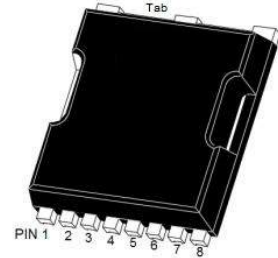


■ PRODUCT CHARACTERISTICS

| | |
|-------------------------------|-------|
| VDSS | 60V |
| $R_{DS(on)Typ}(V_{GS} = 10V)$ | 1.5mΩ |
| ID | 229A |

■ FEATURES

Surface-mounted package
Advanced trench cell design
Super trench

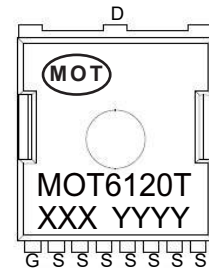


TOLL-8L

■ APPLICATIONS

High power system inverter
Light electric vehicles
BMS
Drones

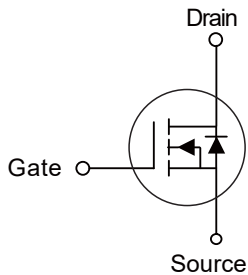
Pin configuration (Top view)



XXX = Lot Number
YYYY = Year Week

Marking

■ SYMBOL



Order information

| Device | Package | Shipping |
|-------------|---------|----------------|
| MOT6120T/TR | TOLL-8L | 2000/Tape&Reel |

■ ABSOLUTE MAXIMUM RATINGS (T_C = 25°C unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Max | Unit |
|---|------------------|---|-----|------|------|
| Drain-Source Voltage | V _{DS} | T _C = 25 °C | 60 | - | V |
| Gate-Source Voltage | V _{GS} | T _C = 25 °C | - | ±20 | V |
| Drain Current (DC) * | I _D | T _C = 25 °C, V _{GS} = 10 V | - | 229 | A |
| | | T _C = 100 °C, V _{GS} = 10 V | - | 162 | A |
| Drain Current (Pulsed) *** | I _{DM} | T _C = 25 °C, V _{GS} = 10 V | - | 640 | A |
| Drain power dissipation | P _{tot} | T _C = 25 °C | - | 300 | W |
| Storage Temperature | T _{stg} | | -55 | 175 | °C |
| Junction Temperature | T _J | | - | 175 | °C |
| Continuous-Source Current | I _S | T _C = 25 °C | - | 229 | A |
| Single Pulsed Avalanche Energy | E _{AS} | V _{DD} = 50V , L= 1.0 mH | - | 1512 | mJ |
| Thermal Resistance- Junction to Ambient** | R _{θJA} | | - | 42 | °C/W |
| Thermal Resistance- Junction to Case** | R _{θJC} | | - | 0.5 | |

