

Features

- Uses MOT advanced double trench technology
- Low On-Resistance ($R_{DS(on)} \leq 5.5m\Omega$)
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% avalanche tested
- Pb-free plating; RoHS compliant

Applications

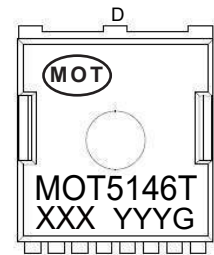
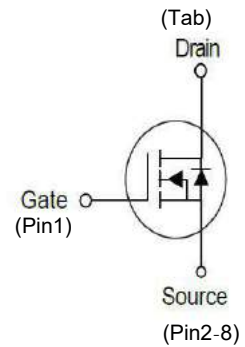
- Battery management
- Motor control and drive
- Synchronous rectification
- Switching applications

Pin configuration (Top view)



TOLL-8

Symbol



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

Marking

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	120	V
$R_{DS(on),typ.}$	4.5	mΩ
I_D	250	A

Ordering information

Type/Ordering Code	Package	Marking	Packing&Qty.(pcs)
MOT5146T	TOLL-8	MOT5146T	2000/Reel

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

Parameter	Symbol	Conditions	Min	Max	Unit
Drain-Source Voltage	V_{DS}	$T_C = 25^\circ\text{C}$	120	-	V
Gate-Source Voltage	V_{GS}	$T_C = 25^\circ\text{C}$	-	± 20	V
Drain Current (DC) *	I_D	$T_C = 25^\circ\text{C}, V_{GS} = 10\text{ V}$	-	250	A
		$T_C = 100^\circ\text{C}, V_{GS} = 10\text{ V}$	-	177	A
Drain Current (Pulsed) ***	I_{DM}	$T_C = 25^\circ\text{C}, V_{GS} = 10\text{ V}$	-	1000	A
Drain power dissipation	P_{tot}	$T_C = 25^\circ\text{C}$	-	330	W
Storage Temperature	T_{stg}		-55	175	$^\circ\text{C}$
Junction Temperature	T_J		-	175	$^\circ\text{C}$
Continuous-Source Current	I_S	$T_C = 25^\circ\text{C}$	-	250	A
Single Pulsed Avalanche Energy	E_{AS}	$V_{DD} = 50\text{ V}, L = 1.0\text{ mH}$	-	1473	mJ
Thermal Resistance- Junction to Ambient**	$R_{\theta JA}$		-	40	$^\circ\text{C/W}$
Thermal Resistance- Junction to Case**	$R_{\theta JC}$		-	0.45	

