

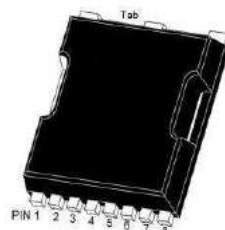
Features

- Uses MOT advanced double trench technology
- Low On-Resistance ($R_{DS(on)} \leq 2.5m\Omega$)
- Low Gate Charge
- Low Reverse transfer capacitances
- 100% avalanche tested
- Pb-free plating; RoHS compliant

Applications

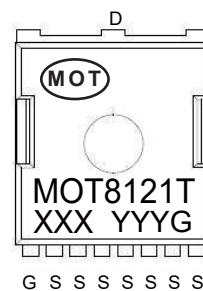
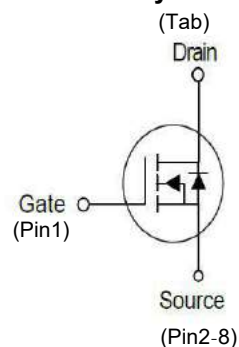
- Battery management
- Motor control and drive
- Synchronous rectification
- Switching applications

Pin configuration (Top view)



TOLL-8

Symbol



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

Marking

Key Performance Parameters

Parameter	Value	Unit
V_{DS}	85	V
$R_{DS(on),typ.}$	2.1	mΩ
I_D	300	A

Ordering information

Type/Ordering Code	Package	Marking	Packing&Qty.(pcs)
MOT8121T	TOLL-8	MOT8121T	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}	$T_C = 25^{\circ}\text{C}$	85	-	V
Gate-Source Voltage	V_{GS}	$T_C = 25^{\circ}\text{C}$	-	± 20	V
Drain Current (DC) *	I_D	$T_C = 25^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	300	A
Drain Current (Pulsed) ***	I_{DM}	$T_C = 25^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	267	A
		$T_C = 100^{\circ}\text{C}, V_{GS} = 10\text{ V}$	-	1200	A
Drain power dissipation	P_{tot}	$T_C = 25^{\circ}\text{C}$	-	600	W
Storage Temperature	T_{stg}		-55	175	$^{\circ}\text{C}$
Junction Temperature	T_J		-	175	$^{\circ}\text{C}$
Continuous-Source Current	I_S	$T_C = 25^{\circ}\text{C}$	-	300	A
Single Pulsed Avalanche Energy	E_{AS}	$V_{DD} = 40\text{ V}, L = 0.5\text{ mH}$	-	1980	mJ
Thermal Resistance- Junction to Ambient**	$R_{\theta JA}$		-	40	$^{\circ}\text{C/W}$
Thermal Resistance- Junction to Case**	$R_{\theta JC}$		-	0.25	

■ ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

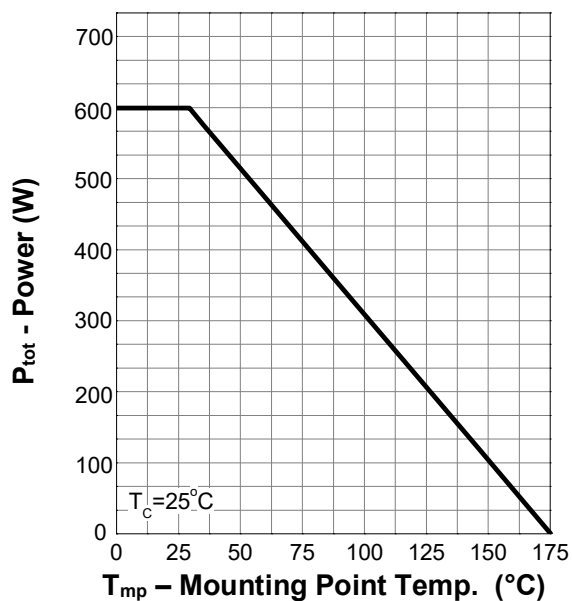
Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0 V, I _{DS} = 250 μA	85	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	2	-	4	V
Drain Leakage Current	I _{DSS}	V _{DS} = 80 V, V _{GS} = 0 V	-	-	1	μA
Gate Leakage Current	I _{GSS}	V _{GS} = 0 V, V _{GS} = ± 20 V	-	-	±100	nA
On-State Resistance ^a	R _{DS(ON)}	V _{GS} = 10 V, I _{DS} = 30A	-	2.1	2.5	mΩ
Diode Characteristics						
Diode Forward Voltage ^a	V _{SD}	I _{SD} = 30A, V _{GS} = 0 V	-	-	1.2	V
Reverse Recovery Time	t _{rr}	I _{DS} = 30A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs	-	80	-	nS
Reverse Recovery Charge	Q _{rr}		-	196	-	nC
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 20 V Frequency = 1 MHz	-	8637	-	pF
Output Capacitance	C _{oss}		-	3749	-	
Reverse Transfer Capacitance ^b	C _{rss}		-	1752	-	
Turn-on Delay Time	t _{d (on)}	V _{DS} = 40 V, V _{GEN} = 10 V, R _G = 4.5 Ω, R _L = 1.3 Ω, I _{DS} = 30A	-	32	-	nS
Turn-on Rise	t _r		-	115	-	
Turn-off Delay Time	t _{d (off)}		-	93	-	
Turn-off Fall Time	t _f		-	140	-	
Gate Charge Characteristics ^b						
Total Gate Charge	Q _g	V _{DS} = 40 V, V _{GS} = 10 V, I _{DS} = 30A	-	138	-	nC
Gate-Source Charge	Q _{gs}		-	39	-	
Gate-Drain Charge	Q _{gd}		-	36	-	

