

PRODUCT CHARACTERISTICS

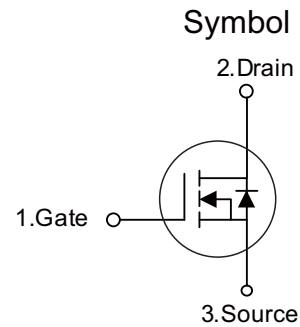
VDSS	600V
$R_{DS(on)typ}(V_{GS}=10V)$	2.4Ω
Qg@type	20nC
ID	4A

APPLICATIONS

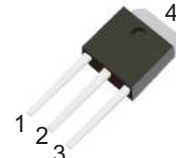
- High frequency switching mode power supply
- Electronic ballast
- LED power supply

FEATURES

- * Ultra Low Gate Charge
- * Fast Switching Capability
- * Avalanche Energy Specified
- * Improved dv/dt Capability, high Ruggedness



TO-252



TO-251

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT4N60C	TO-251	70 pieces/Tube
N/A	MOT4N60D	TO-252	2500 pieces/Reel

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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	600	V
Gate-Source Voltage		V _{GSS}	±30	V
Continuous Drain Current		I _D	4	A
Pulsed Drain Current (Note 2)		I _{DM}	8	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	126	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.8	V/ns
Power Dissipation	TO-251/TO-252	P _D	47	W
Junction Temperature		T _J	+150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.

3. $L = 30\text{mH}$, $I_{AS} = 2.9\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$

4. $I_{SD} \leq 4\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ\text{C}$

THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-251/TO-252	θ_{JA}	110	°C/W
Junction to Case	TO-251/TO-252	θ_{JC}	2.65	°C/W

Note: Device mounted on FR-4 substrate P_C board, 2oz copper, with 1inch square copper plate.

