

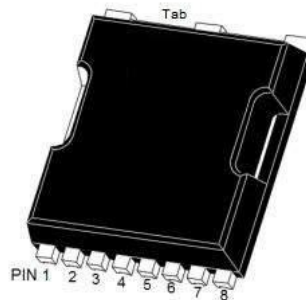
Features

- Uses MOT advanced double trench technology
- Low On-Resistance ($R_{DS(on)} \leq 4.8m\Omega$)
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% avalanche tested
- Pb-free plating; RoHS compliant

Applications

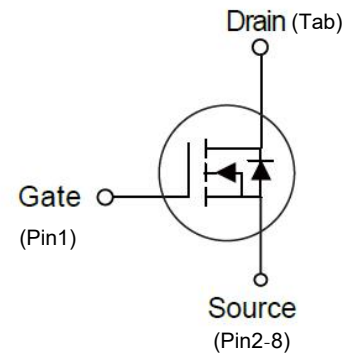
- Battery management
- Motor control and drive
- Synchronous rectification
- Switching applications

Pin configuration (Top view)



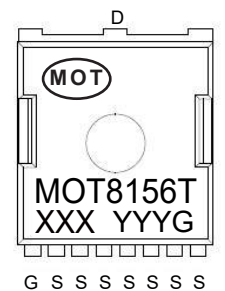
TOLL-8

Symbol



Key Performance Parameters

Parameter	Value	Unit
V_{DS}	85	V
$R_{DS(on),typ.}$	3.8	mΩ
I_D	163	A



XXX=Lot Number
YYY=Year Week
G=Vth Range

Marking

Ordering information

Type/Ordering Code	Package	Marking	Packing&Qty.(pcs)
MOT8156T	TOLL-8	MOT8156T	2000/Reel

■ ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-to-Source Voltage		V _{DS}	85	V
Gate-to-Source Voltage		V _{GS}	±20	V
Continuous Drain Current *	T _C = 25°C	I _D	163	A
	T _C = 100°C	I _D	115	A
Pulsed Drain Current ***		I _{DM}	652	A
Avalanche Energy		E _{AS}	486	mJ
Power Dissipation	T _C = 25°C	P _D	268	W
	T _C = 100°C	P _D	134	W
Junction & Storage Temperature Range		T _J , T _{STG}	-55 to 175	°C
Thermal Resistance, Junction-to-Ambient **		R _{θJA}	56	°C/W
Thermal Resistance, Junction-to-Case**		R _{θJC}	0.56	°C/W

■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static parameter						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}, V_{GS} = 0\text{V}$	85	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 85\text{V}, V_{GS} = 0\text{V}$	-	-	1.0	μA
		$T_J = 55^\circ\text{C}$	-	-	5.0	μA
Gate-Body Leakage Current	I_{GSS}	$V_{DS} = 0\text{V}, V_{GS} = \pm 20\text{V}$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	2.0	-	4.0	V
Static Drain-Source ON-Resistance ^a	$R_{DS(ON)}$	$V_{GS} = 10\text{V}, I_D = 20\text{A}$	-	3.8	4.8	mΩ
Forward Transconductance	g_{FS}	$V_{DS} = 5\text{V}, I_D = 20\text{A}$	10	-	-	S
Diode Forward Voltage ^a	V_{SD}	$I_S = 1\text{A}, V_{GS} = 0\text{V}$	-	-	1	V
Diode Continuous Current	I_S	$T_C = 25^\circ\text{C}$	-	-	163	A
Dynamic parameter						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{V}, V_{DS} = 50\text{V}, f = 1\text{MHz}$	-	4102	-	pF
Output Capacitance	C_{oss}		-	592	-	pF
Reverse Transfer Capacitance ^b	C_{rss}		-	19.8	-	pF
Gate Resistance	R_g	$V_{GS} = 0\text{V}, V_{DS} = 0\text{V}, f = 1\text{MHz}$	-	2.5	-	Ω
Switching parameter ^b						
Total Gate Charge (@ $V_{GS} = 10\text{V}$)	Q_g	$V_{GS} = 0 \text{ to } 10\text{V}$ $V_{DS} = 50\text{V}, I_D = 20\text{A}$	-	69	-	nC
Total Gate Charge (@ $V_{GS} = 6.0\text{V}$)	Q_g		-	44	-	nC
Gate Source Charge	Q_{gs}		-	24	-	nC
Gate Drain Charge	Q_{gd}		-	18.5	-	nC
Turn-On DelayTime	$t_{D(on)}$	$V_{GS} = 10\text{V}, V_{DS} = 50\text{V}$ $R_L = 2.5\Omega, R_{GEN} = 6\Omega$	-	18.0	-	nS
Turn-On Rise Time	t_r		-	23	-	nS
Turn-Off DelayTime	$t_{D(off)}$		-	37	-	nS
Turn-Off Fall Time	t_f		-	15.7	-	nS
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 20\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	64	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F = 20\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$	-	126	-	nC

