

PRODUCT CHARACTERISTICS

VDSS	30V
$R_{DS(on)Typ}(V_{GS}=10V)$	10mΩ
$R_{DS(on)Typ}(V_{GS}=4.5V)$	15mΩ
ID	20A

FEATURES

- High density cell design for ultra low Rdson
- Fully characterized Avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

APPLICATIONS

- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply

ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT20N03D	TO-252	2500Pieces/Reel
N/A	MOT20N03C	TO-251	70Pieces/Tube

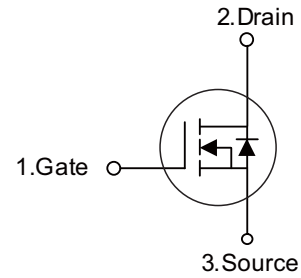
ABSOLUTE MAXIMUM RATINGS (T_C = 25°C, unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	V
Drain Current-Continuous	I _D	20	A
Drain Current-Continuous(T _C =100°C)	I _D (100°C)	14.1	A
Pulsed Drain Current	I _{DM}	80	A
Maximum Power Dissipation	P _D	20	W
Derating factor		0.27	W/°C
Single pulse avalanche energy (Note 5)	E _{AS}	72	mJ
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55 To 150	°C

THERMAL DATA

Thermal Resistance,Junction-to-Case	R _{θJC}	6.25	°C/W
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Symbol



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

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=30V, V_{GS}=0V$	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.7	-	2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	10	15	m Ω
		$V_{GS}=4.5V, I_D=10A$	-	15	20	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=5V, I_D=10A$	26	-	-	S
Dynamic characteristics						
Input Capacitance	C_{iss}	$V_{DS}=15V, V_{GS}=0V,$ $F=1.0MHz$	-	1000	-	PF
Output Capacitance	C_{oss}		-	180.8	-	PF
Reverse Transfer Capacitance	C_{rss}		-	164.4	-	PF
Switching characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=15V, R_L=0.75\Omega$ $V_{GS}=10V, R_G=3\Omega$	-	5	-	nS
Turn-on Rise Time	t_r		-	12	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	19	-	nS
Turn-Off Fall Time	t_f		-	6	-	nS
Total Gate Charge	Q_g	$V_{DS}=15V, I_D=10A,$ $V_{GS}=10V$	-	17		nC
Gate-Source Charge	Q_{gs}		-	2.8		nC
Gate-Drain Charge	Q_{gd}		-	3.9		nC
Drain-source diode characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=10A$	-		1.2	V
Diode Forward Current	I_S		-	-	20	A
Reverse Recovery Time	t_{rr}	$T_J = 25^{\circ}C, I_F = 10A$ $di/dt = 100A/\mu s^{(Note3)}$	-	19	-	nS
Reverse Recovery Charge	Q_{rr}		-	10	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