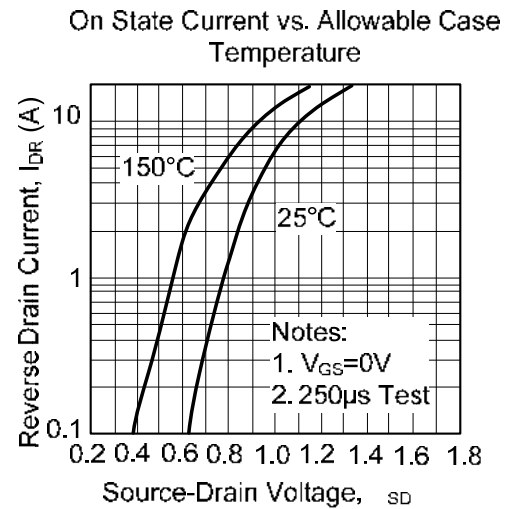
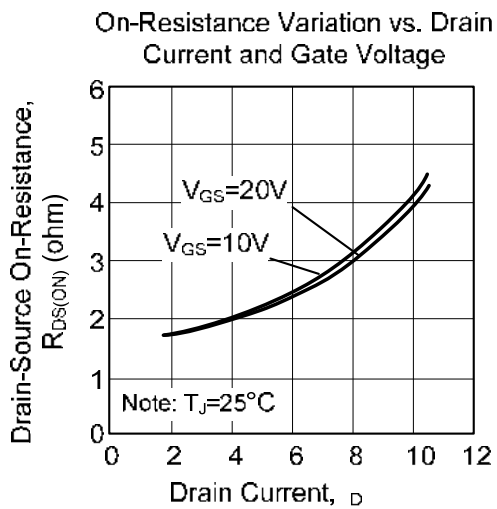
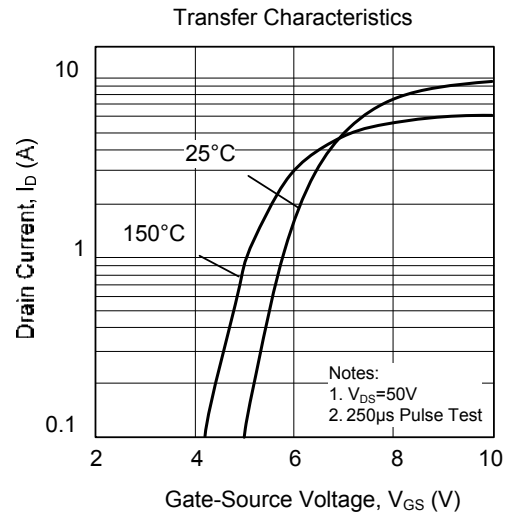
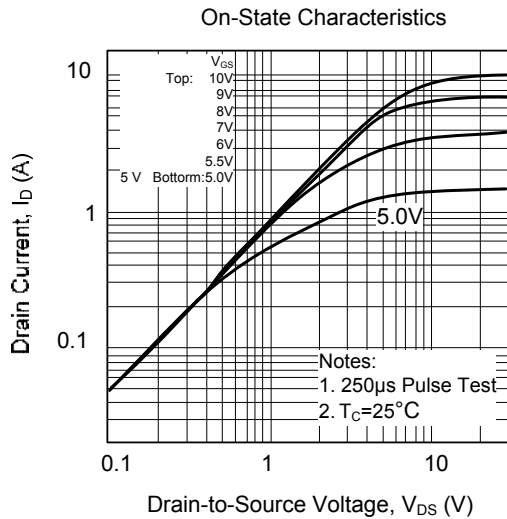
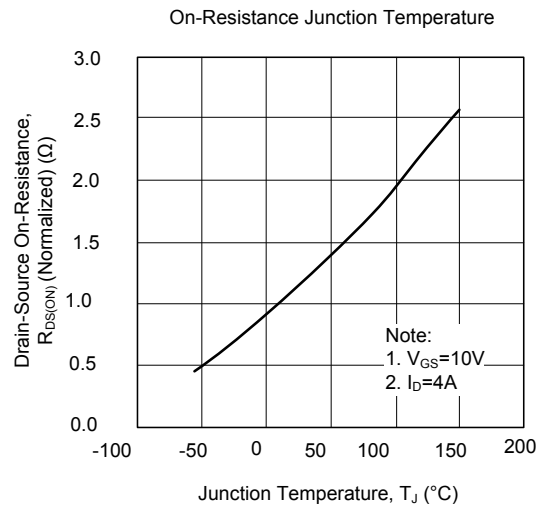
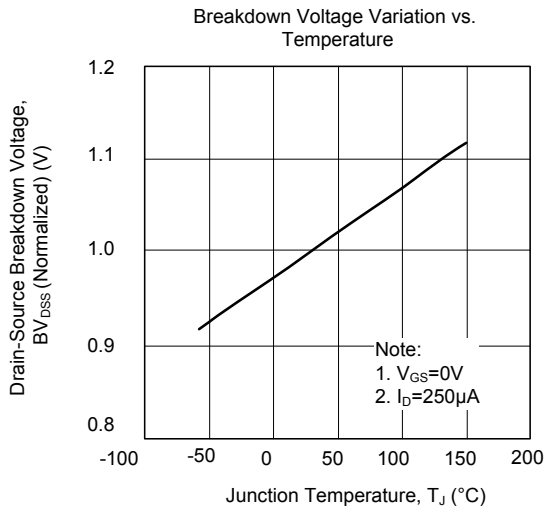
■ ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, unless otherwise noted)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	600			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS} = 600\text{ V}, V_{GS} = 0\text{ V}$			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$			100	nA
	Reverse		$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$			-100	nA
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	$I_D = 250\text{ }\mu\text{A}$, Referenced to 25°C		0.6		V/°C
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 2.0\text{A}$		2.4	2.8	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{MHz}$		520	670	pF
Output Capacitance		C_{OSS}			70	90	pF
Reverse Transfer Capacitance		C_{RSS}			8	11	pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		$t_{D(ON)}$	$V_{DD} = 300\text{V}, I_D = 4.0\text{A}, R_G = 25\Omega$ (Note 1, 2)		13	35	ns
Turn-On Rise Time		t_R			45	100	ns
Turn-Off Delay Time		$t_{D(OFF)}$			25	60	ns
Turn-Off Fall Time		t_F			35	80	ns
Total Gate Charge		Q_G	$V_{DS} = 480\text{V}, I_D = 4.0\text{A}, V_{GS} = 10\text{ V}$ (Note 1, 2)		15	20	nC
Gate-Source Charge		Q_{GS}			3.4		nC
Gate-Drain Charge		Q_{GD}			7.1		nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage		V_{SD}	$V_{GS} = 0\text{ V}, I_S = 4.0\text{ A}$			1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I_S				4.0	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				16	A
Reverse Recovery Time		t_{RR}	$V_{GS} = 0\text{ V}, I_S = 4.0\text{ A}$		250		ns
Reverse Recovery Charge		Q_{RR}	$dl_F/dt = 100\text{ A}/\mu\text{s}$ (Note 1)		1.5		μC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

