

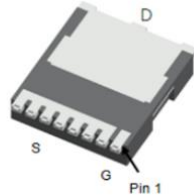
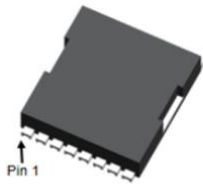
1.Features

- ◆ Excellent $R_{DS(ON)}$ and Low Gate Charge
- ◆ 100% UIS Tested
- ◆ 100% ΔV_{DS} Tested
- ◆ Halogen-free; RoHS-compliant

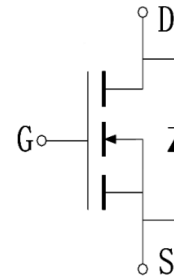
V_{DS}	$R_{DS(on)}$ Typ.	I_D Max.
100V	1.0m Ω @10V	467A

2.Applications

- ◆ Load Switch
- ◆ PWM Application
- ◆ Power Management



TOLL
Pin Description



Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Package	Marking	PCS/Reel	PCS/CTN.
TF012N10LL	TOLL	TF012N10TG	1,500	12,000

4.Absolute Max Ratings at Ta=25°C (Note1)

Parameter		Symbol	Maximum	Units
Drain to Source Voltage		V_{DSS}	100	V
Gate to Source Voltage		V_{GSS}	± 20	V
Drain Current (DC)	T C = 25°C	I_D	467	A
	T C = 100°C	I_D	295	A
Drain Current (Pulse), $PW \leq 300\mu s$		I_{DM}	1868	A
Avalanche Energy, Single Pulsed		E_{AS}	1987	mJ
Total Dissipation	T C = 25°C	P_D	500	W
	T C = 100°C	P_D	200	W
Junction Temperature		T_j	150	°C
Storage Temperature		T_{stg}	-55 to +150	°C

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

5. Thermal Resistance Ratings (Note 2)

Parameter	Symbol	Value	Unit
Junction to Ambient	$R_{\theta JA}$	33	$^{\circ}\text{C/W}$
Junction to case	$R_{\theta JC}$	0.35	$^{\circ}\text{C/W}$

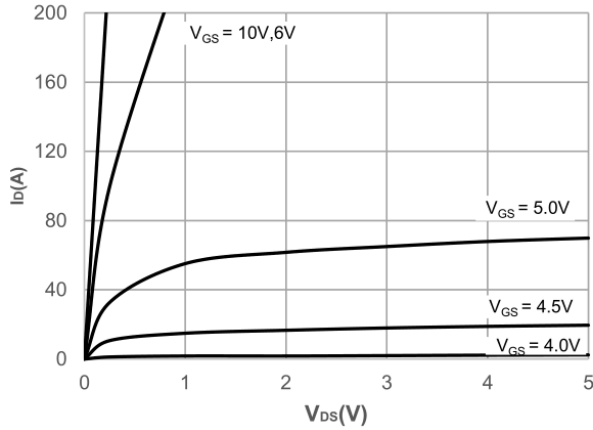
Note 2: When mounted on 1 inch square copper board $t \leq 10\text{sec}$ The value in any given application depends on the user's specific board design.

6. Electrical Characteristics at $T_a=25^{\circ}\text{C}$ (Note 2)

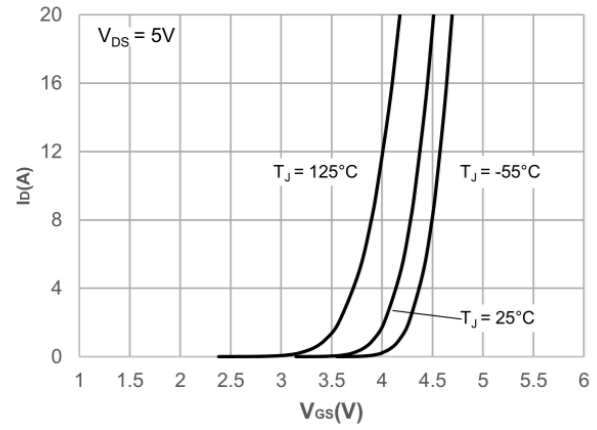
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	100	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{V}$, $V_{GS} = 0\text{V}$	-	-	1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=250\mu\text{A}$	2.0	2.9	4.0	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 20\text{A}$, $V_{GS} = 10\text{V}$	-	1.0	1.3	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=50\text{V}$, Frequency=1.0MHz	9543	13360	18036	pF
Output Capacitance	C_{oss}		3652	5113	6902	pF
Reverse Transfer Capacitance	C_{rss}		87	122	164	pF
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = 50\text{V}$, $I_D = 20\text{A}$ $V_{GS} = 10\text{V}$, $R_{GEN} = 3\Omega$	-	41	-	ns
Rise Time	t_r		-	69	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	157	-	ns
Fall Time	t_f		-	92	-	ns
Total Gate Charge	Q_g	$V_{DS} = 50\text{V}$, $V_{GS} = 10\text{V}$, $I_D = 20\text{A}$	155	217	293	nC
	Q_{gs}		47	65	88	nC
	Q_{gd}		41	57	77	nC
Diode Forward Voltage	V_{FSD}	$I_S = 20\text{A}$, $V_{GS} = 0$	0.4	0.85	1.2	V

