

■ PRODUCT CHARACTERISTICS

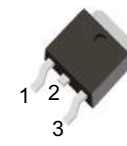
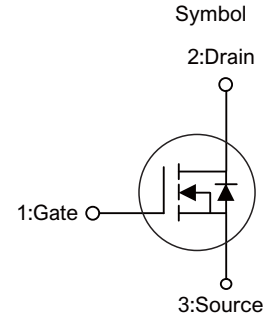
V _{DSS}	20V
R _{DS(ON)Typ} (@V _{GS} =2.5V)	6mΩ
R _{DS(ON)Typ} (@V _{GS} =4.5V)	4mΩ
I _D	90A

■ APPLICATIONS

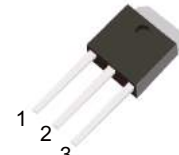
Power management in telecom., industrial automation, CE
Current switching in DC/DC-AC/DC sub-systems
Motor driving in power tool
E-vehicle, robotics

■ FEATURES

- *Low gate charge
- *UIS tested, 100% R_g tested
- *Pb-free lead plating
- *Halogen-free and RoHS-compliant



TO-252



TO-251

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT90N02D	TO-252	2500 pieces/Reel
N/A	MOT90N02C	TO-251	70 pieces/Tube

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

Parameter	Symbol	Ratings	Unit	
Drain-to-source voltage	V _{DSS}	20	V	
Gate-to-source voltage	V _{GSS}	±12	V	
Continuous drain	T _C =25°C	I _D	90	A
	T _C =100°C	I _D	63.6	A
Pulsed drain current	I _{DM}	360	A	
Avalanche energy	E _{AS}	280	mJ	
Power dissipation	P _D	83	W	
Junction & storage temperature range	T _J , T _{STG}	~55 to +150	°C	

■ THERMAL PERFORMANCE

Parameter	Symbol	Ratings	Unit
Thermal resistance, Junction-to-case	R _{θJC}	1.8	°C/W

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
STATIC PARAMETERS						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$ $T_J=55^\circ\text{C}$	-	-	1	μA
			-	-	5	μA
Gate-body leakage current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	0.5	-	11	V
Static drain-source on-resistance	$V_{GS(th)}$	$V_{GS}=4.5V, I_D=20A$	-	4	5.5	m Ω
		$V_{GS}=2.5V, I_D=15A$	-	6	7.5	m Ω
Forward transconductance	g_{FS}	$V_{DS}=5V, I_D=5A$	-	-	50	S
Diode forward voltage	V_{SD}	$I_S=1A, V_{GS}=0V$	-	0.75	1	V
Diode continuous current	I_S	$T_C=25^\circ\text{C}$	-	-	90	A
DYNAMIC PARAMETERS						
Input capacitance	C_{ISS}	$V_{GS}=0V, V_{DS}=10V, f=1\text{MHz}$	-	2016	-	pF
Output capacitance	C_{OSS}		-	391	-	pF
Reverse transfer capacitance	C_{rSS}		-	130	-	pF
Gate resistance	R_g	$V_{GS}=0V, V_{DS}=0V, f=1\text{MHz}$	-	1.4	-	Ω
SWITCHING PARAMETERS						
Total charge	Q_g	$V_{GS}=4.5V$ $V_{DS}=10V, I_D=20A$	-	15	-	nC
Gate source charge	Q_{gs}		-	3	-	nC
Gate drain charge	Q_{gd}		-	4	-	nC
Turn-on delay time	$t_{D(on)}$	$V_{GS}=10V, V_{DD}=10V$ $I_D=20A, R_{GEN}=2.7\Omega$	-	6	-	nS
Turn-on rise time	t_r		-	4	-	nS
Turn-off delay time	$t_{D(off)}$		-	31	-	nS
Turn-off fall time	t_f		-	5	-	nS
Body-diode reverse recovery time	t_{rr}	$I_F=20A, dI_F/dt=100A/\mu s$	-	18	-	nS
Body-diode reverse recovery charge	Q_{rr}	$I_F=20A, dI_F/dt=100A/\mu s$	-	30	-	nC