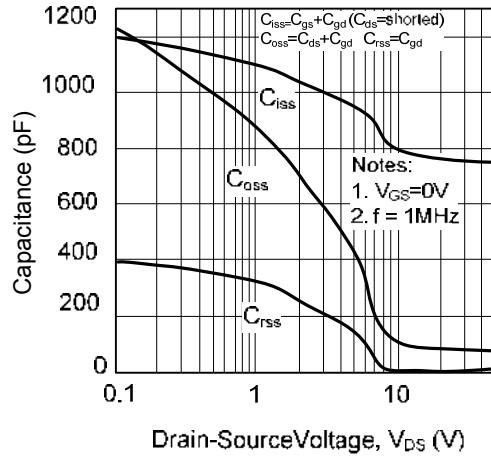
2. Essentially independent of operating temperature

■ TYPICAL CHARACTERISTICS

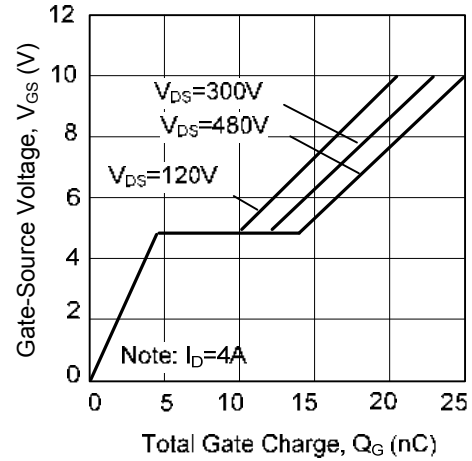


■ TYPICAL CHARACTERISTICS(Cont.)

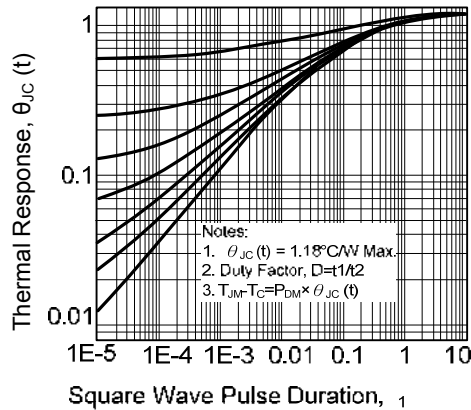
Capacitance Characteristics
(Non-Repetitive)