Note 2: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

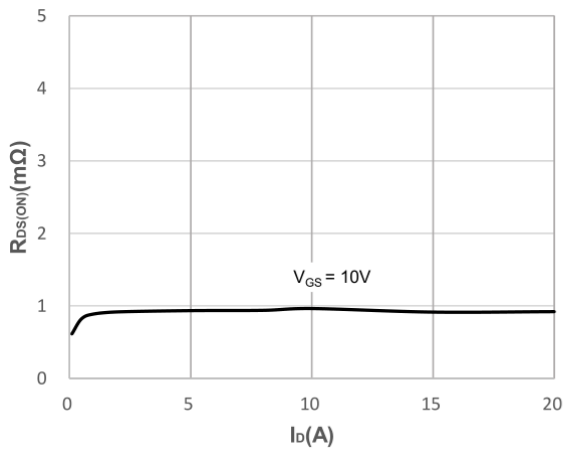
7. Typical electrical and thermal characteristics



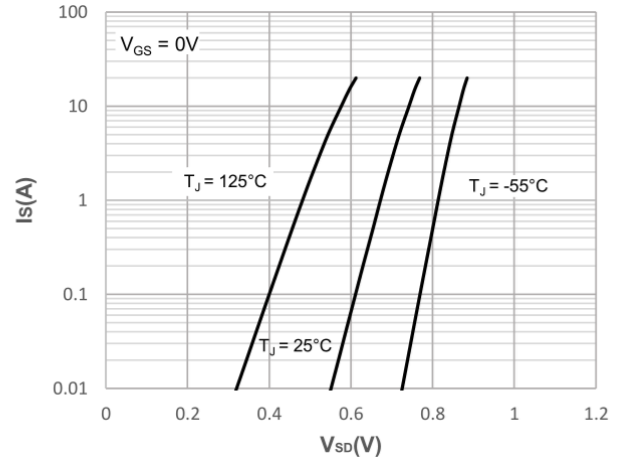
Saturation Characteristics



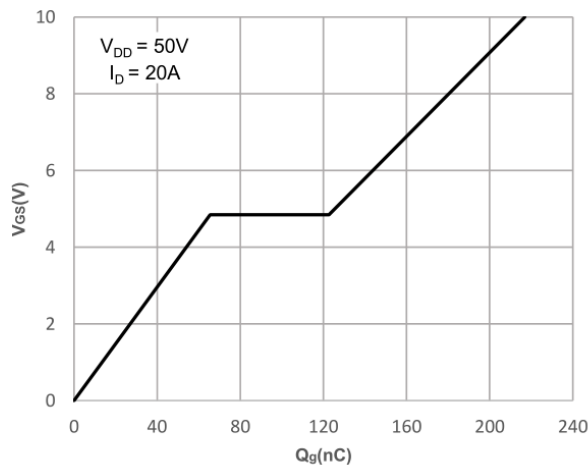
Transfer Characteristics



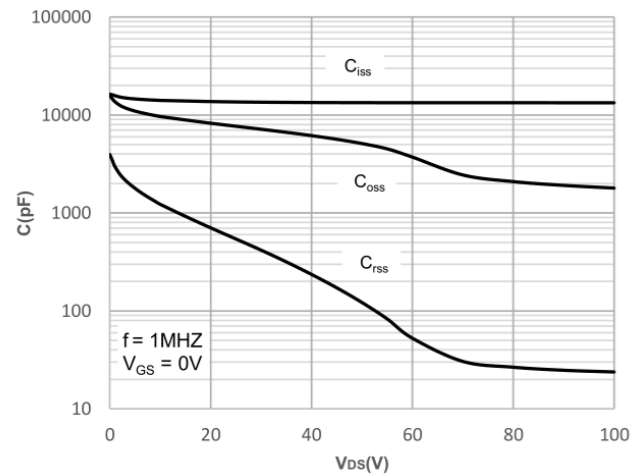
$R_{DS(on)}$ vs. Drain Current



