

■ PRODUCT CHARACTERISTICS

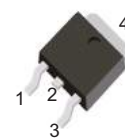
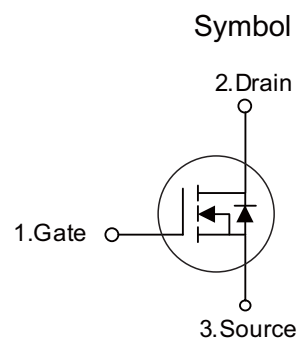
V_{DS}	30V
$R_{DS(ON)Typ} (@ V_{GS}=4.5V)$	5.5m Ω
$R_{DS(ON)Typ} (@ V_{GS}=10V)$	3.5m Ω
I_D	90A

■ FEATURES

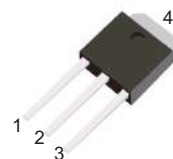
- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

■ APPLICATIONS

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



TO-252



TO-251

■ ORDER INFORMATION

Order codes		Package	Packing
Halogen- Free	Halogen		
N/A	MOT110N03D	TO-252	2500pieces/Reel
N/A	MOT110N03C	TO-251	70pieces/Tube

■ ABSOLUTE MAXIMUM RATINGS ($T_C = 25^{\circ}C$, 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	110	A
Drain Current-Continuous($T_C=100^{\circ}C$)	$I_D (100^{\circ}C)$	77.8	A
Pulsed Drain Current	I_{DM}	440	A
Maximum Power Dissipation	P_D	120	W
Single pulse avalanche energy (Note 5)	E_{AS}	350	mJ
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 175	$^{\circ}C$

■ THERMAL CHARACTERISTICS

Thermal Resistance,Junction-to-Case(Note 2)	$R_{\theta JC}$	1.25	$^{\circ}C/W$
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■ ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	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} =±20V, V _{DS} =0V	-	-	±100	nA
On characteristics Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1	1.8	2.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =20A	-	3.5	5	mΩ
		V _{GS} =4.5V, I _D =20A	-	5.5	7	
Forward Transconductance	g _{FS}	V _{DS} =10V, I _D =20A	50	-	-	S
Dynamic characteristics (Note4)						
Input Capacitance	C _{iss}	V _{DS} =15V, V _{GS} =0V, F=1.0MHz	-	2987	-	PF
Output Capacitance	C _{OSS}		-	429	-	PF
Reverse Transfer Capacitance	C _{rSS}		-	368	-	PF
Switching characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =15V, I _D =20A V _{GS} =4.5V, R _{GEN} =1.8Ω	-	11	-	nS
Turn-on Rise Time	t _r		-	16	-	nS
Turn-Off Delay Time	t _{d(off)}		-	25	-	nS
Turn-Off Fall Time	t _f		-	60	-	nS
Total Gate Charge	Q _g	V _{DS} =15V, I _D =20A, V _{GS} =10V	-	70	-	nC
Gate-Source Charge	Q _{gs}		-	8.8	-	nC
Gate-Drain Charge	Q _{gd}		-	16.3	-	nC
Drain-source diode characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =20A	-	-	1.2	V
Diode Forward Current (Note 2)	I _S	-	-	-	110	A
Reverse Recovery Time	t _{rr}	TJ = 25°C, IF = 20A	-	29	-	nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs ^(Note3)	-	32	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production
5. EAS condition: $T_J=25^{\circ}\text{C}, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25\Omega$