Notes:

- * Pulse width 300 us, duty cycle 2 %
- ** Surface Mounted on minimum footprint pad area.
- *** Limited by bonding wire
- a : Pulse test ; pulse width 300us, duty cycle 2%
- b : Guaranteed by design, not subject to production testing

ELECTRICAL CHARACTERISTICS

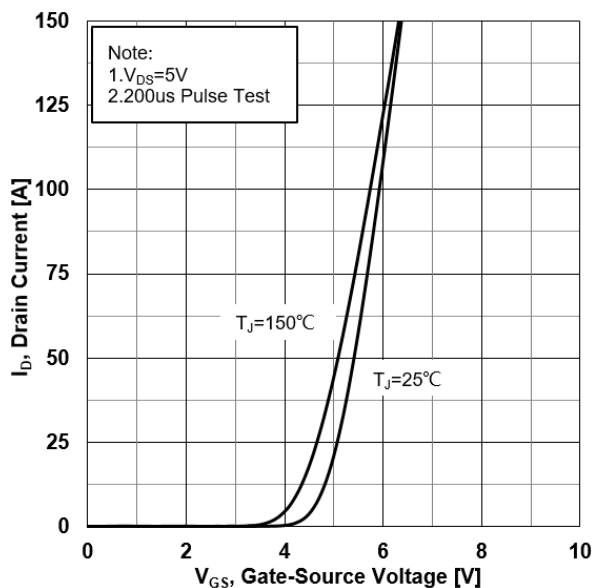


Figure 1. Typical Transfer Characteristics

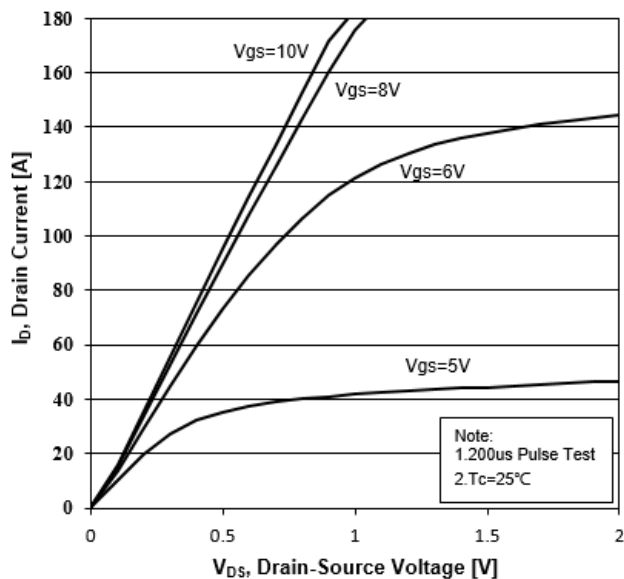