Notes :

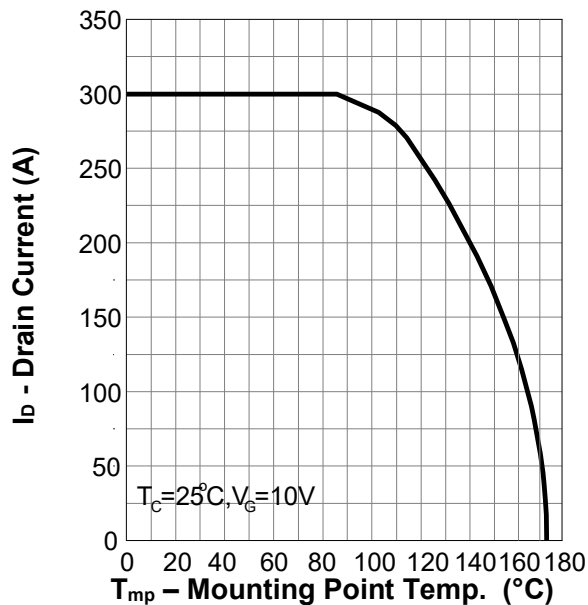
- * Pulse width ≤ 300 μs, duty cycle ≤ 2 %
- ** Surface Mounted on minimum footprint pad area.
- *** Limited by bonding wire
- a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%
- b : Guaranteed by design, not subject to production testing