■ TYPICAL PERFORMANCE CHARACTERISTICS

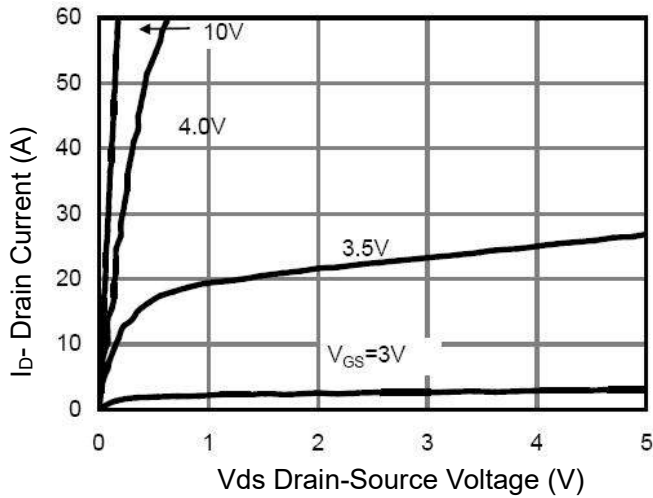


Figure 1 Output Characteristics

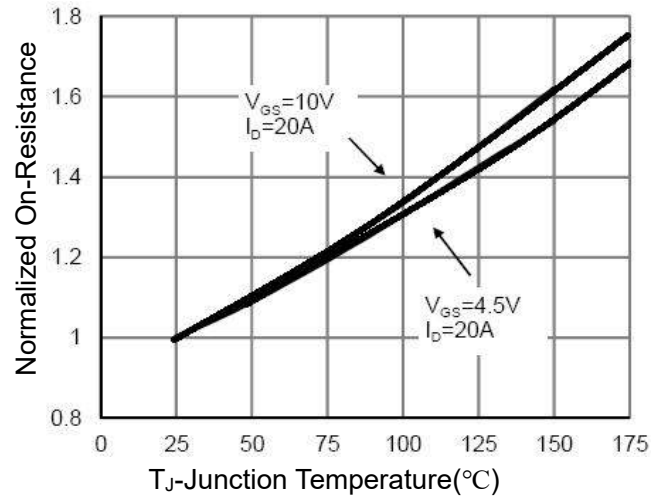


Figure 2 Rdson-Junction Temperature

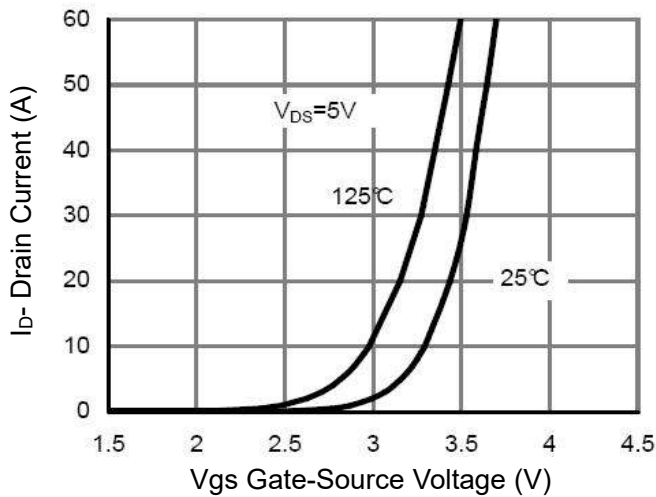


Figure 3 Transfer Characteristics

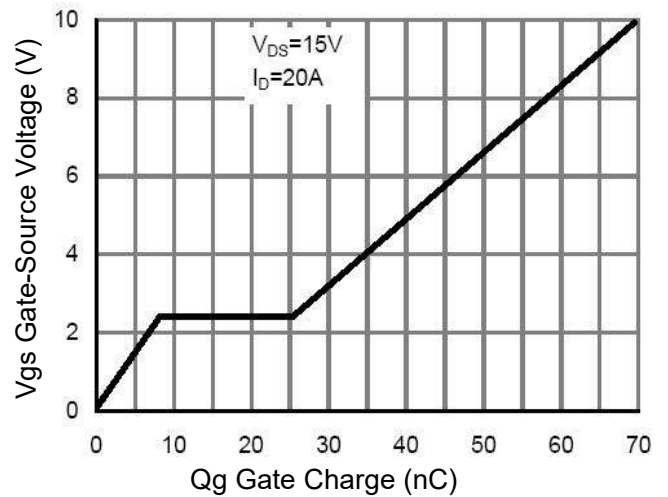


Figure 4 Gate Charge

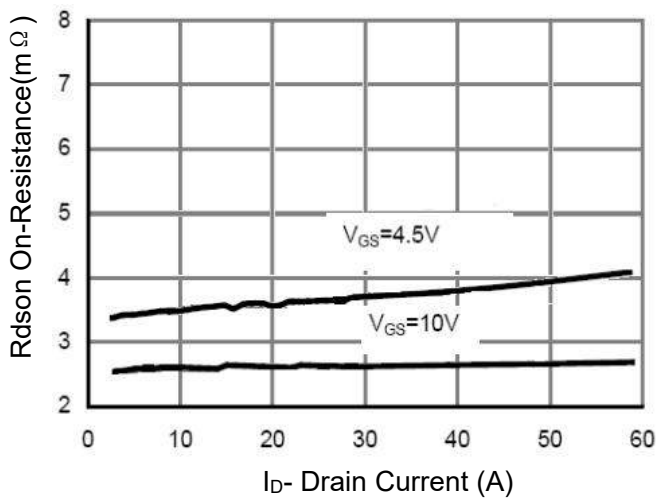


Figure 5 Rdson- Drain Current

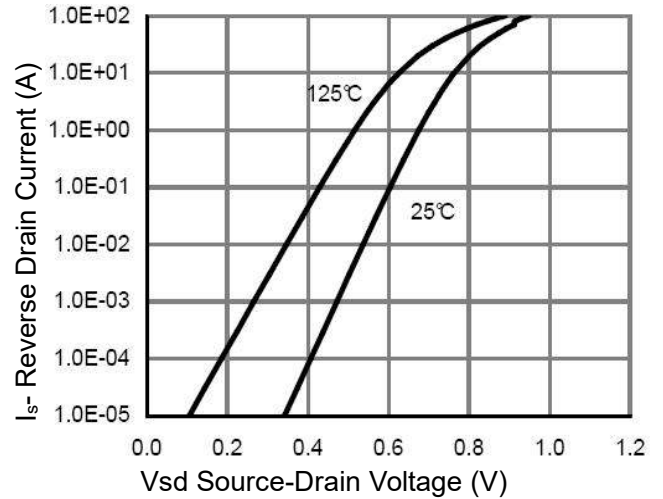


Figure 6 Source- Drain Diode Forward

■ TYPICAL PERFORMANCE CHARACTERISTICS(Cont.)