■ TYPICAL CHARACTERISTICS

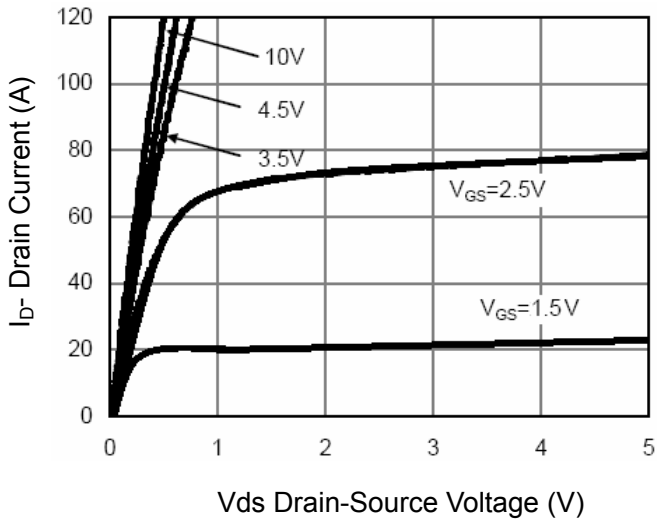


Figure 1 Output Characteristics

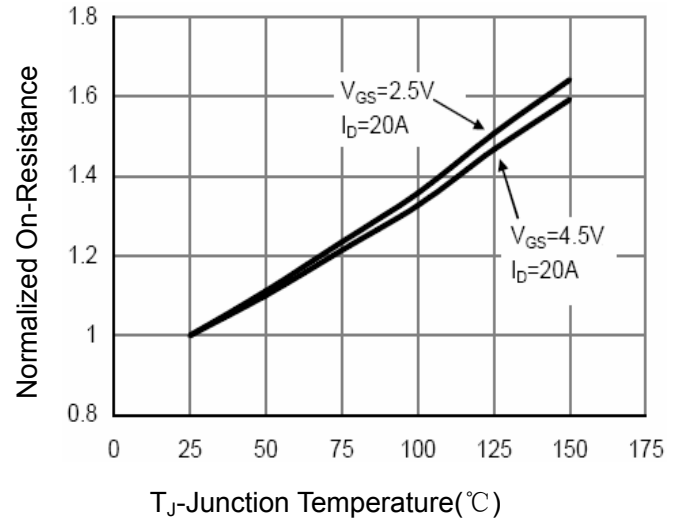


Figure 2 Rdson-Junction Temperature

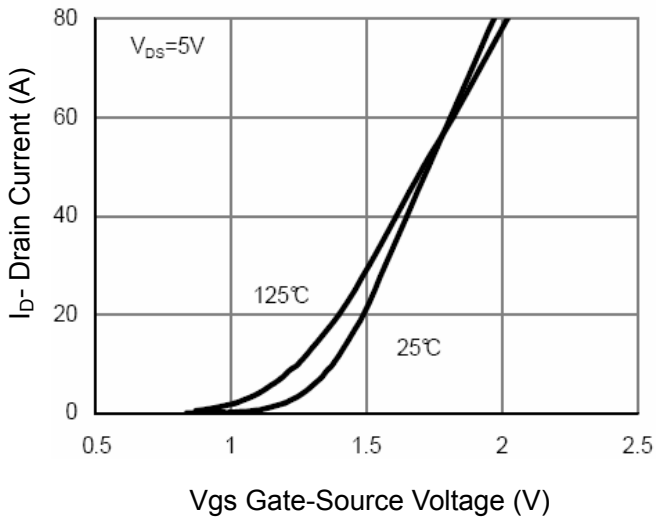


Figure 3 Transfer Characteristics

