

■ PRODUCT CHARACTERISTICS

VDSS	-20V
$R_{DS(on)}$ Typ(@ $V_{GS}=-4.5V$)	13m Ω
$R_{DS(on)}$ Typ(@ $V_{GS}=-2.5V$)	16.5m Ω
ID	-50A

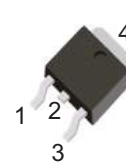
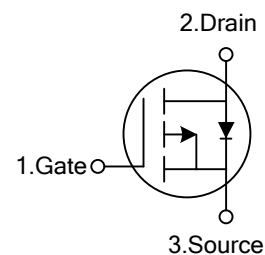
■ APPLICATIONS

- * Power switch
- * DC/DC converters

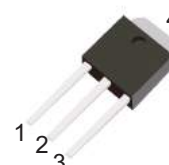
■ FEATURES

- * $V_{DS}=-20V, I_D=-50A$
- * Super high dense cell design
- * Advanced trench process technology
- * Reliable and rugged
- * High density cell design for ultra low on-resistance

Symbol



TO-252



TO-251

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT50P02D	TO-252	2500 pieces /Reel
N/A	MOT50P02C	TO-251	70 pieces/Tube

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

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Drain Current-Continuous	I_D	-50	A
Pulsed Drain Current	I_{DM}	-150	A
Thermal Resistance,Junction-to-Ambient	θ_{JC}	42	$^{\circ}C/W$
Maximum Power Dissipation	P_D	3.0	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^{\circ}C$

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

Parameter	Symbol	Conditon	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-20	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$	-	-	± 100	nA
On characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.6	-0.8	-1.4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-6.5A$	-	13	18	m Ω
		$V_{GS}=-2.5V, I_D=-5A$	-	16.5	23	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=3A$	-	10	-	S
Dynamic characteristics						
Input Capacitance	C_{ISS}	$V_{DS}=-10V, V_{GS}=0V,$ $F=1.0MHz$	-	2100	-	PF
Output Capacitance	C_{OSS}		-	450	-	PF
Reverse Transfer Capacitance	C_{RSS}		-	300	-	PF
Switching characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-10V, I_D=-1A,$ $V_{GS}=-4.5V, R_{GEN}=6\Omega$	-	25	-	nS
Turn-on Rise Time	t_r		-	30	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	70	-	nS
Turn-Off Fall Time	t_f		-	50	-	nS
Total Gate Charge	Q_g	$V_{DS}=-10V, I_D=-6.5A, V_{GS}=-4.5V$	-	17	-	nC
Gate-Source Charge	Q_{gs}		-	4.1	-	nC
Gate-Drain Charge	Q_{gd}		-	4.3	-	nC
Drain-source diode characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-50A$	-	-	-1.2	V