■ TYPICAL CHARACTERISTICS

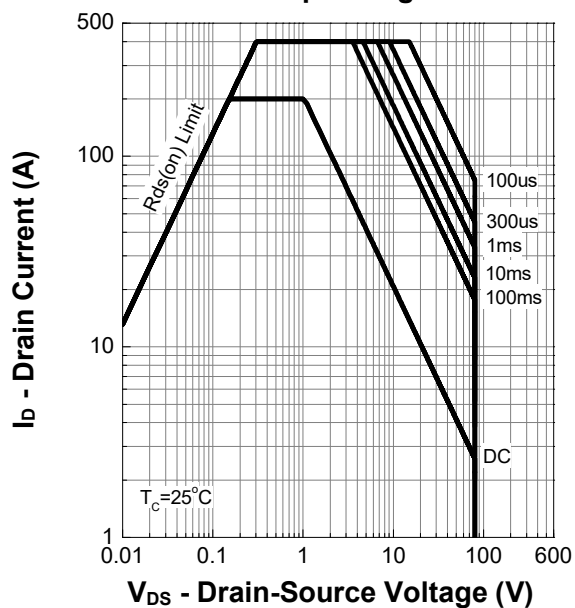
Power Capability



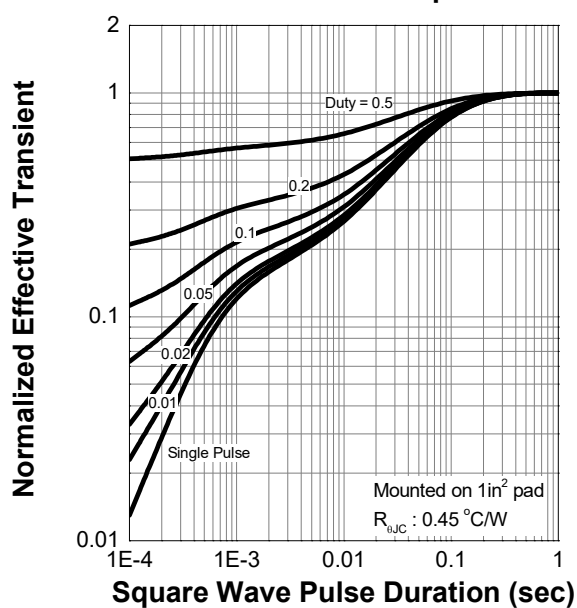
Current Capability



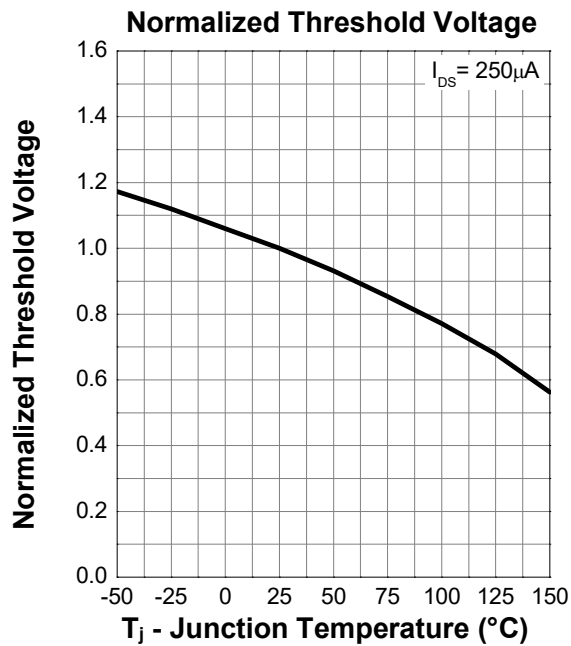
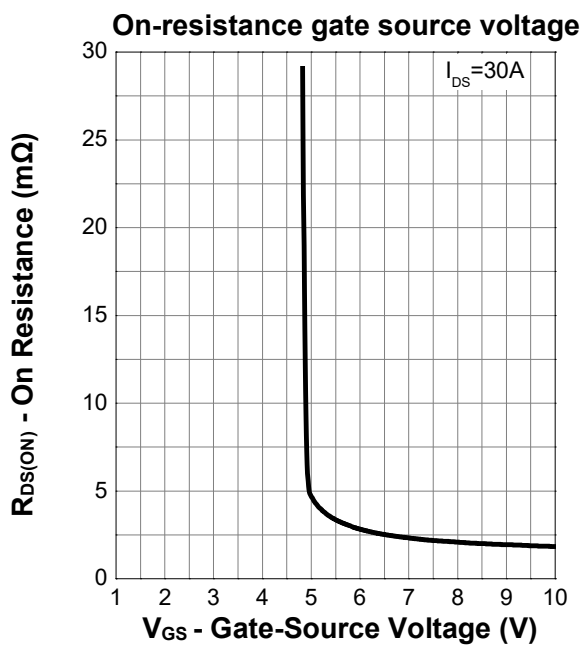
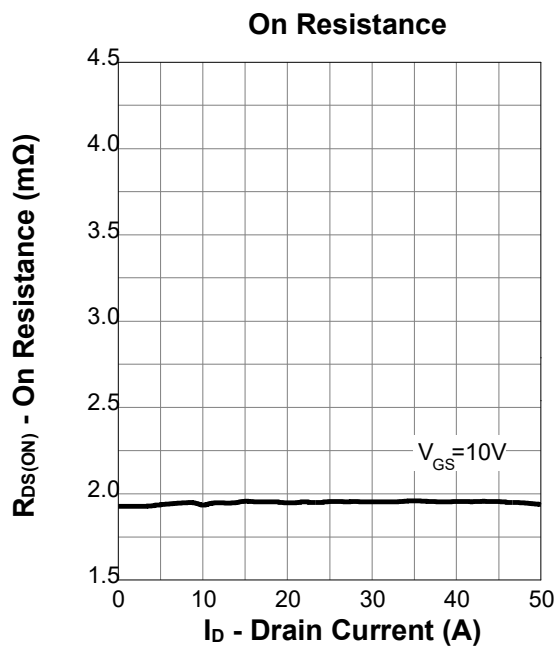
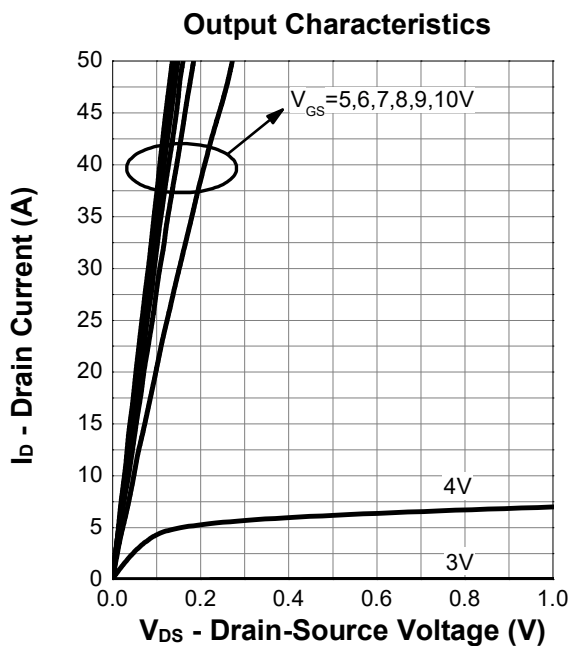
Safe Operating Area



