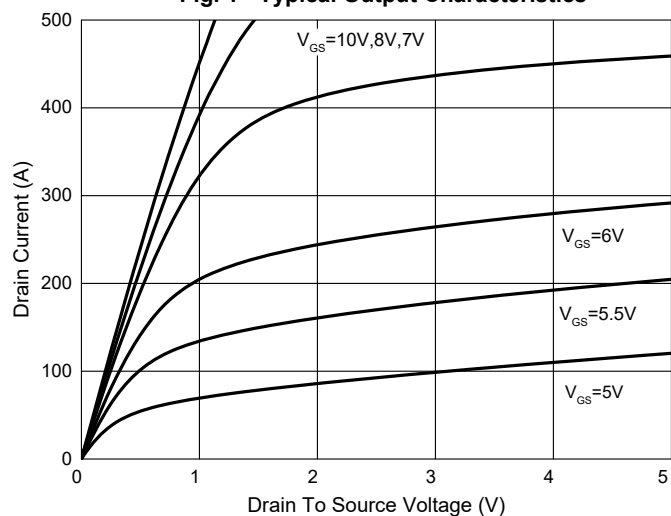


Fig. 2 - Transfer Characteristics

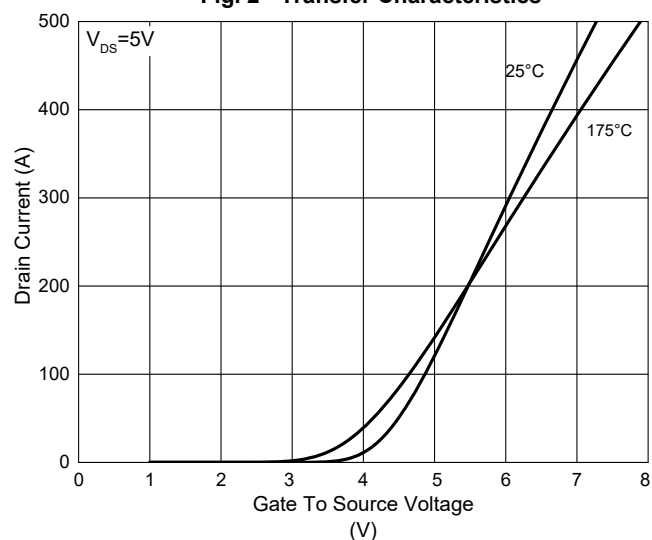


Fig. 3 - $R_{DS(ON)}$ — V_{GS}

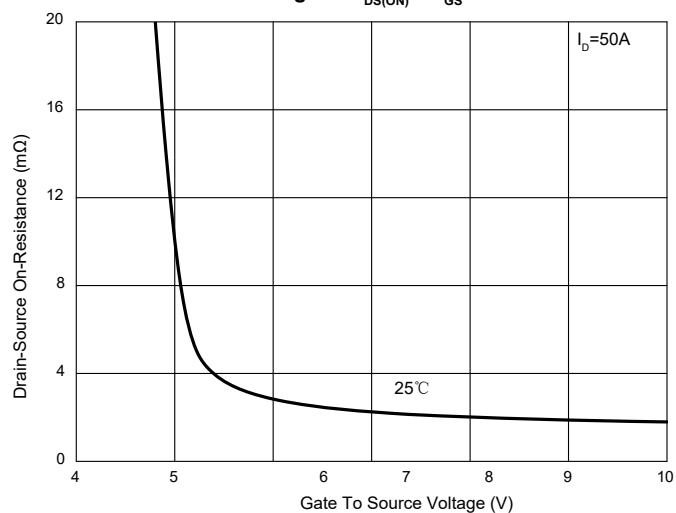