■ TYPICAL CHARACTERISTICS

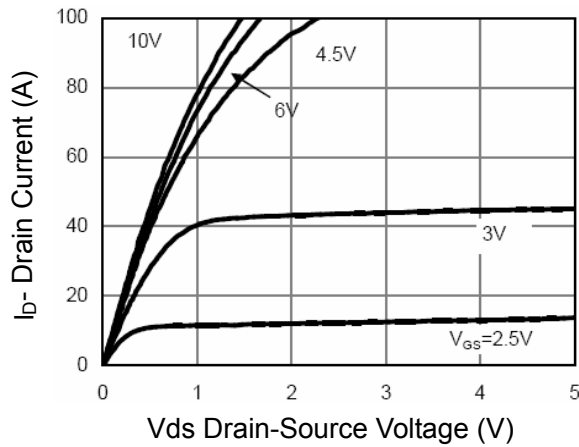


Figure 1 Output Characteristics

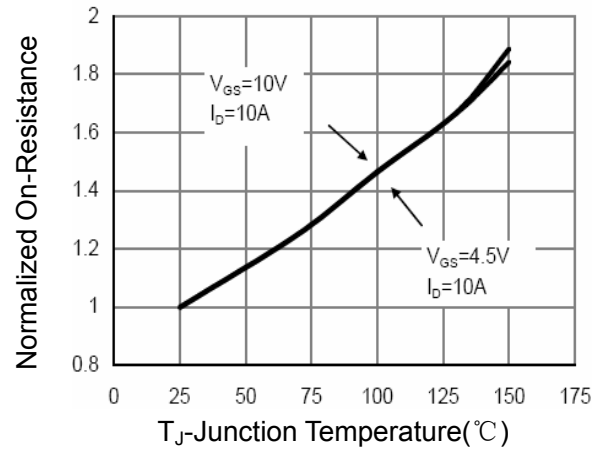


Figure 2 $R_{DS(on)}$ -Junction Temperature

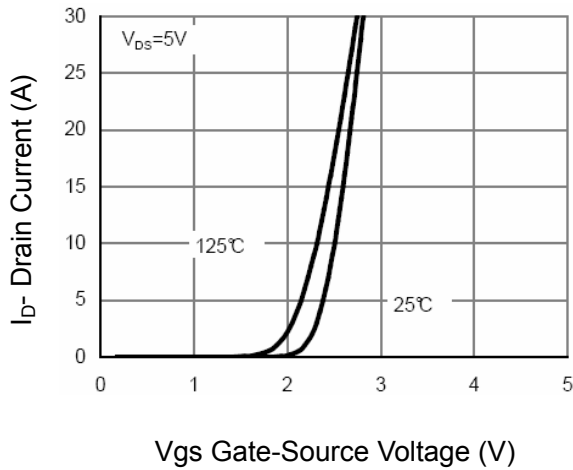


Figure 3 Transfer Characteristics

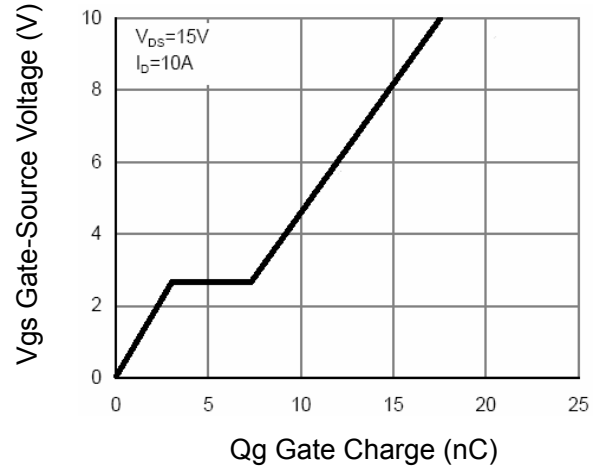


Figure 4 Gate Charge

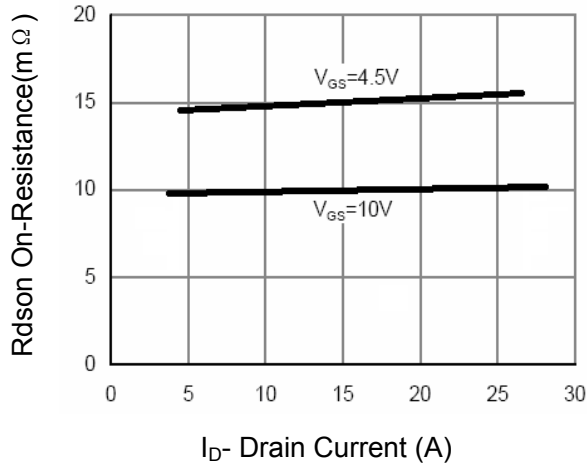


Figure 5 $R_{DS(on)}$ - Drain Current

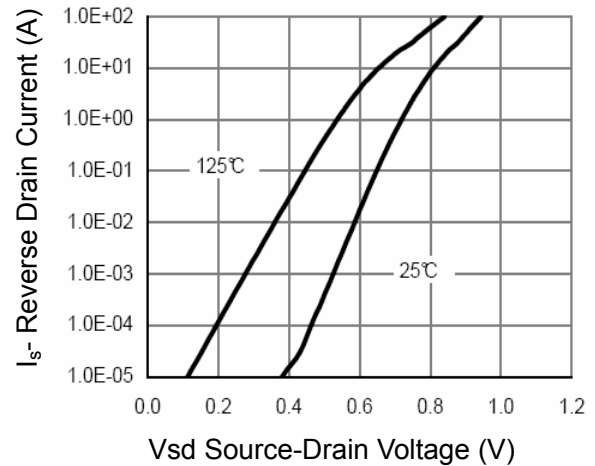


Figure 6 Source- Drain Diode Forward

■ TYPICAL CHARACTERISTICS(Cont.)