■ TYPICAL CHARACTERISTICS

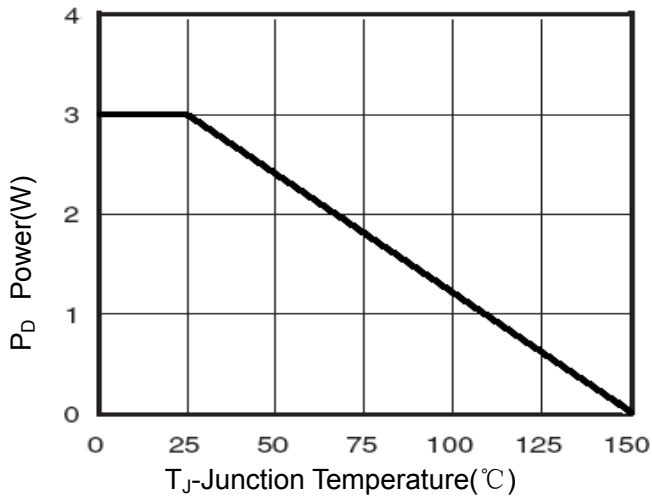


Figure 1 Power Dissipation

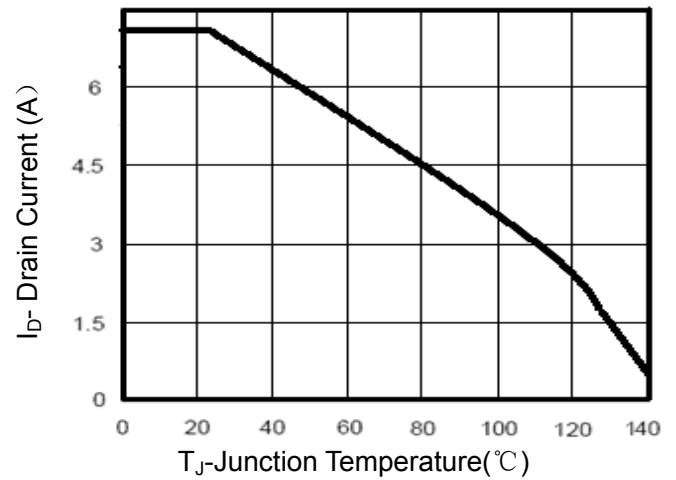


Figure 2 Drain Current

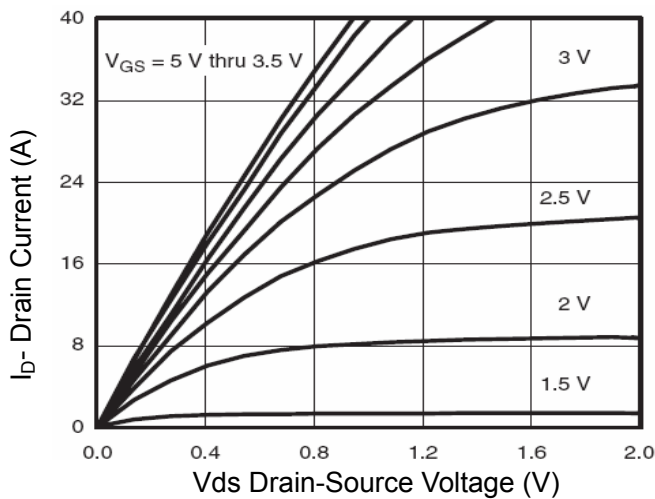


Figure 3 Output Characteristics