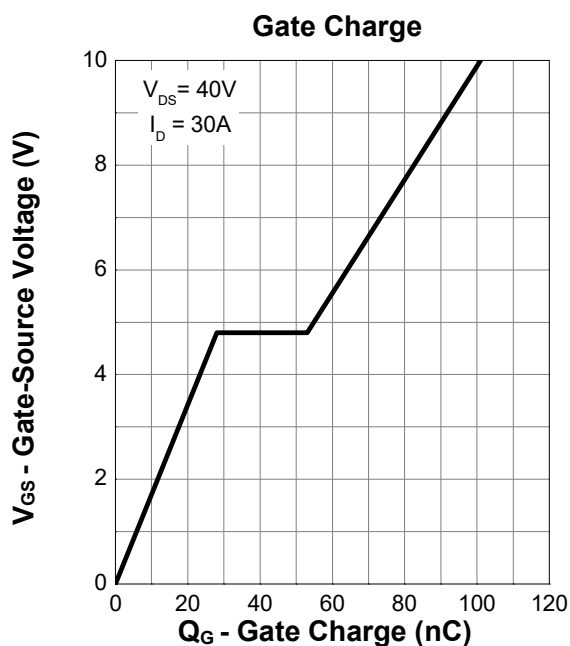
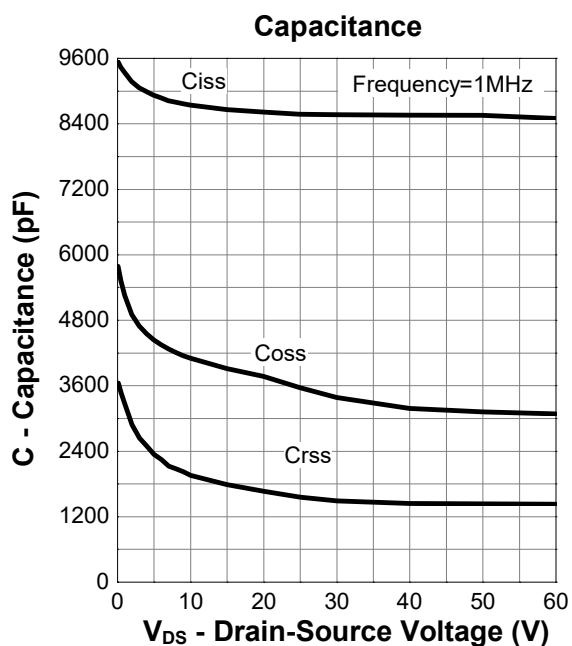
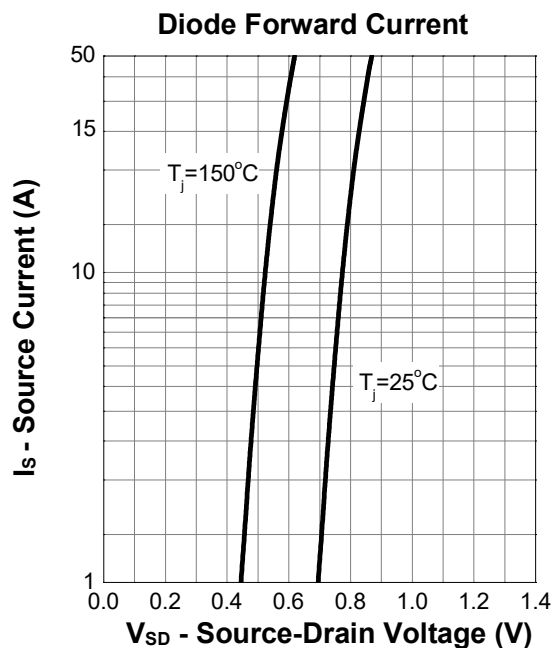
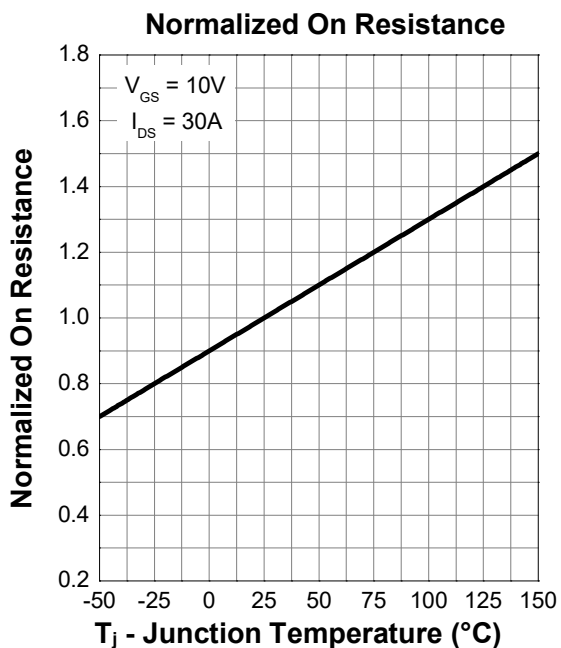
Transient Thermal Impedance