Figure 2. Typical Output Characteristics

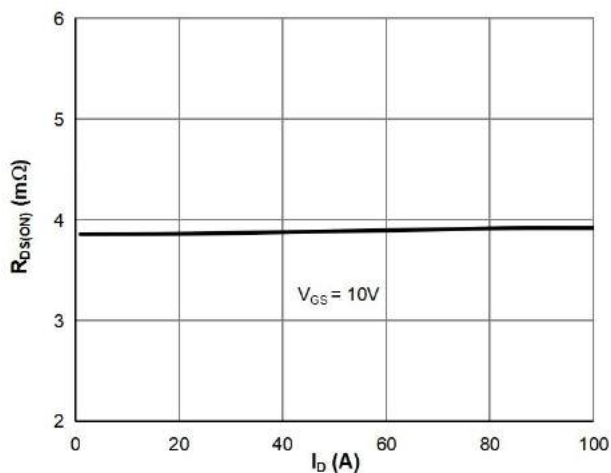


Figure 3: $R_{DS(ON)}$ vs. Drain Current

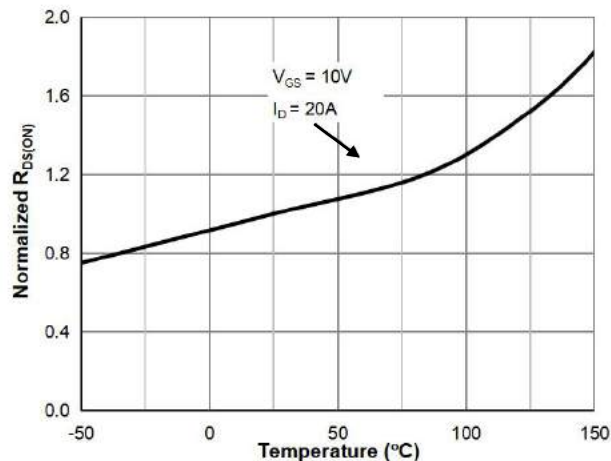


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

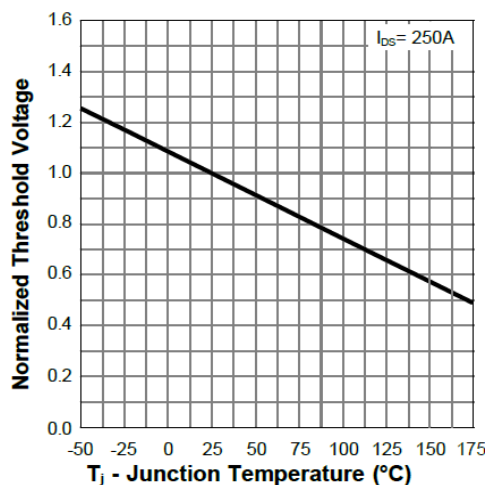


Figure 5. Normalized Threshold Voltage

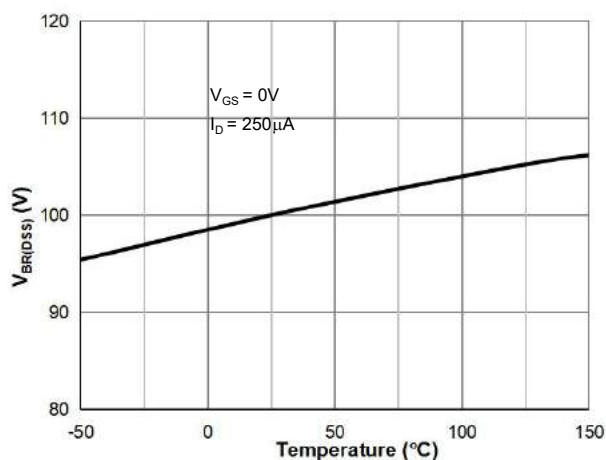


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

■ TYPICAL CHARACTERISTICS(Cont.)