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

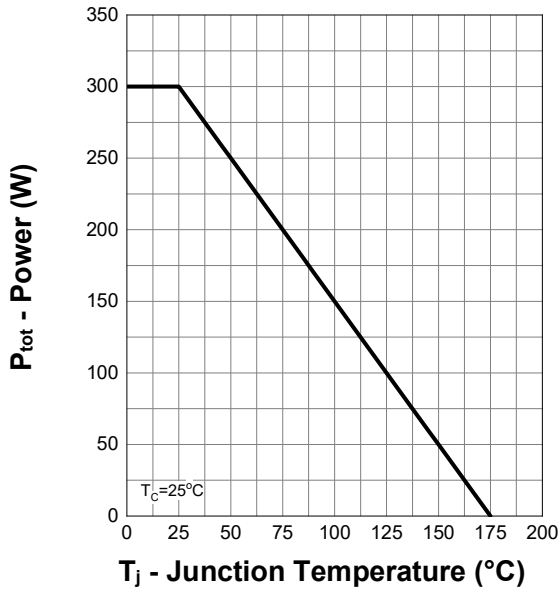
| Parameter | Symbol | Conditions | Min | Typ | Max | Unit |
|--|---------------------|--|-----|-------|------|------|
| Static Characteristics | | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | V _{GS} = 0 V, I _{DS} = 250 μA | 60 | - | - | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _{DS} = 250 μA | 1 | - | 3 | V |
| Drain Leakage Current | I _{DSS} | V _{DS} = 48 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} = 50A | - | 1.5 | 2.0 | mΩ |
| | | V _{GS} = 6 V, I _{DS} = 30A | - | 2.4 | 2.7 | |
| Diode Characteristics | | | | | | |
| Diode Forward Voltage ^a | V _{SD} | I _{SD} = 50A, V _{GS} = 0 V | - | - | 1.3 | V |
| Reverse Recovery Time | t _{rr} | I _{DS} = 50A, V _{GS} = 0 V dI _{SD} /dt = 100 A/μs | - | 18 | - | nS |
| Reverse Recovery Charge | Q _{rr} | | - | 21 | - | nC |
| Dynamic Characteristics | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0 V, V _{DS} = 30 V Frequency = 1 MHz | - | 15321 | - | pF |
| Output Capacitance | C _{oss} | | - | 545 | - | |
| Reverse Transfer Capacitance ^b | C _{riss} | | - | 94 | - | |
| Turn-on Delay Time | t _{d(on)} | V _{DS} = 20 V, V _{GEN} = 10 V, R _G = 3.9 Ω, R _L = 0.6 Ω, I _{DS} = 50A | - | 25 | - | nS |
| Turn-on Rise | t _r | | - | 113 | - | |
| Turn-off Delay Time | t _{d(off)} | | - | 198 | - | |
| Turn-off Fall Time | t _f | | - | 122 | - | |
| Gate Charge Characteristics^b | | | | | | |
| Total Gate Charge | Q _g | V _{DS} = 30 V, V _{GS} = 10 V, I _{DS} = 50A | - | 254 | - | nC |
| Gate-Source Charge | Q _{gs} | | - | 59 | - | |
| Gate-Drain Charge | Q _{gd} | | - | 31 | - | |

Notes :

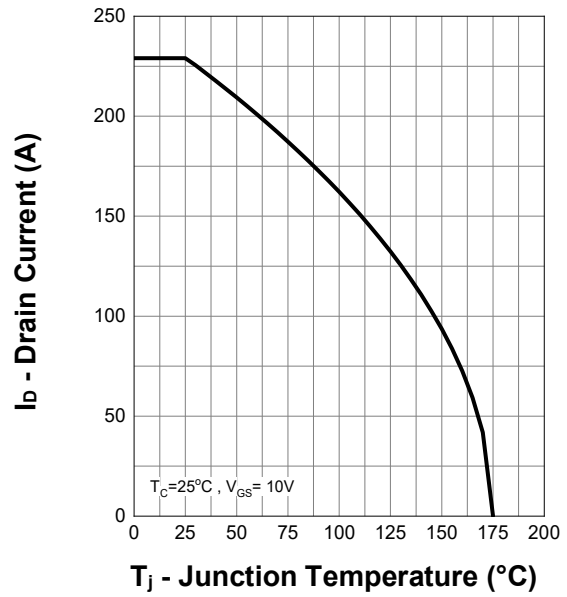
- * Pulse width ≤ 300 μs, duty cycle ≤ 2 %
- ** Surface Mounted on minimum footprint pad area.
- *** Limited by bonding wire
- a : Pulse test ; pulse width ≤ 300 μs, duty cycle ≤ 2%
- b : Guaranteed by design, not subject to production testing