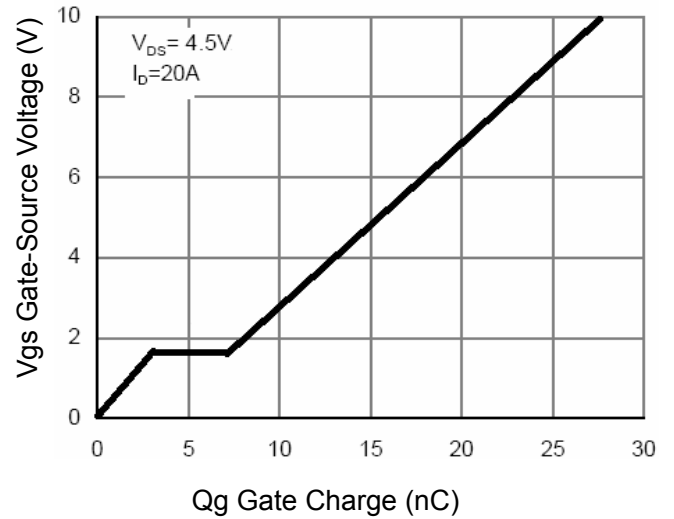


Figure 4 Gate Charge

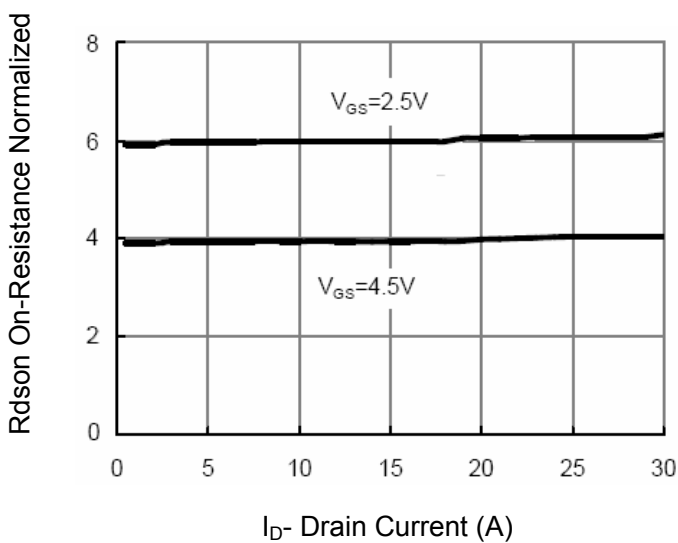


Figure 5 Rdson- Drain Current

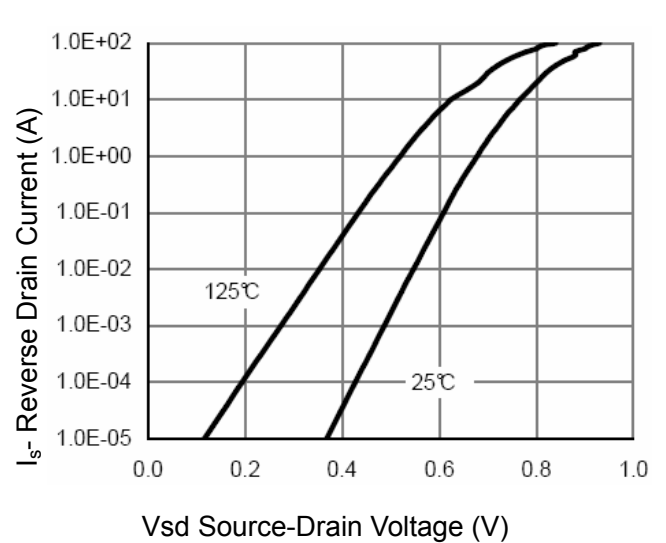


Figure 6 Source- Drain Diode Forward

■ TYPICAL CHARACTERISTICS(Cont.)