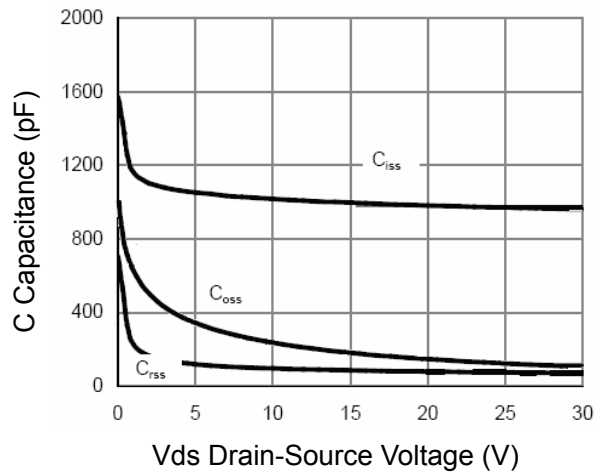


Figure 7 Capacitance vs Vds

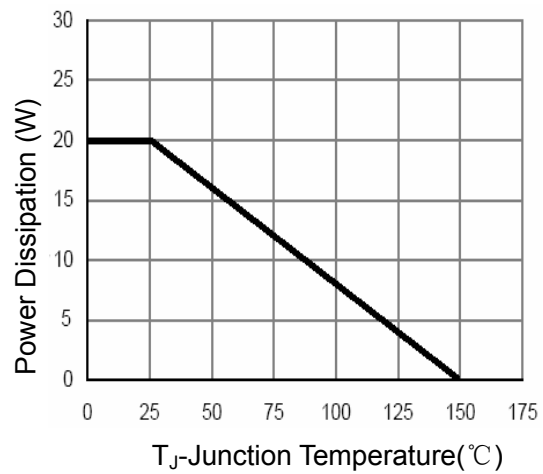


Figure 8 Power De-rating

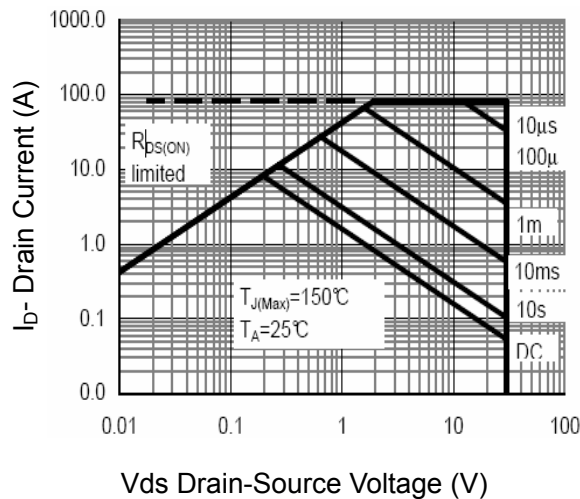


Figure 9 Safe Operation Area

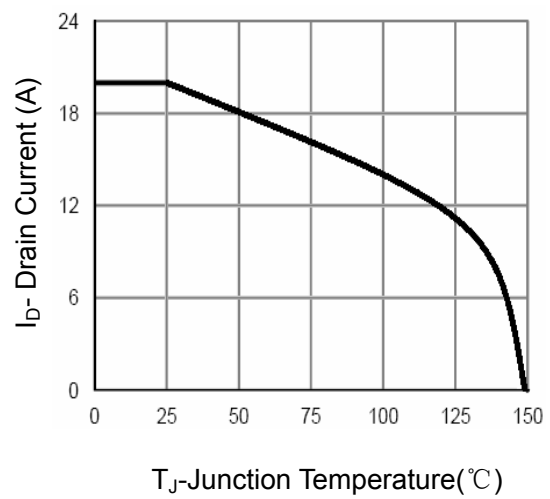