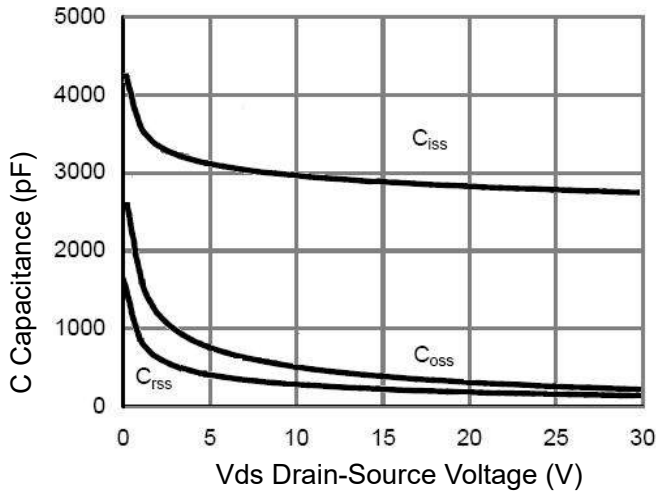


Figure 7 Capacitance vs Vds

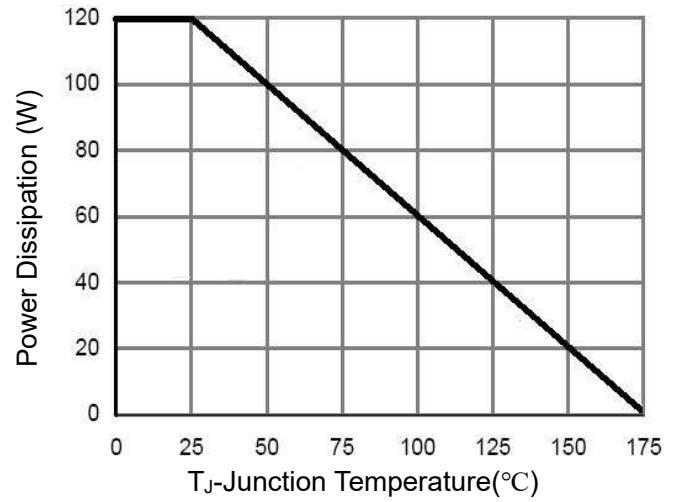


Figure 9 Power De-rating

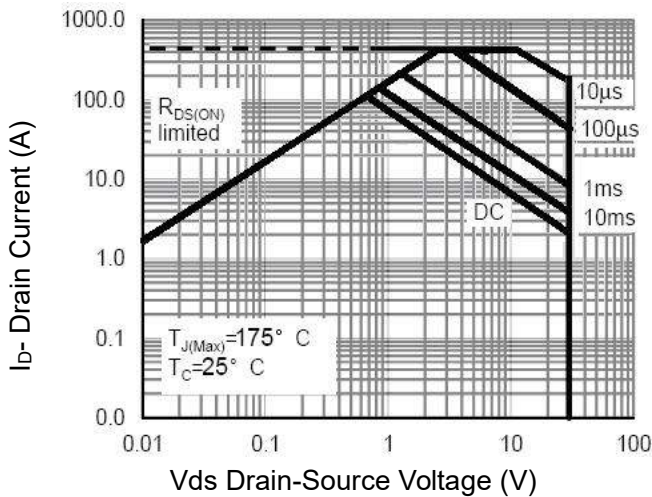


Figure 8 Safe Operation Area

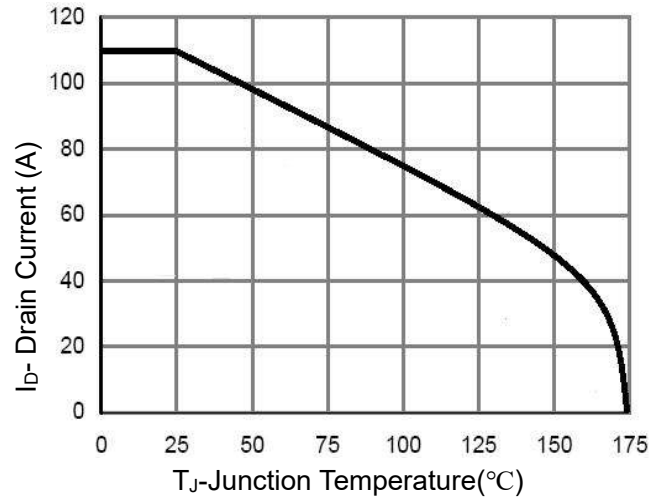


Figure 10 Current De-rating

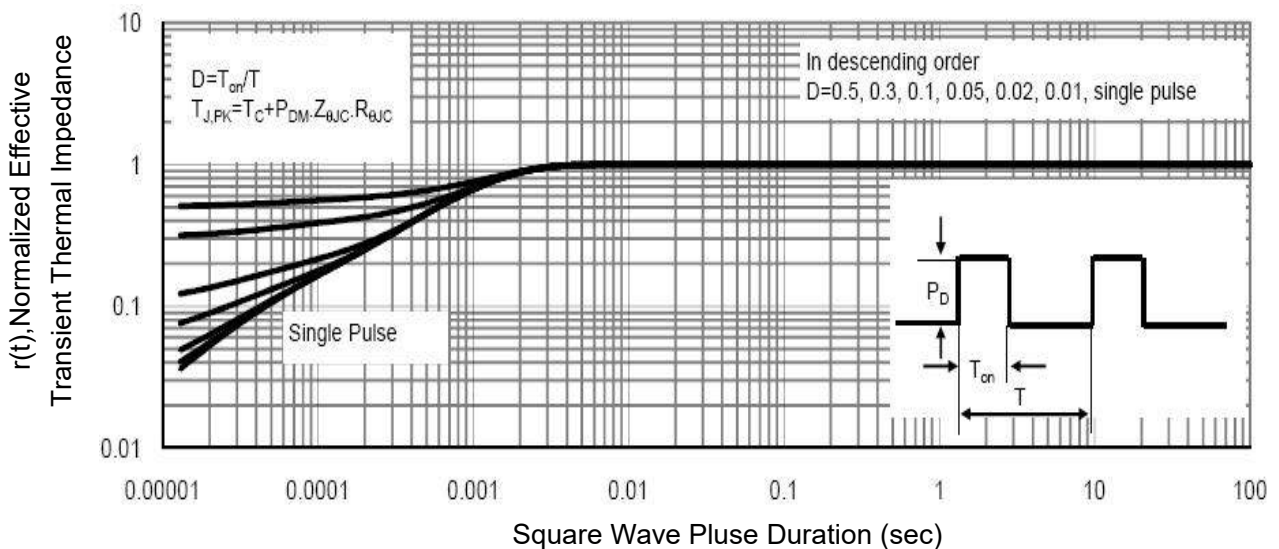


Figure 11 Normalized Maximum Transient Thermal Impedance

Technical drawing of a mechanical part showing two views: a front view (left) and a side view (right).

Front View (Left):

- Overall width: 1.2 ± 0.1
- Top left corner radius: $R1.438$
- Top left vertical dimension: 1.0 ± 0.15
- Top horizontal dimension: 5.33 ± 0.20
- Top right vertical dimension: 1.78 ± 0.2
- Right vertical dimension: 6.1 ± 0.1
- Bottom right vertical dimension: 0.84 ± 0.1
- Bottom horizontal dimension: 2.286
- Bottom left vertical dimension: 0.76 ± 0.10
- Central hole diameter: $\varnothing 0.1$
- Internal horizontal dimension: 0.8 ± 0.2

Side View (Right):

- Overall height: 10.2 ± 0.3
- Top horizontal dimension: 2.3 ± 0.15
- Top right vertical dimension: 0.5
- Top left vertical dimension: 1.062 ± 0.35
- Top left corner radius: $R7.9$
- Internal horizontal dimension: $0 \sim 0.15$
- Internal vertical dimension: $0 \sim 5$
- Bottom right vertical dimension: 1.65
- Bottom left vertical dimension: 3.1 ± 0.3
- Bottom horizontal dimension: 0.5 ± 0.1

■ TO-252 PACKAGE OUTLINE DIMENSIONS