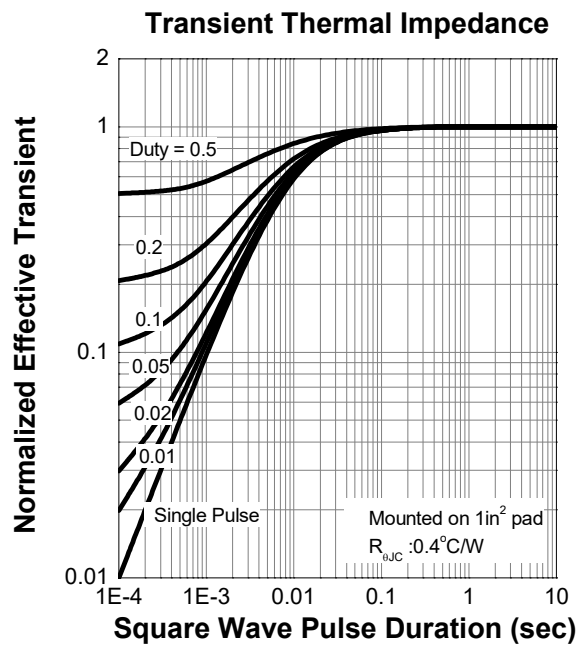
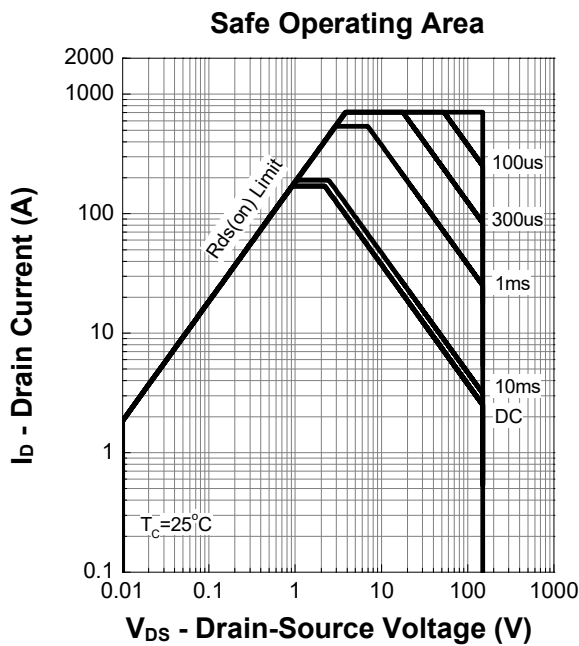
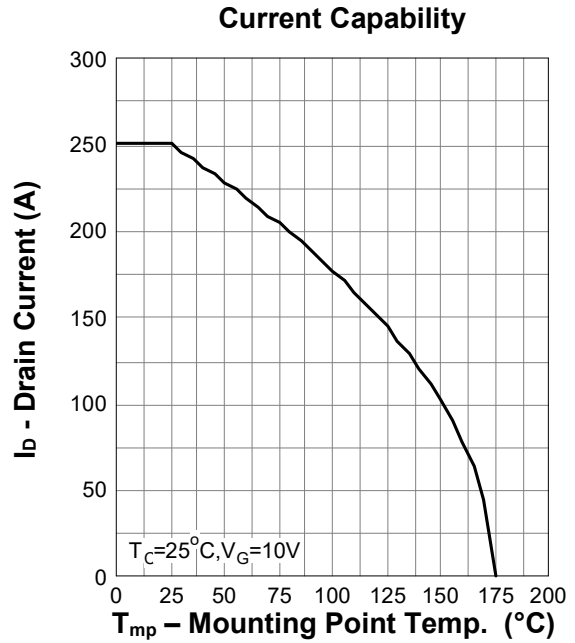
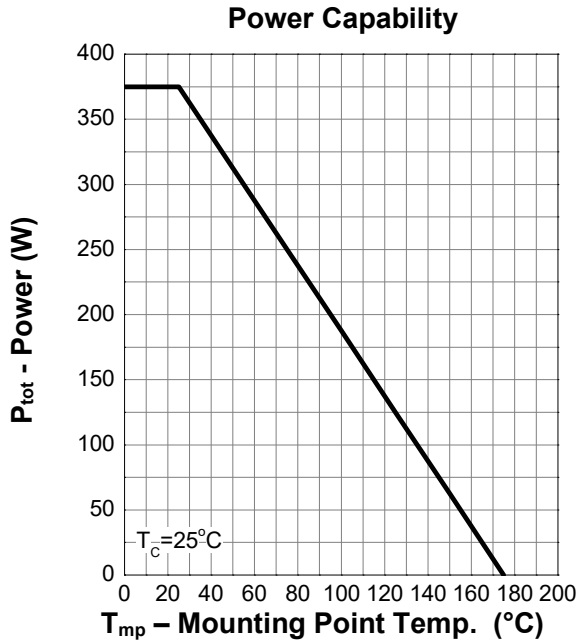
■ ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_{DS} = 250\ \mu\text{A}$	120	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_{DS} = 250\ \mu\text{A}$	2	-	4	V
Drain Leakage Current	I_{DSS}	$V_{DS} = 96\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	μA
Gate Leakage Current	I_{GSS}	$V_{GS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA
On-State Resistance ^a	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_{DS} = 20\text{A}$	-	4.5	5.5	mΩ
		$V_{GS} = 6\text{ V}, I_{DS} = 10\text{A}$	-	6.5	7.5	
Diode Characteristics						
Diode Forward Voltage ^a	V_{SD}	$I_{SD} = 20\text{A}, V_{GS} = 0\text{ V}$	-	-	1.3	V
Reverse Recovery Time	t_{rr}	$I_{SD} = 20\text{A}, V_{GS} = 0\text{ V}$ $di_{SD}/dt = 100\text{ A}/\mu\text{s}$	-	92	-	nS
Reverse Recovery Charge	Q_{rr}		-	337	-	nC
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 20\text{ V}$ Frequency = 1 MHz	-	5100	-	pF
Output Capacitance	C_{oss}		-	1700	-	
Reverse Transfer Capacitance ^b	C_{rss}		-	623	-	
Turn-on Delay Time	$t_d(on)$	$V_{DS} = 60\text{ V}, V_{GEN} = 10\text{ V},$ $R_G = 3.9\ \Omega, R_L = 3\ \Omega,$ $I_{DS} = 20\text{A}$	-	16	-	nS
Turn-on Rise	t_r		-	27	-	
Turn-off Delay Time	$t_d(off)$		-	51	-	
Turn-off Fall Time	t_f		-	27	-	
Gate Charge Characteristics^b						
Total Gate Charge	Q_g	$V_{DS} = 60\text{ V}, V_{GS} = 10\text{ V},$ $I_{DS} = 20\text{A}$	-	80	-	nC
Gate-Source Charge	Q_{gs}		-	24	-	
Gate-Drain Charge	Q_{gd}		-	18	-	