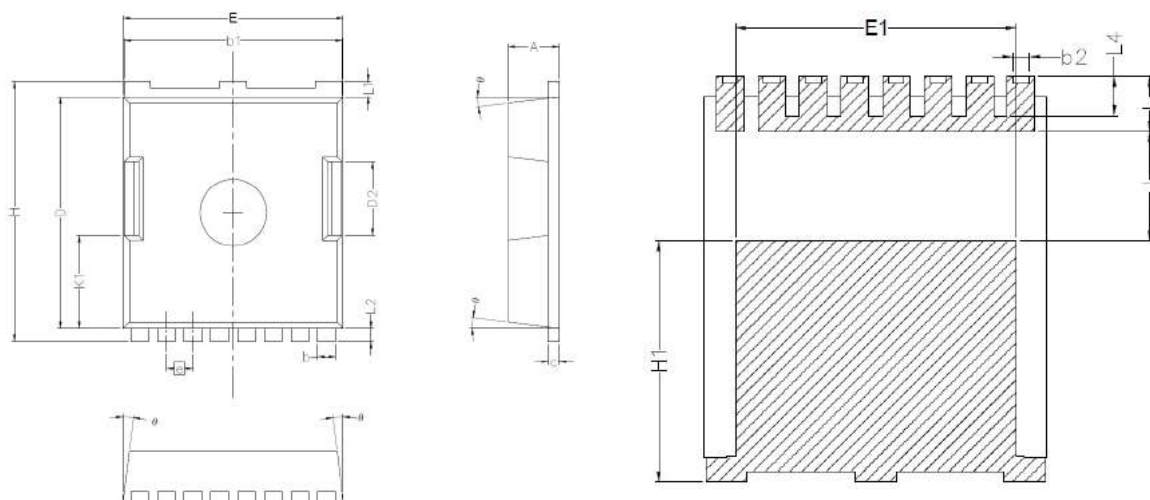
■ TYPICAL CHARACTERISTICS(Cont.)



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■ 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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