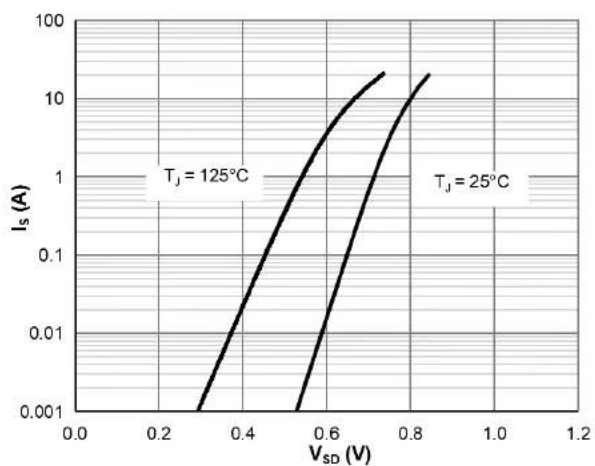


Figure 7: Body-Diode Characteristics

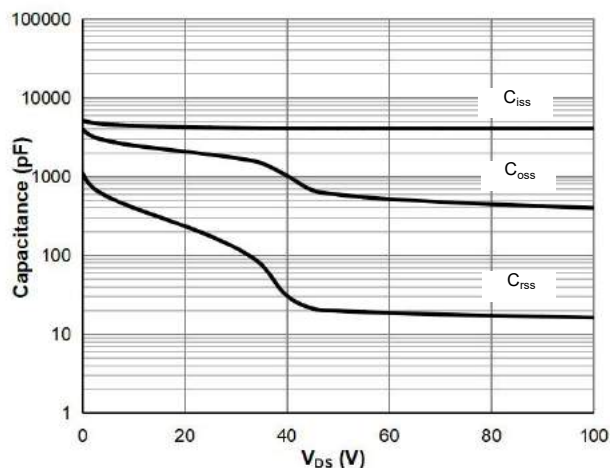


Figure 8: Capacitance Characteristics

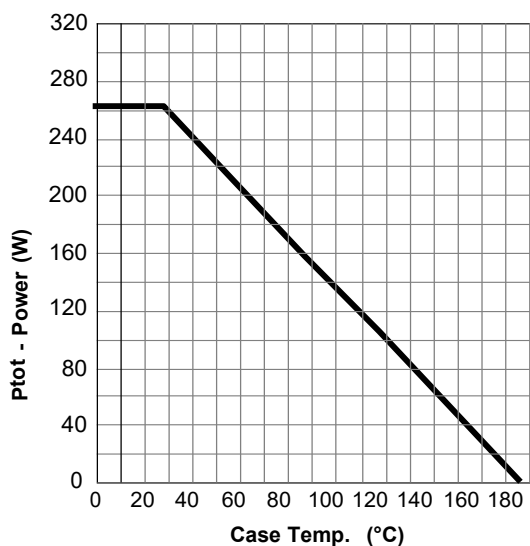


Figure 9: Maximum Power Dissipation vs Case Temp.

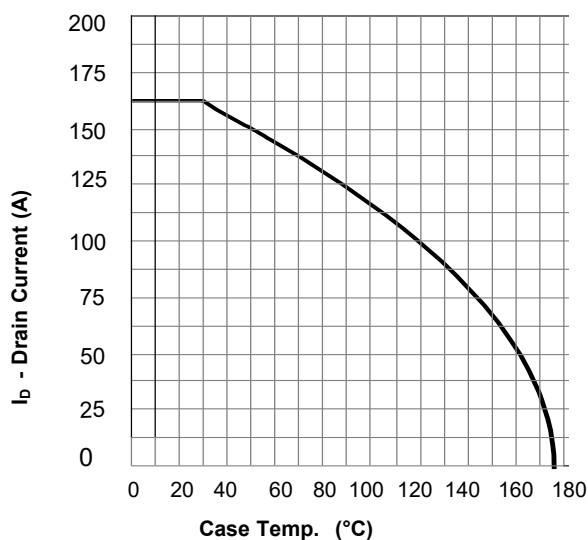


Figure 10: Maximum Continuous Drain Current vs Case Temp.

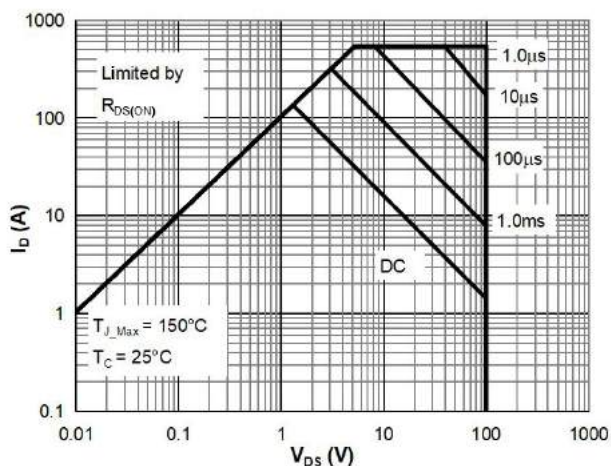


Figure 11: Maximum Safe Operating Area

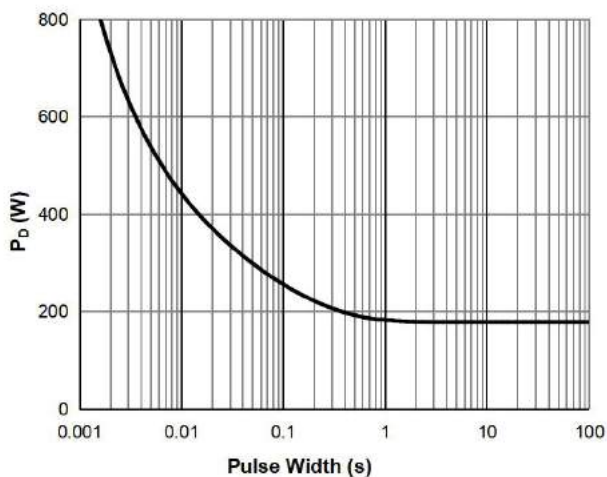


Figure 12: Single Pulse Power Rating, Junction-to-Case

■ TYPICAL CHARACTERISTICS(Cont.)