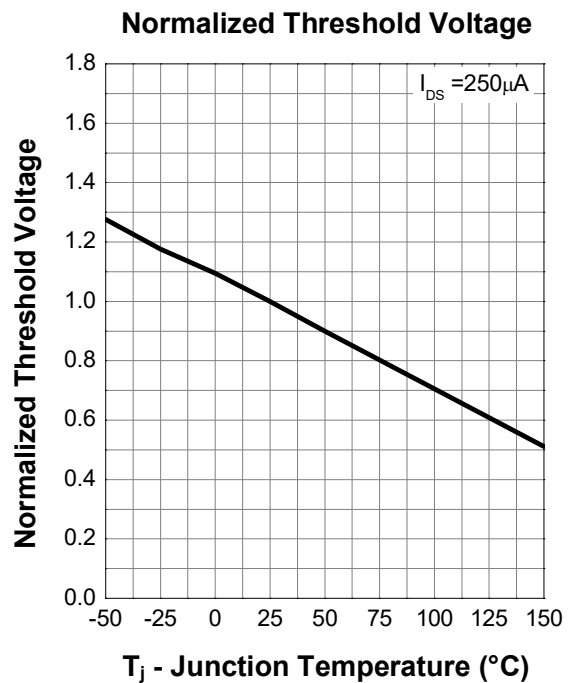
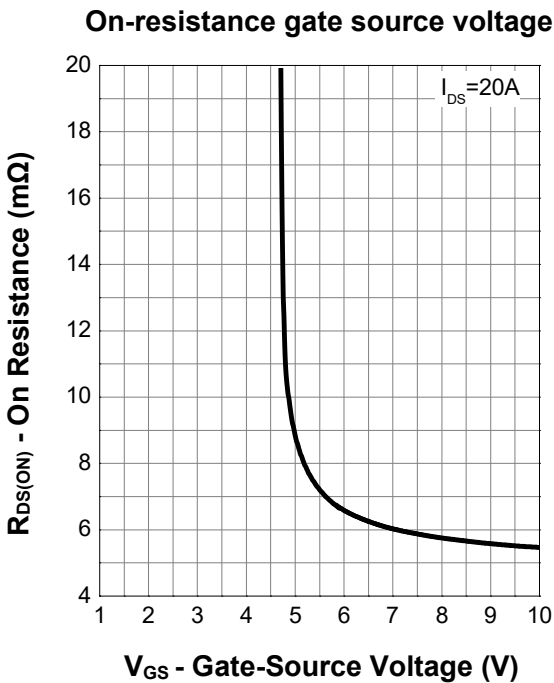
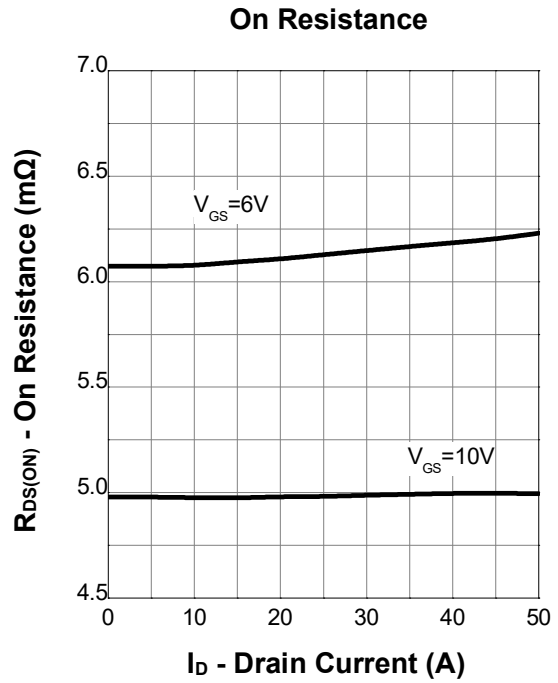
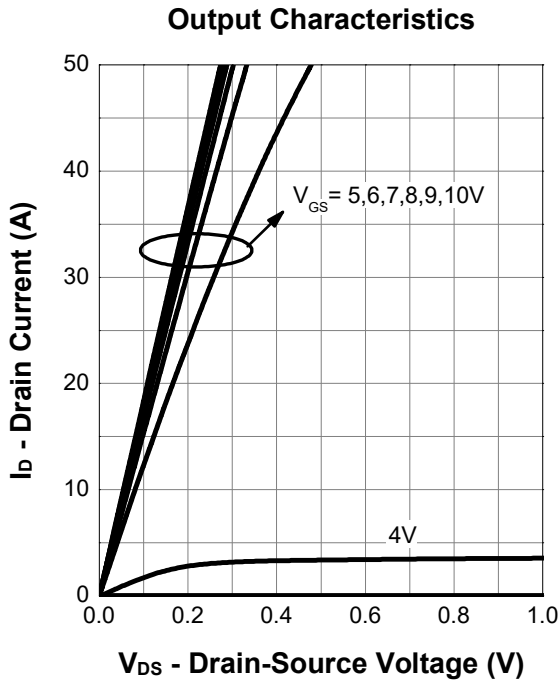
Notes :

- * Pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$
- ** Surface Mounted on minimum footprint pad area.
- *** Limited by bonding wire
- a : Pulse test ; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$
- b : Guaranteed by design, not subject to production testing

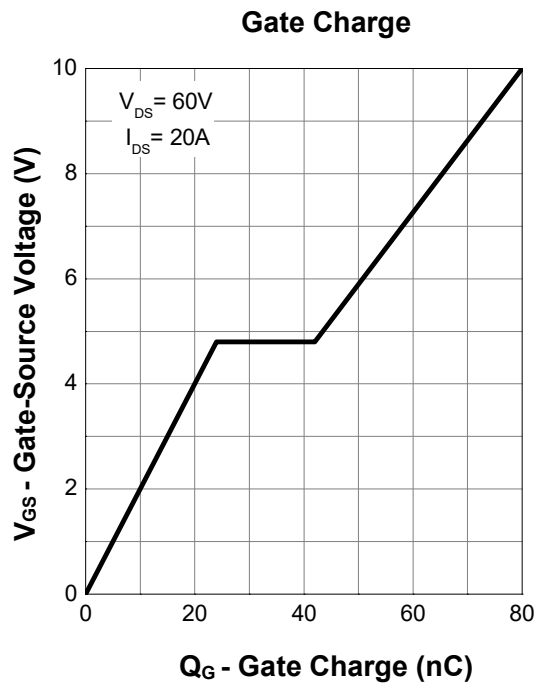
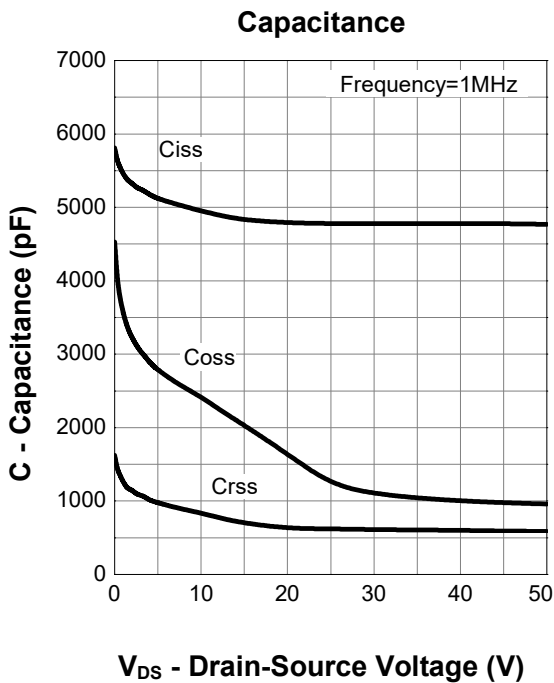
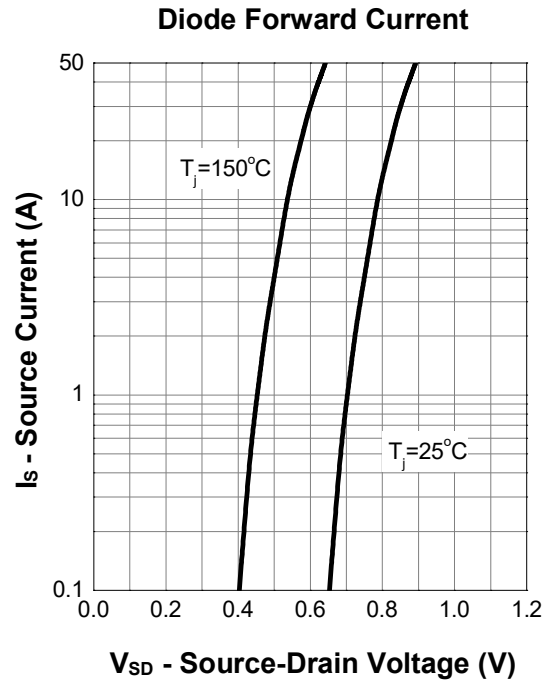
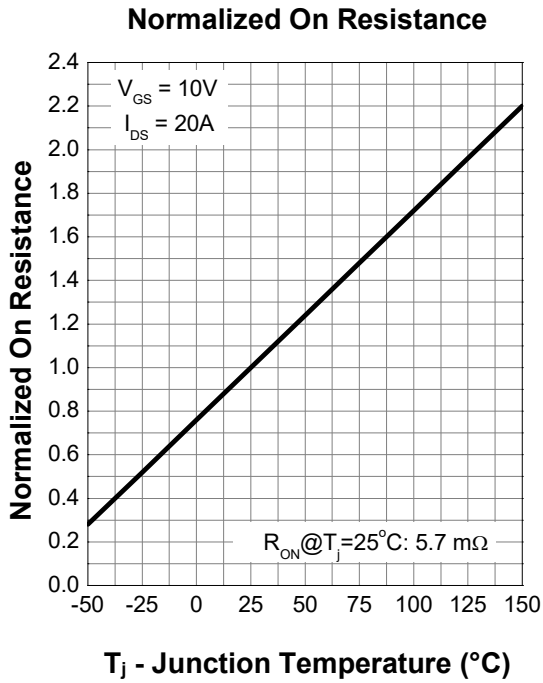
■ TYPICAL CHARACTERISTICS