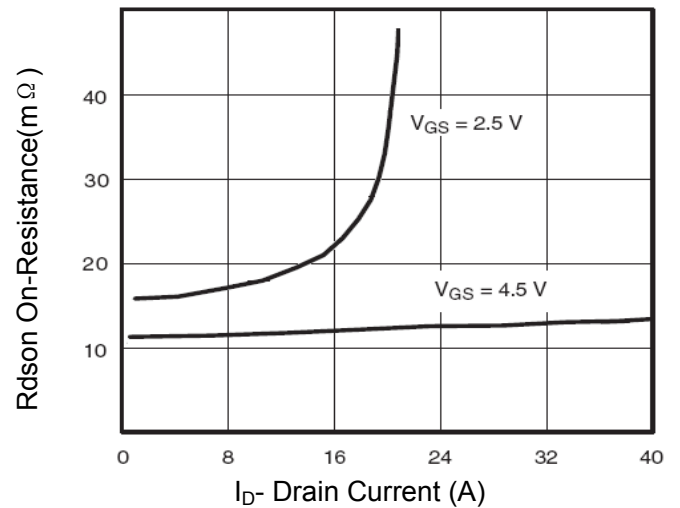


Figure 4 Drain-Source On-Resistance

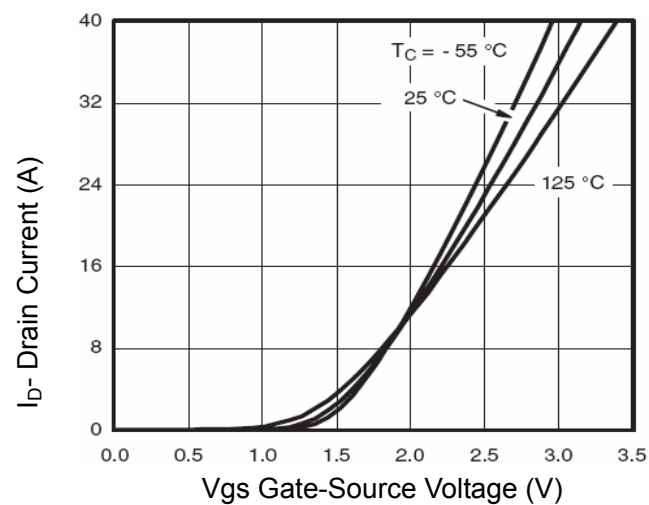


Figure 5 Transfer Characteristics

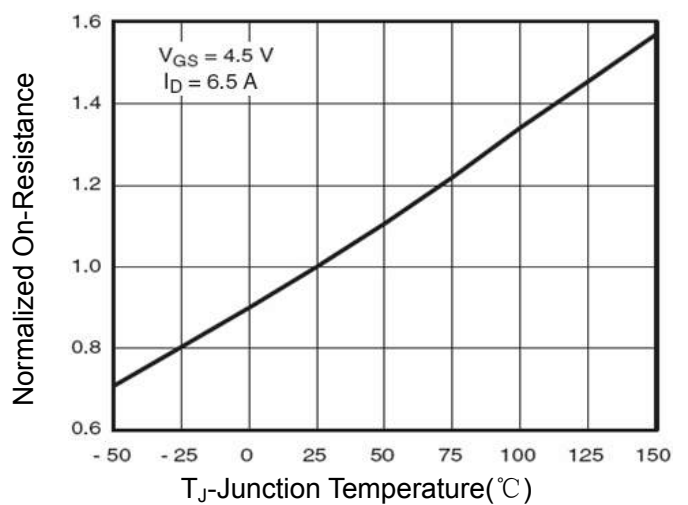


Figure 6 Drain-Source On-Resistance

■ TYPICAL CHARACTERISTICS(Cont.)