Fig. 4 - $R_{DS(ON)}$ — I_D

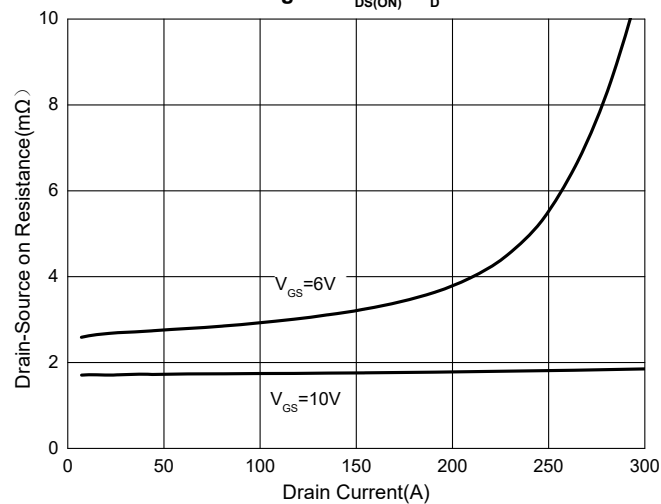


Fig. 5 - Capacitance Characteristics

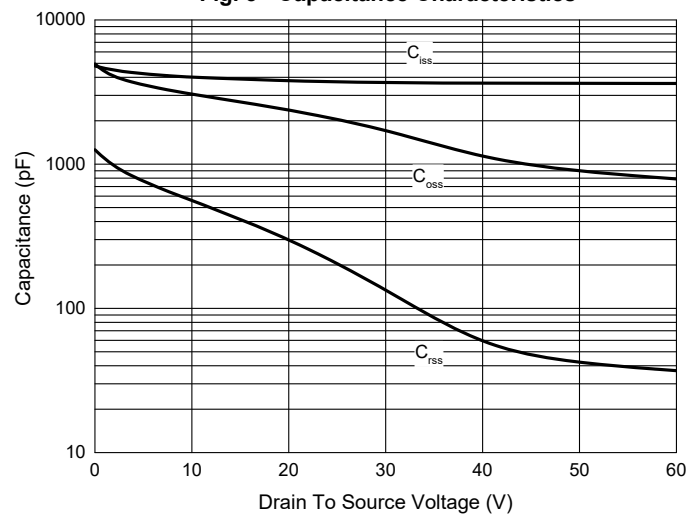
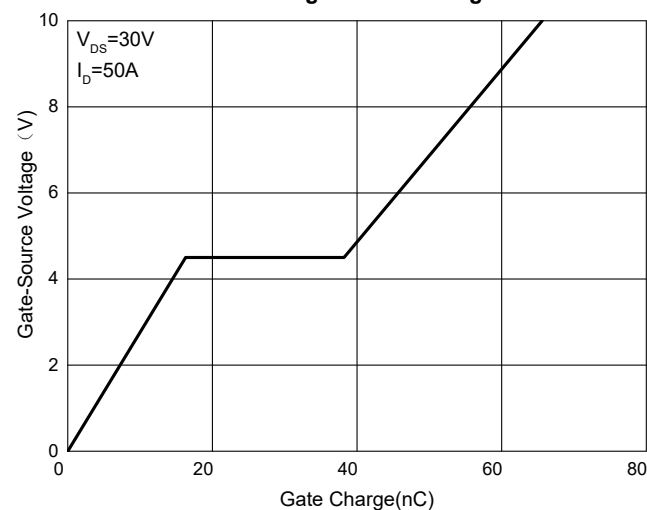