■ TYPICAL CHARACTERISTICS

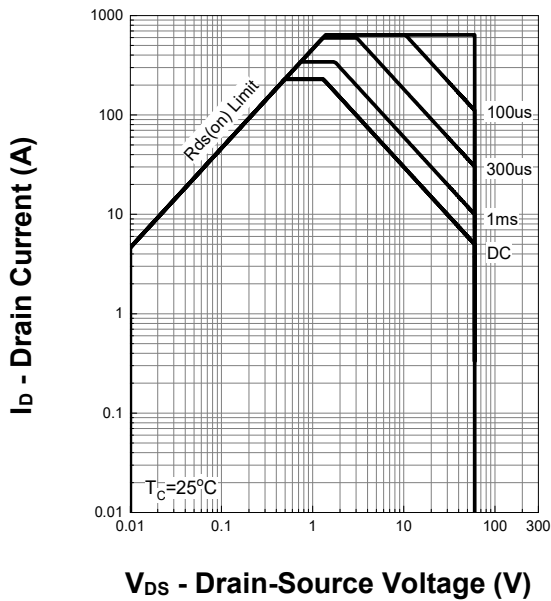
Power Capability



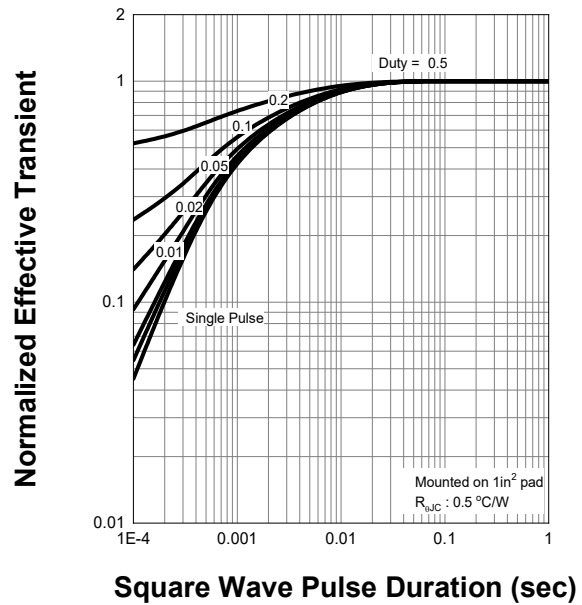
Current Capability



Safe Operating Area

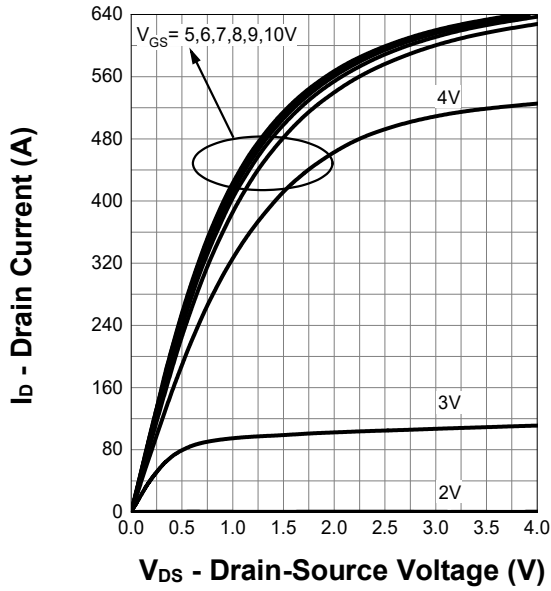


Transient Thermal Impedance

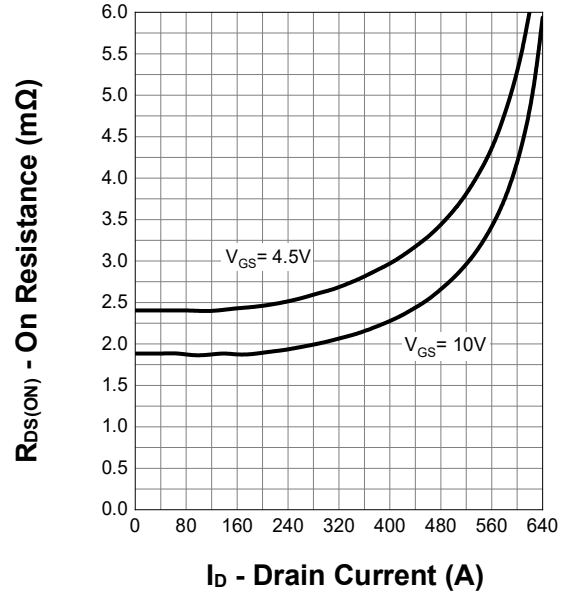


■ TYPICAL CHARACTERISTICS(Cont.)