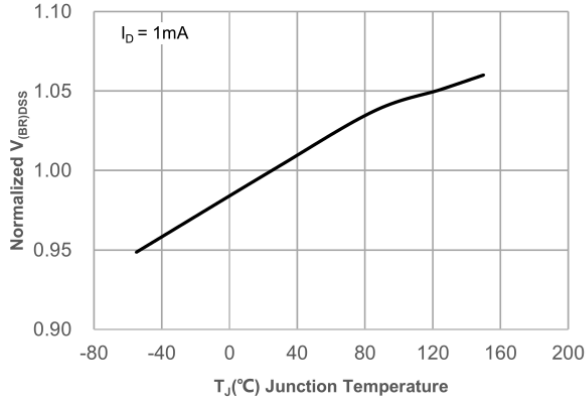
Body-Diode Characteristics



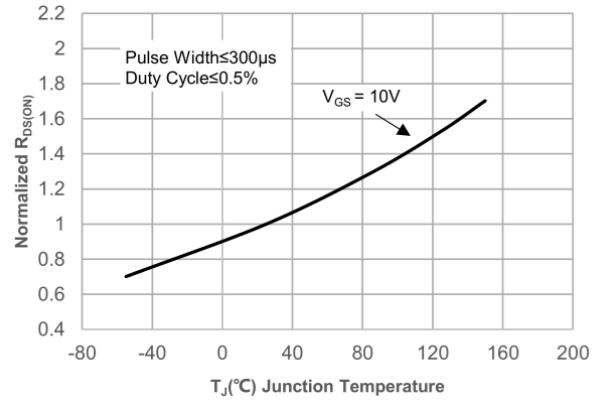
Gate Charge Characteristics



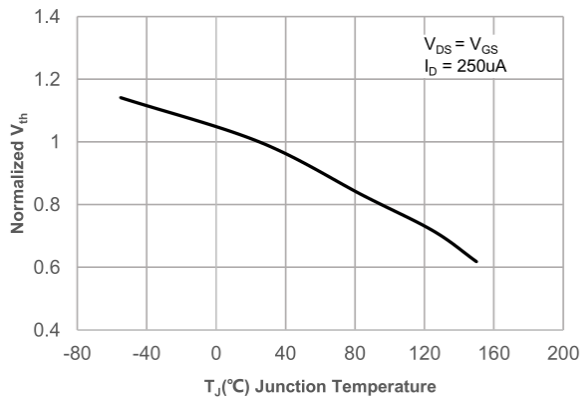
Capacitance Characteristics



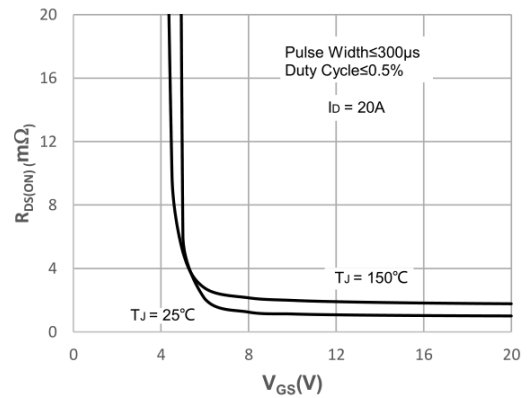
Normalized Breakdown voltage vs.
Junction Temperature



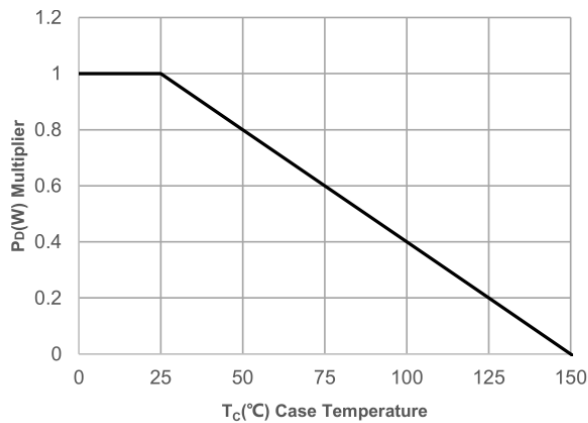
Normalized on Resistance vs.
Junction Temperature