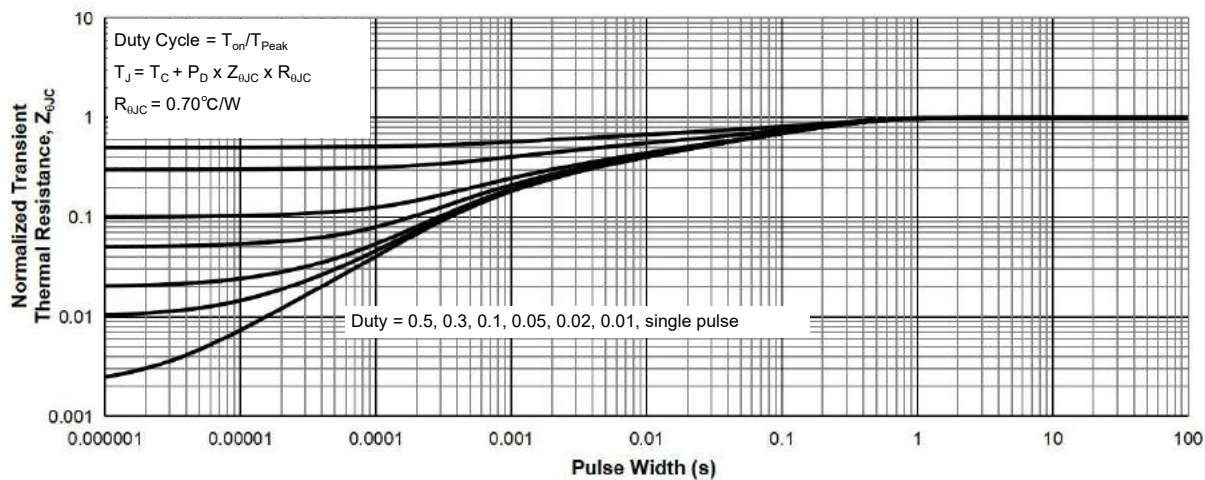
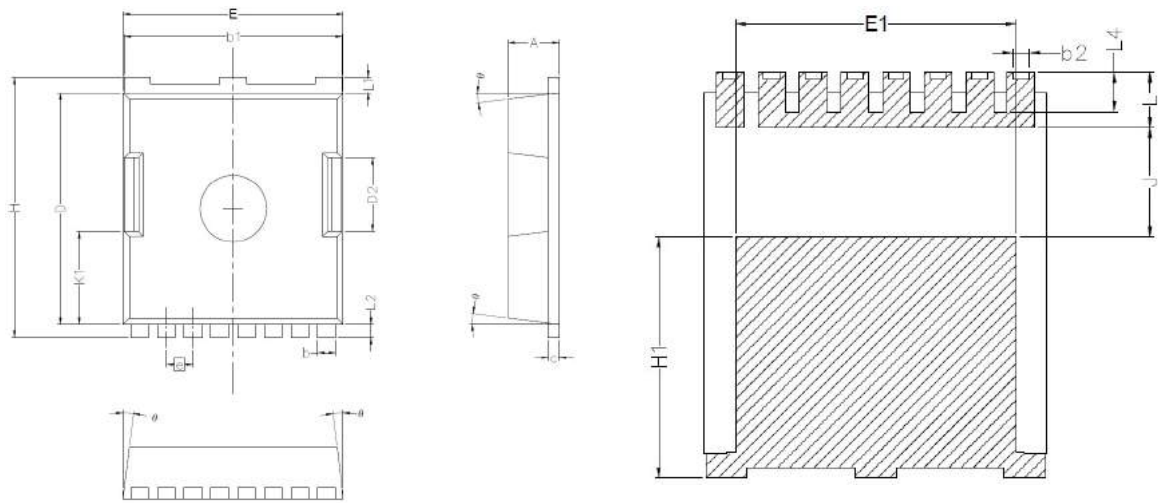


Figure 13: Normalized Maximum Transient Thermal Impedance

■ TOLL-8L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimesions In Millimeters	
	Min.	Max.
A	2.20	2.40
b	0.70	0.90
b1	9.70	9.90
b2	0.42	0.50
c	0.40	0.60
D	10.28	10.58
D2	3.10	3.50
E	9.70	10.10
E1	7.90	8.30
e	1.20BSC	
H	11.48	11.88
H1	6.75	7.15
N	8	
J	3.00	3.30
K1	3.98	4.38
L	1.40	1.80
L1	0.60	0.80
L2	0.50	0.70
L4	1.00	1.30
θ	4°	10°

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