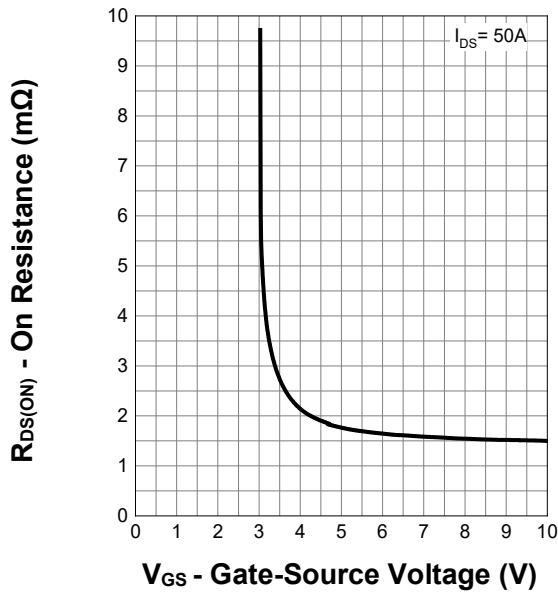
Output Characteristics



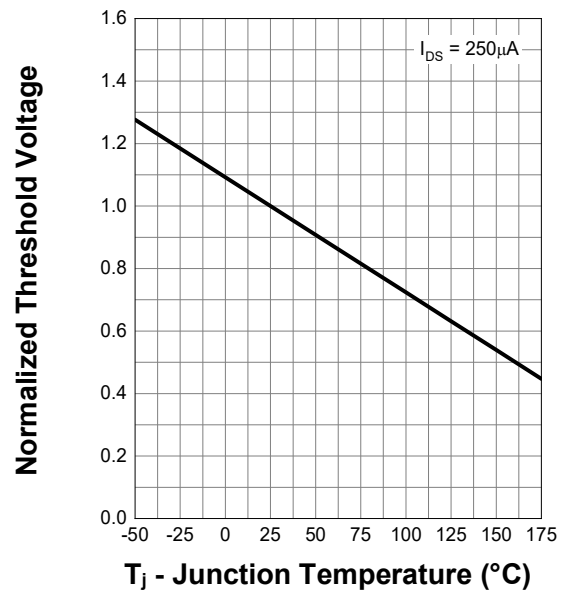
On Resistance



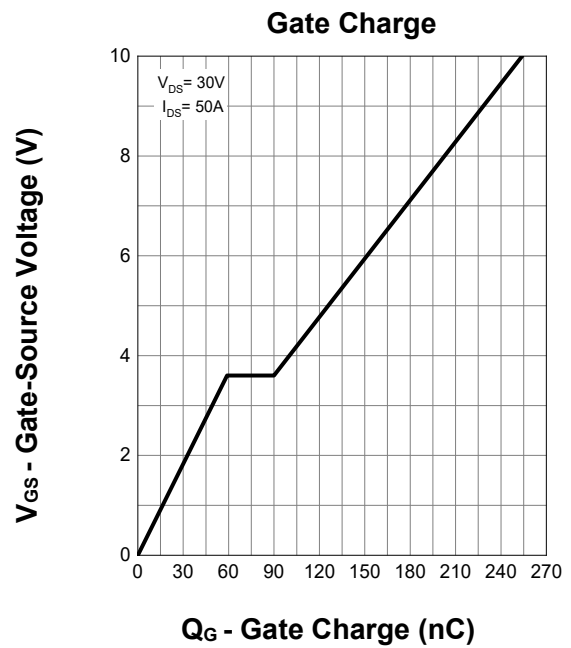
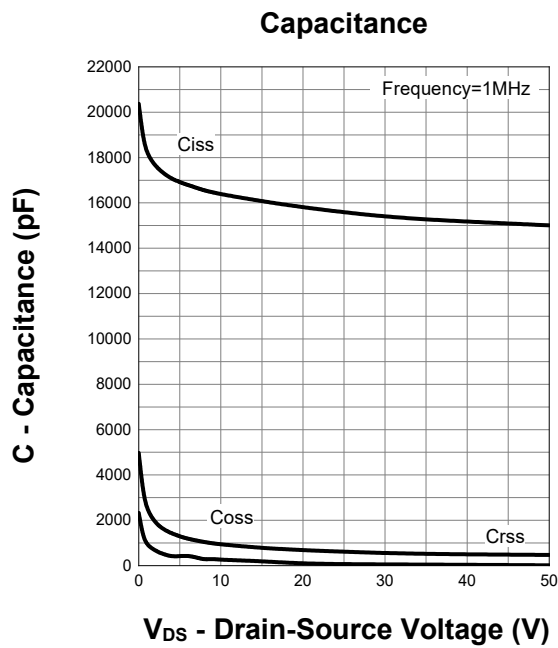
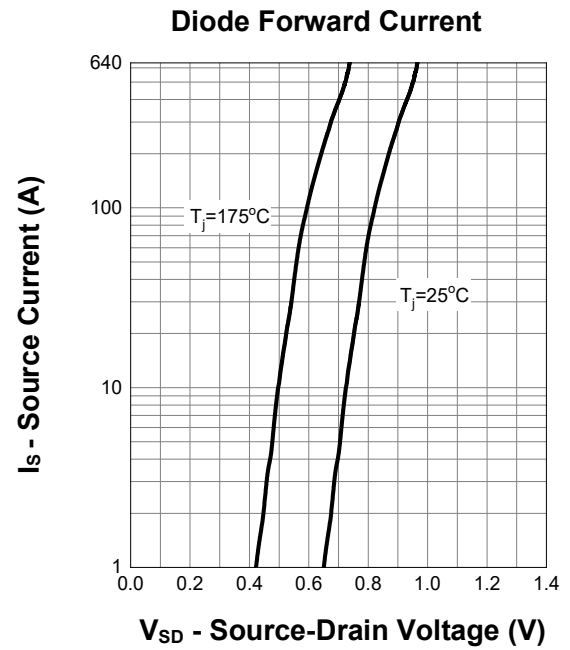
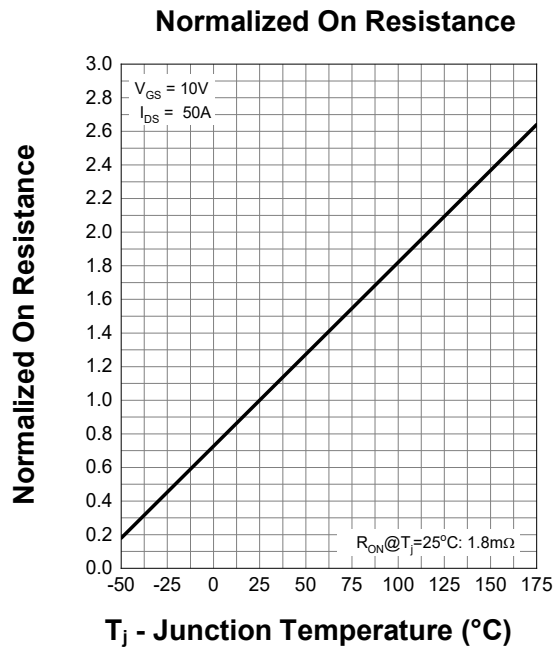
Transfer Characteristics