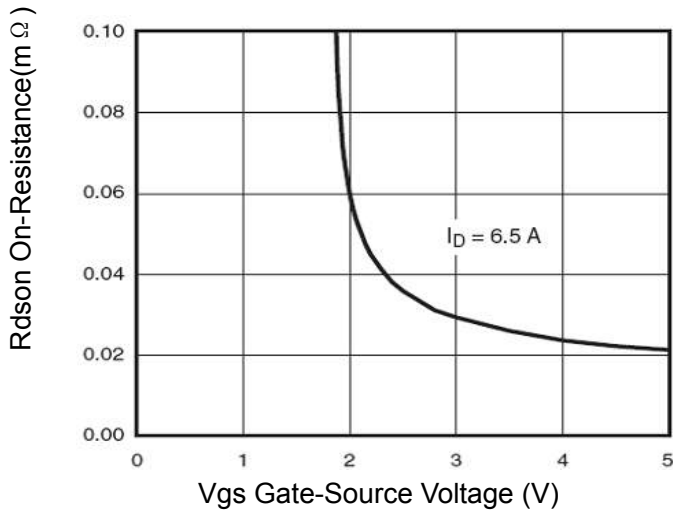


Figure 7 Rdson vs Vgs

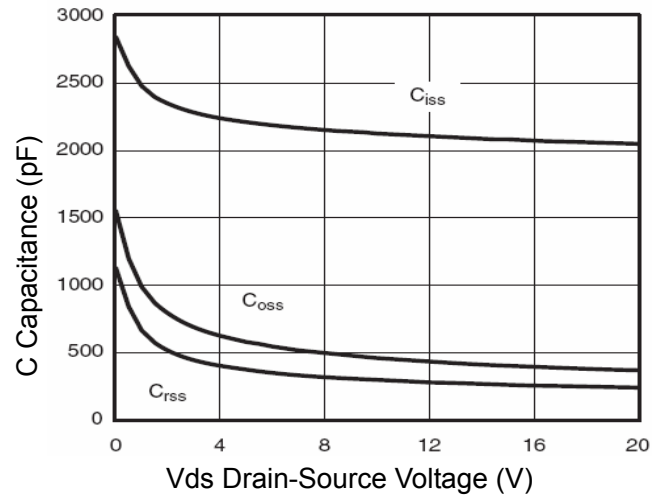


Figure 8 Capacitance vs Vds

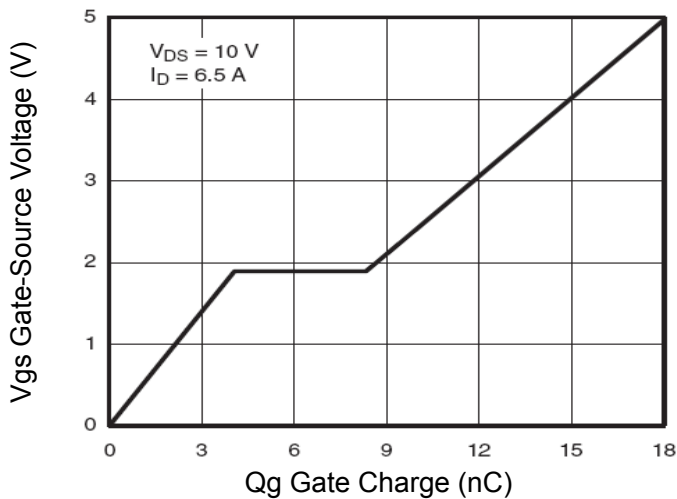


Figure 9 Gate Charge

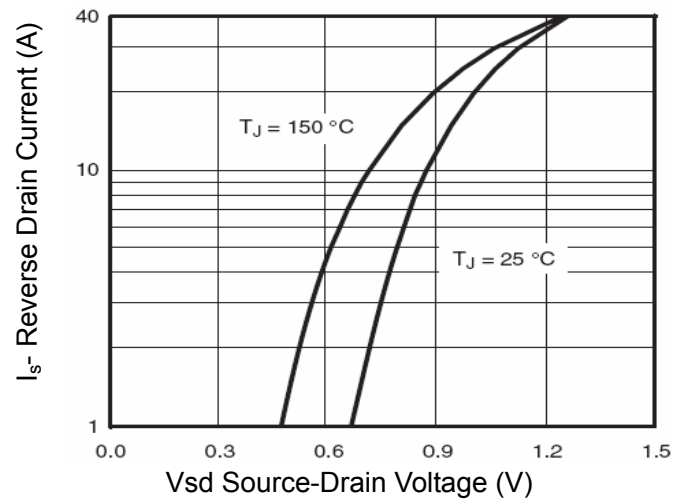