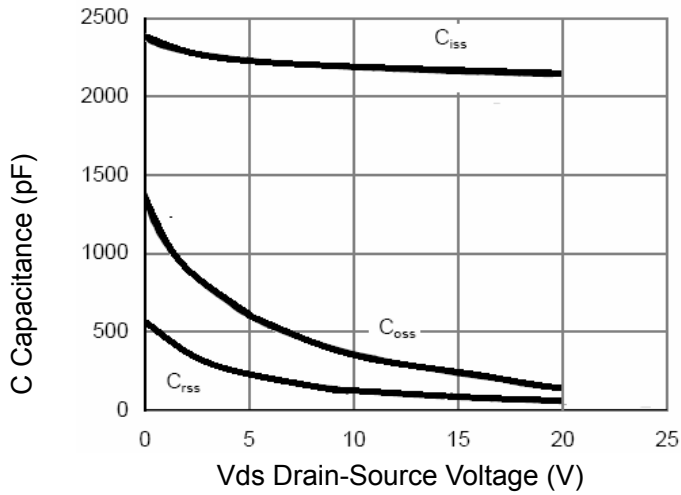


Figure 7 Capacitance vs Vds

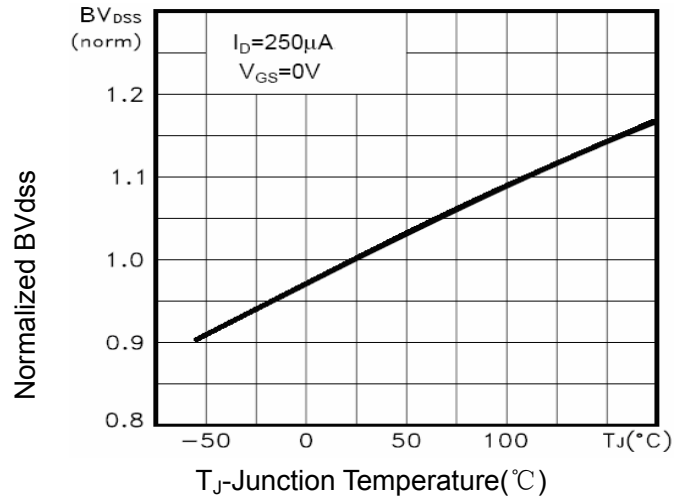


Figure 8 BV_{DSS} vs Junction Temperature

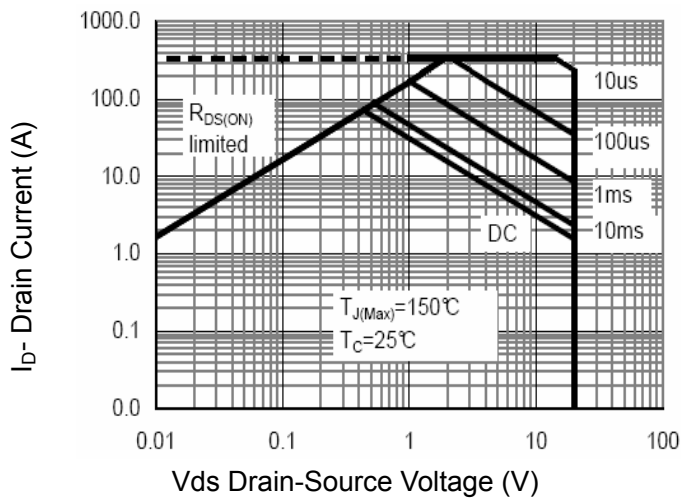


Figure 9 Safe Operation Area

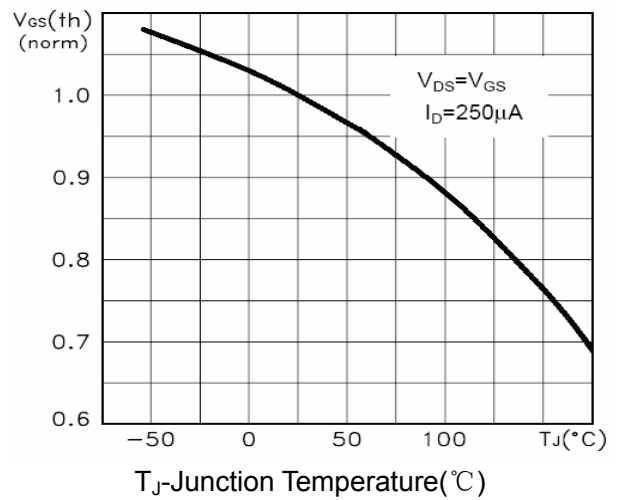