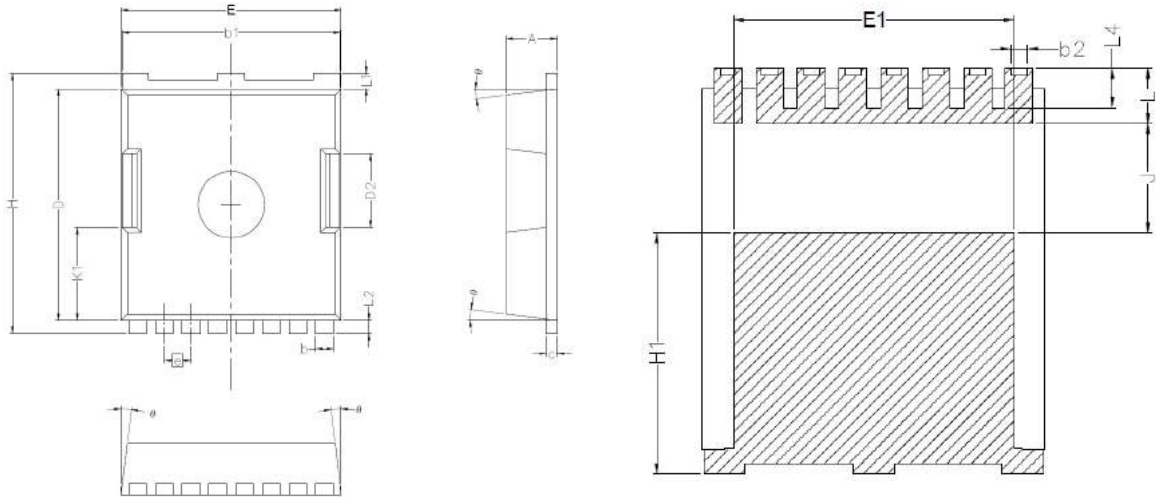
■ TYPICAL CHARACTERISTICS(Cont.)



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■ TOLL-8L PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions 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°

- The information contained herein is subject to change without notice.
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