Figure 10 Source- Drain Diode Forward

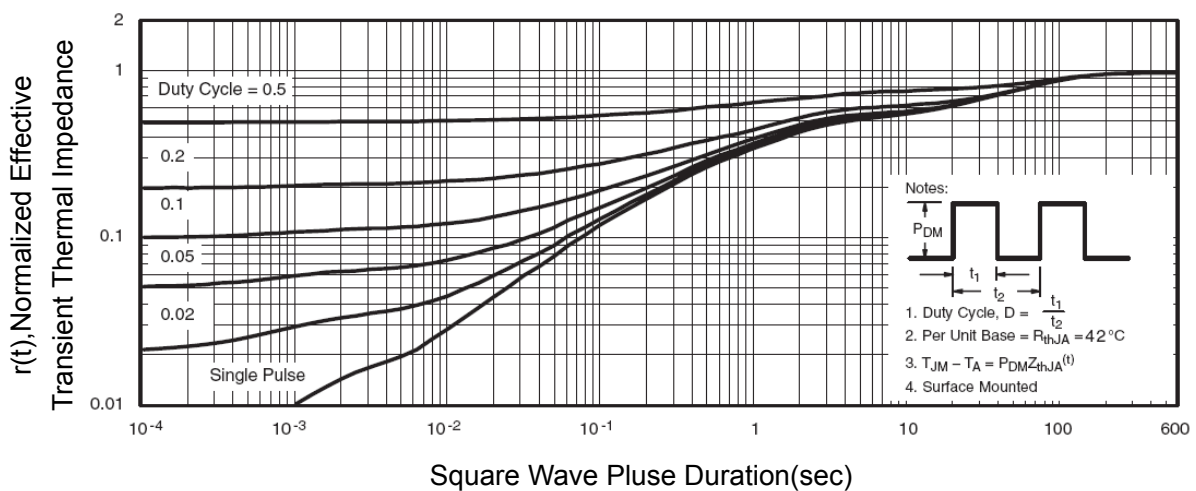
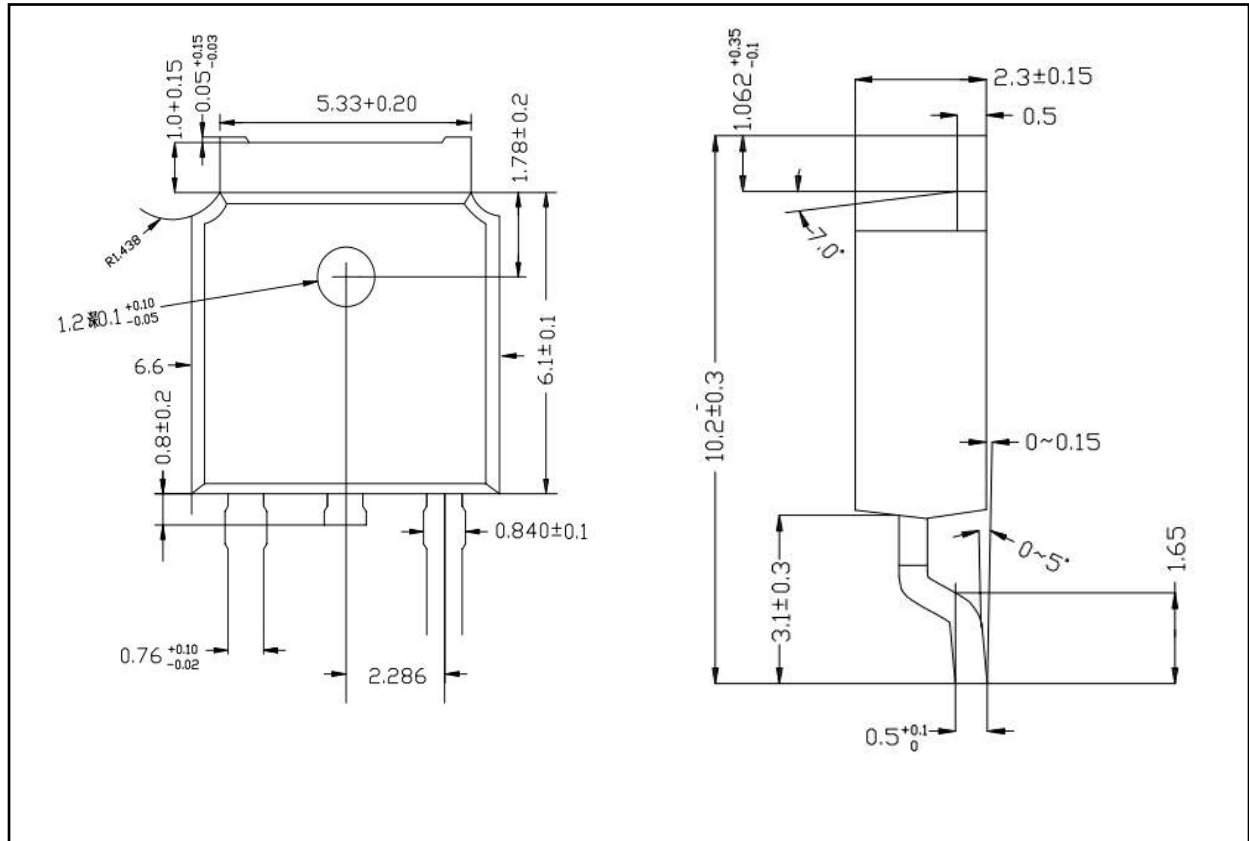


Figure 11 Normalized Maximum Transient Thermal Impedance

■ TO-252-2L PACKAGE OUTLINE DIMENSIONS



■ TO-251PACKAGE OUTLINE DIMENSIONS