Gate Charge Characteristics



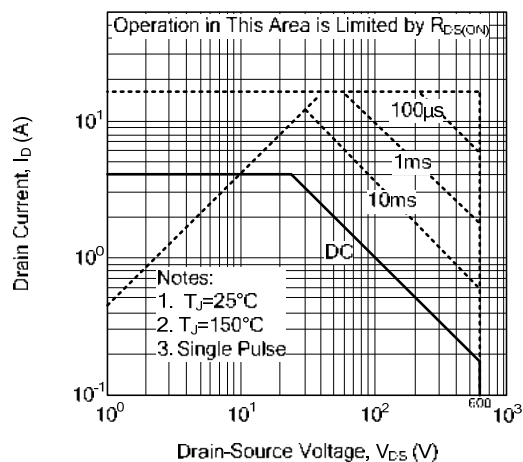
Transient Thermal Response
Curve



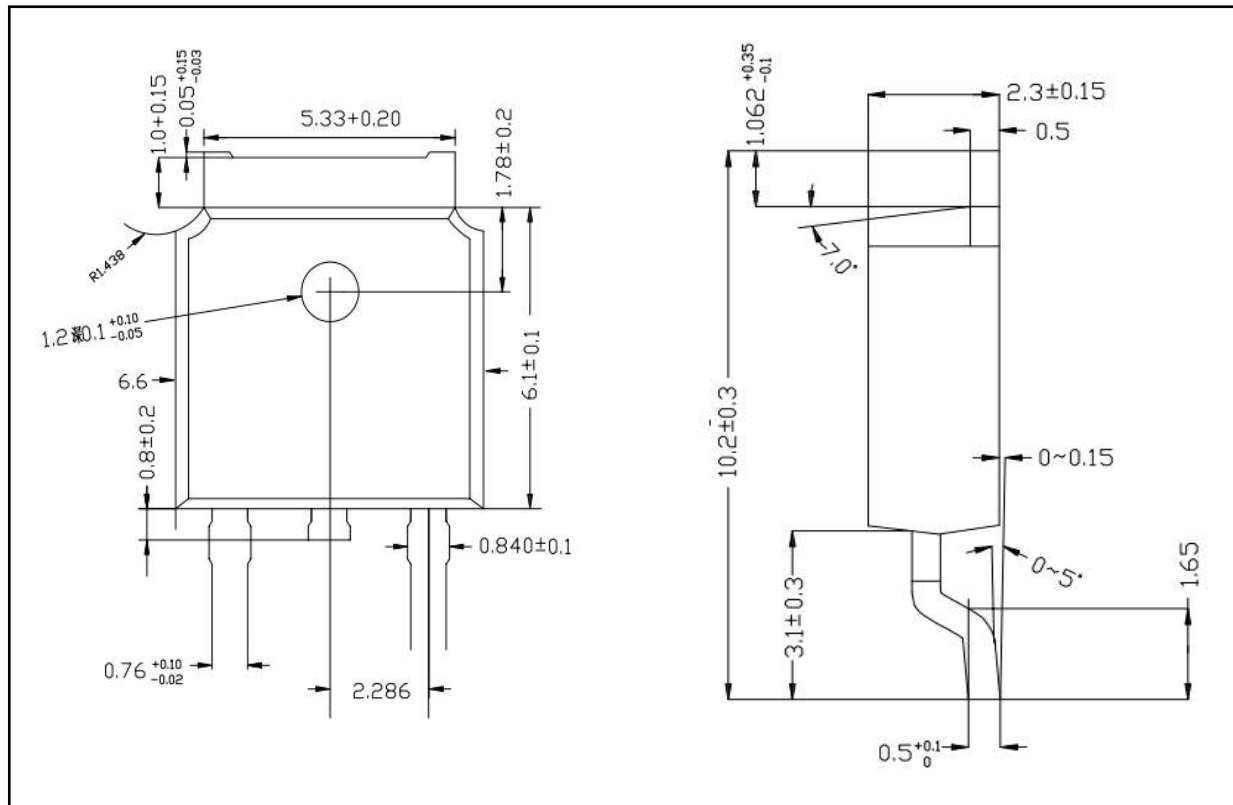
Power Dissipation



Safe Operating Area



■ TO-252-2L PACKAGE OUTLINE DIMENSIONS



■ TO-251-3L PACKAGE OUTLINE DIMENSIONS