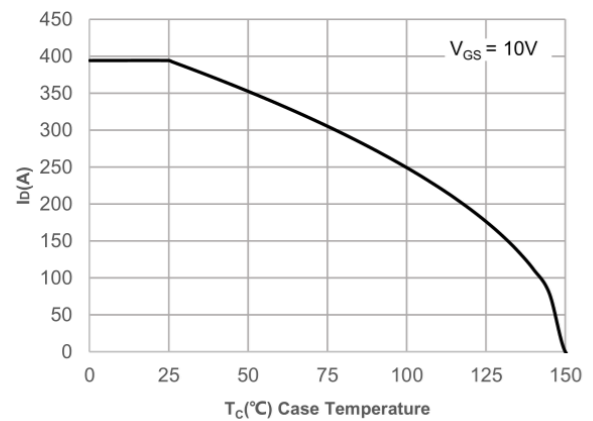
Normalized Threshold Voltage vs.
Junction Temperature



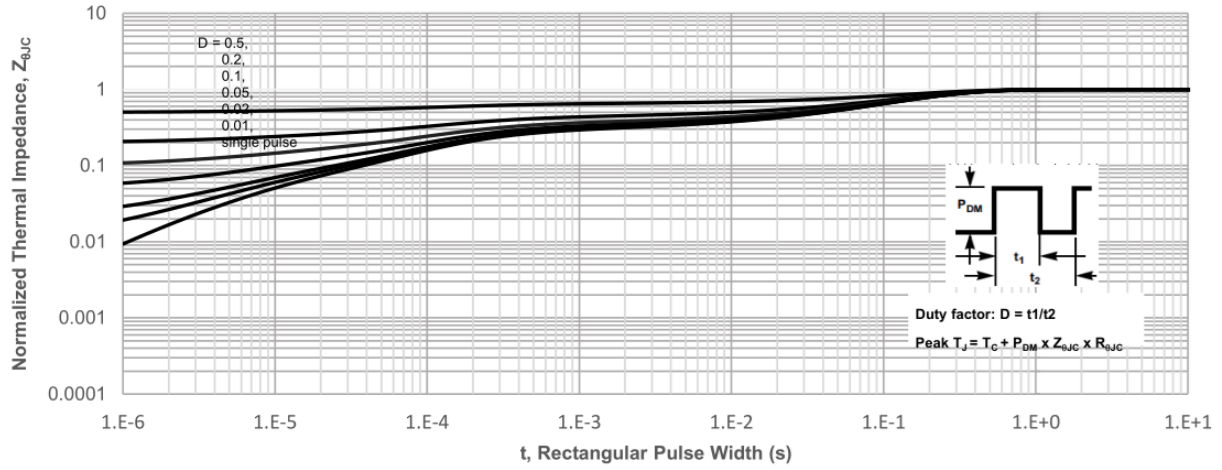
$R_{DS(ON)}$ vs. V_{GS}



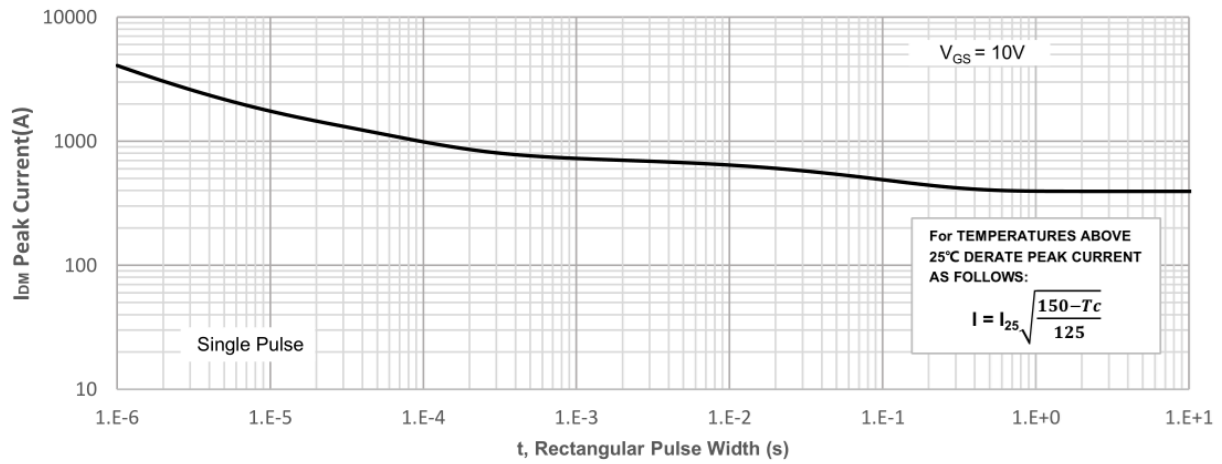
Power De-rating



Current De-rating

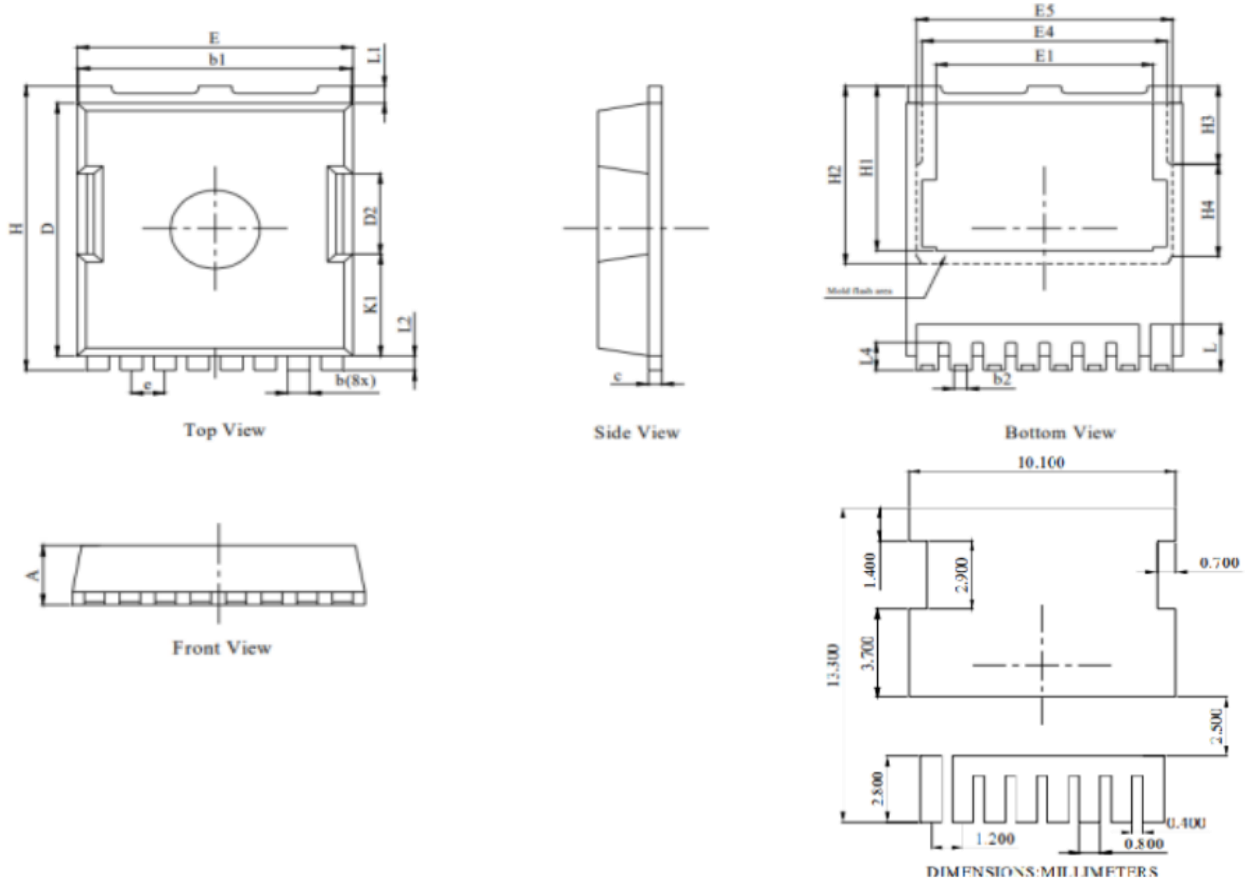


Normalized Maximum Transient Thermal Impedance



Peak Current Capacity

8.Package Dimensions



DIM.	MILLIMETER		
	MIN	NOM	MAX
A	2.20	2.30	2.50
b	0.70	0.80	0.90
b1	9.70	9.80	9.90
b2	0.42	0.46	0.50
C	0.40	0.50	0.65
D	10.28	10.38	10.58
D2	3.30		
E	9.70	9.90	10.10
E1	7.80		
E4	8.80		
E5	9.20		
e	1.20(BSC)		
H	11.48	11.68	11.88
H1	6.55	6.75	6.85
H2	7.30		
H3	3.20		
H4	3.80		
K1	4.18		
L	1.70	1.90	2.10
L1	0.70		
L2	0.60		
L4	1.00	1.15	1.30