Fig. 6 - Gate Charge



Curve Characteristics

Fig. 7 - Normalized Threshold Voltage

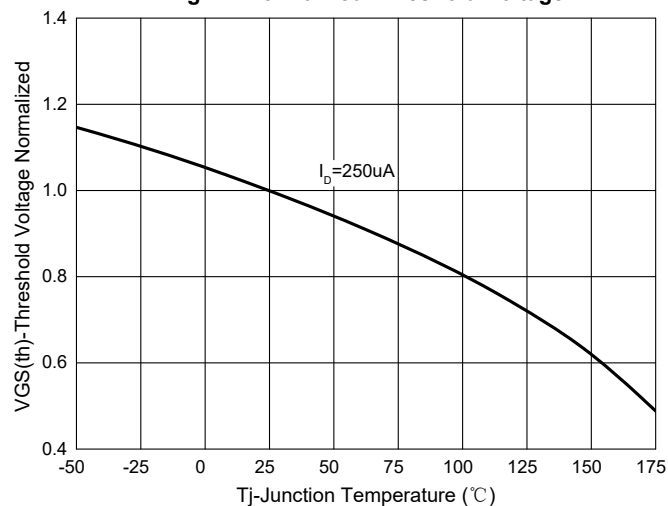


Fig.8-Normalized On Resistance Characteristics

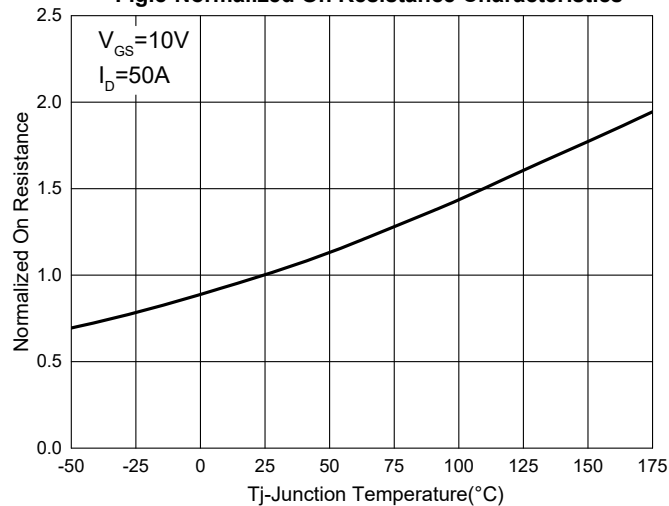


Fig.9 - $I_S - V_{SD}$

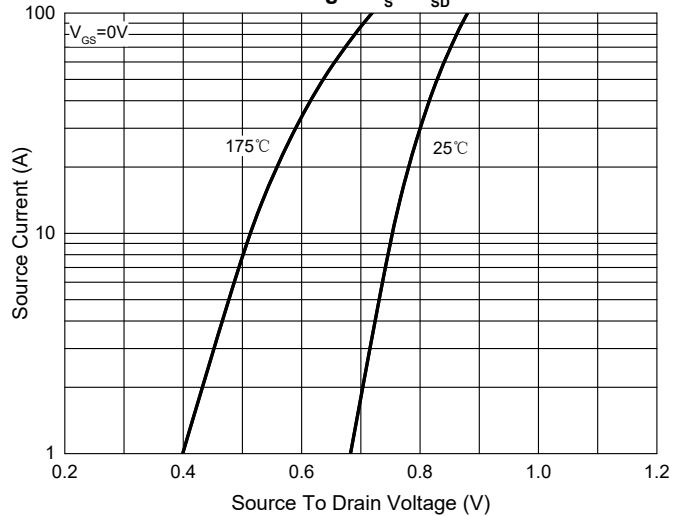


Fig. 10 - Drain Current

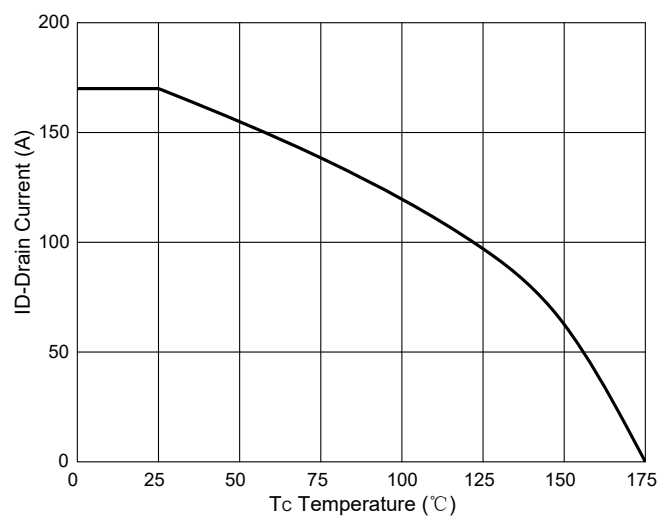
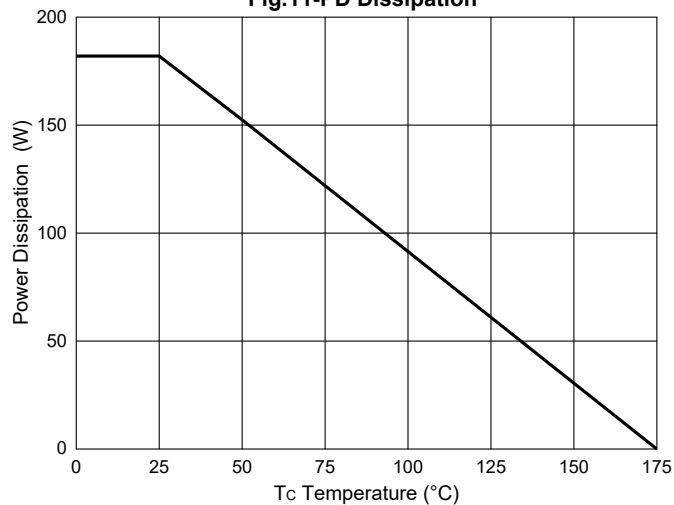