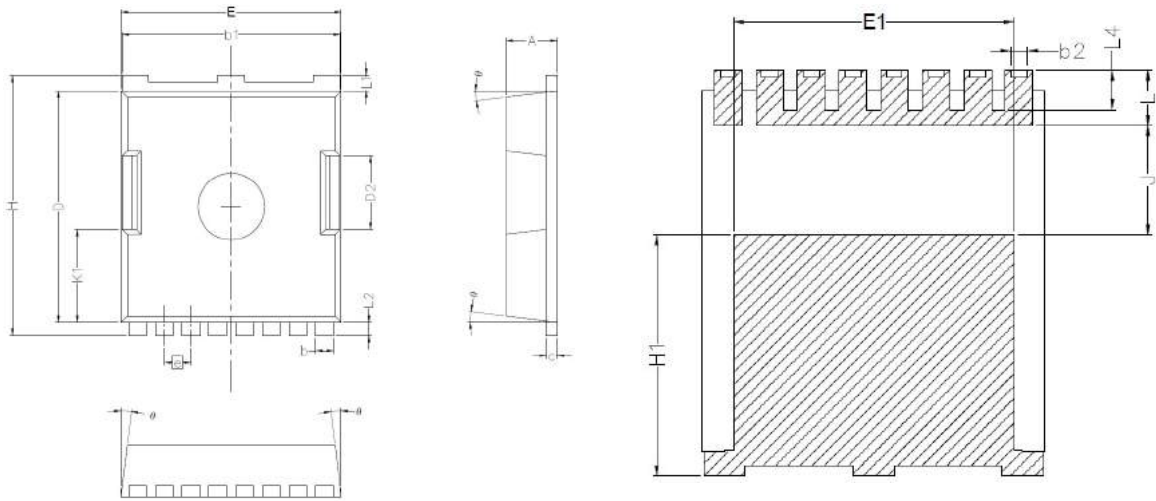
Normalized Threshold Voltage



■ TYPICAL CHARACTERISTICS(Cont.)



■ 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° |

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