Figure 10 I_D Current De-rating

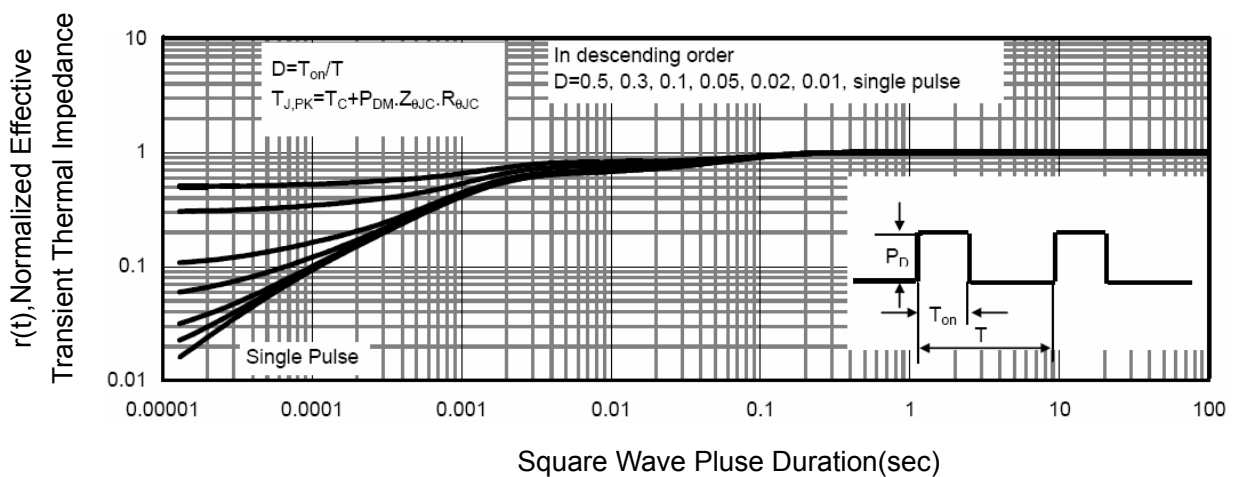
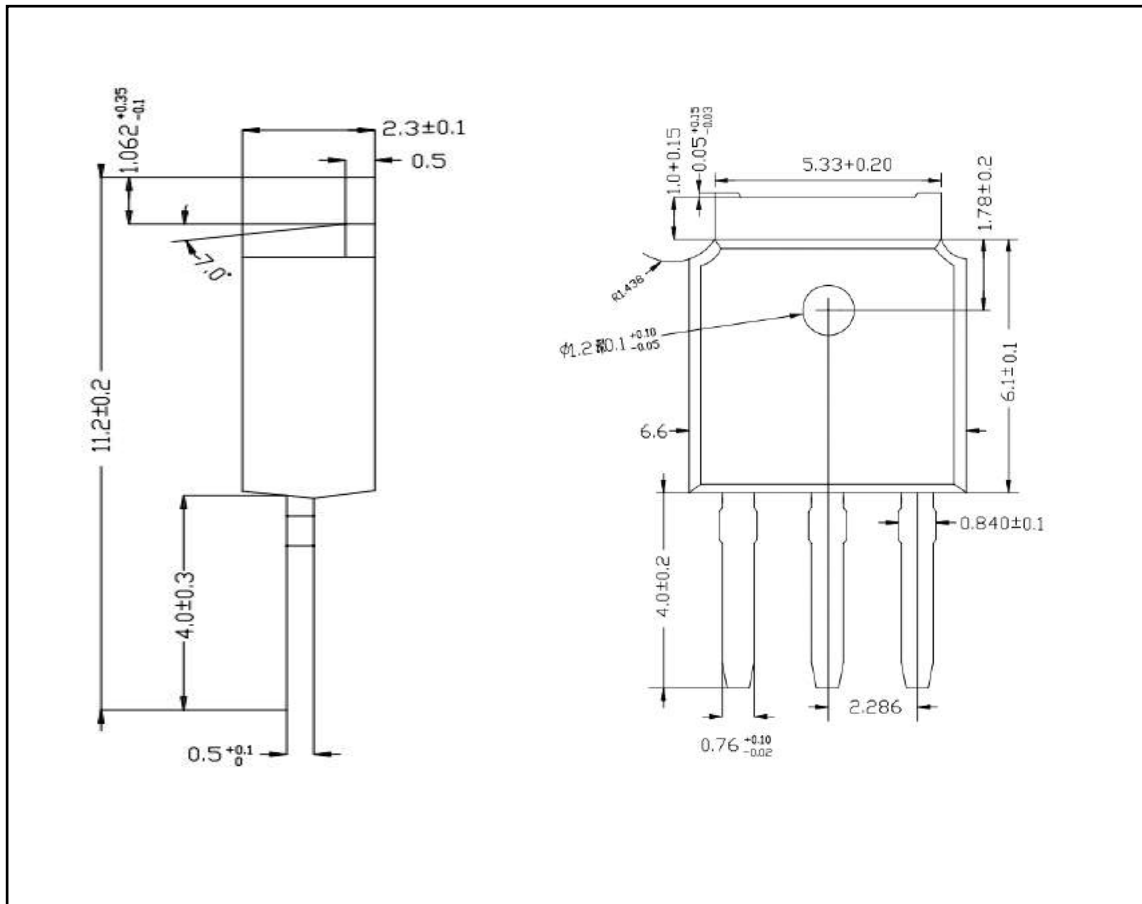


Figure 11 Normalized Maximum Transient Thermal Impedance

■ TO-251 PACKAGE OUTLINE DIMENSIONS



■ TO-252 PACKAGE OUTLINE DIMENSIONS