Fig.11-PD Dissipation



Curve Characteristics

Fig. 12 - Safe Operation Area

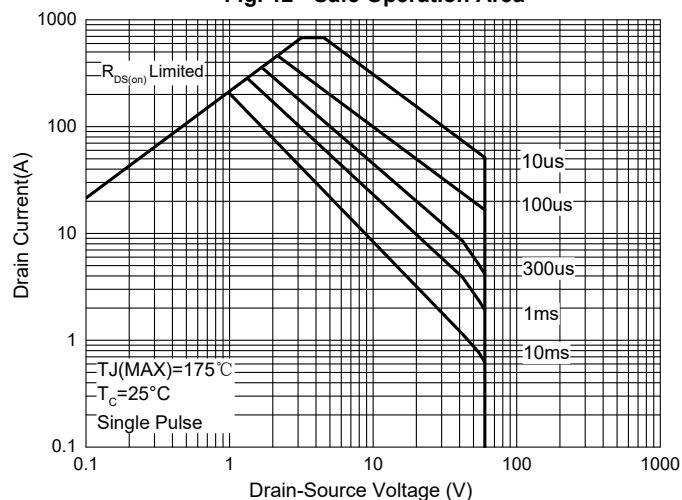
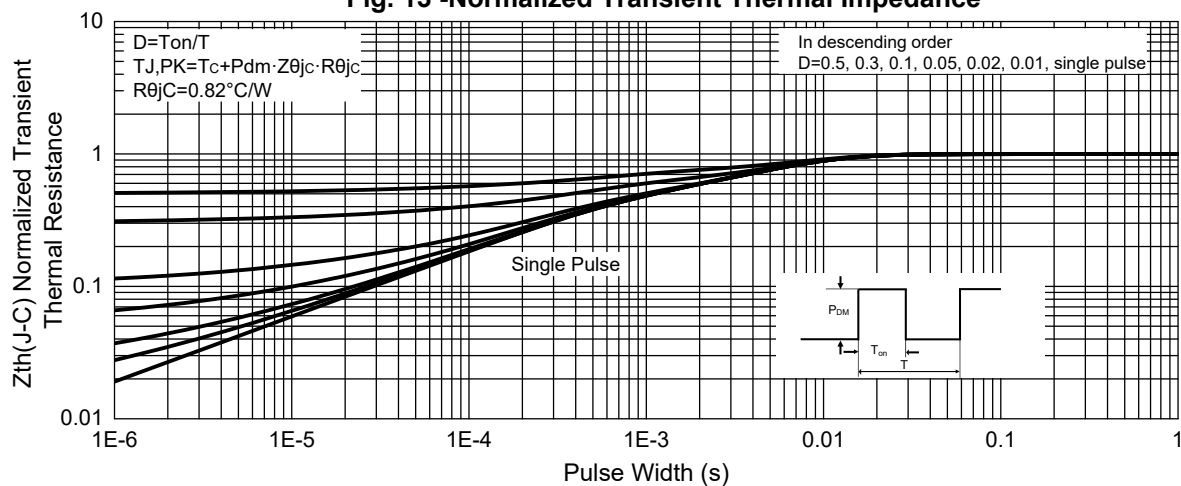


Fig. 13 - Normalized Transient Thermal Impedance



Ordering Information

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

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