Figure 10 V_{GS(th)} vs Junction Temperature

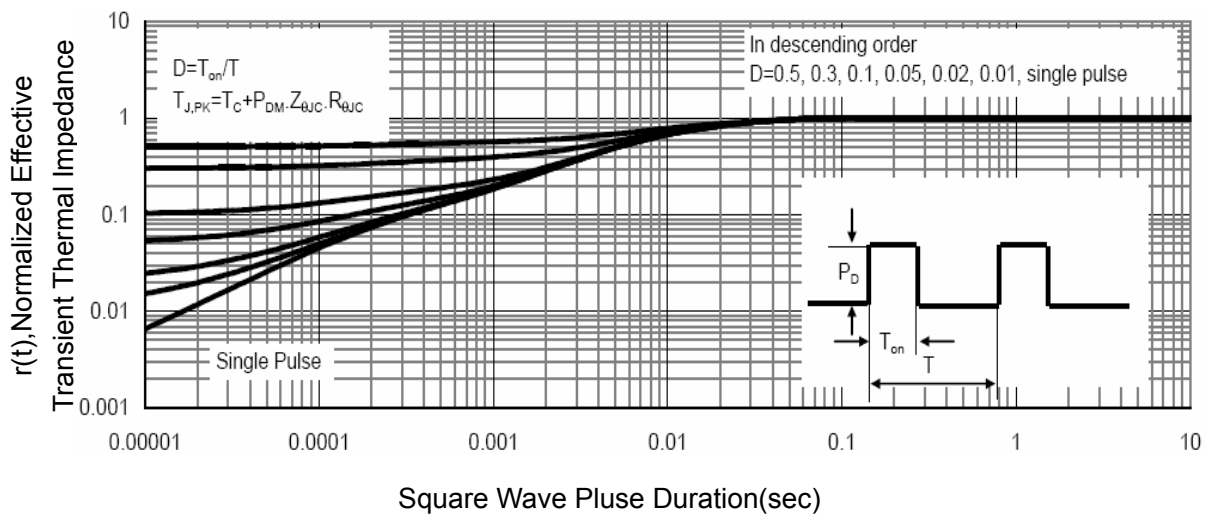
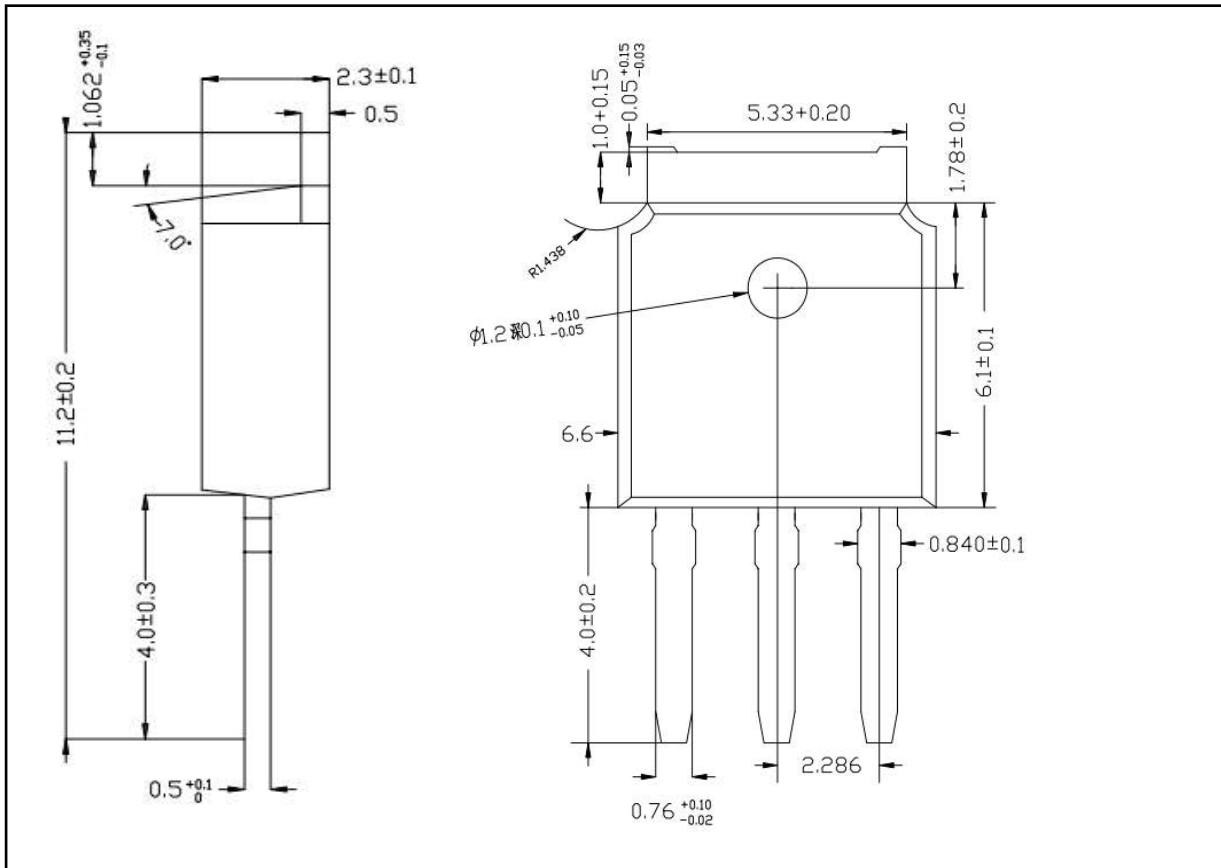


Figure 11 Normalized Maximum Transient Thermal Impedance

■ TO-251 PACKAGE OUTLINE DIMENSIONS



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