Descriptions

This 20A, 150V N-Channel MOSFET in a TO-252 Plastic Package.

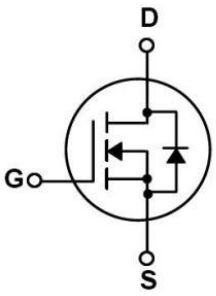
Features

- Low $R_{DS(on)}$
- Low gate charge
- Low C_{iss}
- Fast switching
- Halogen-free Product

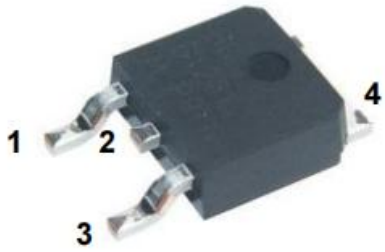
Applications

Suited for low voltage applications such as automotive, DC/DC Converters, high efficiency switching for power management in portable and battery operated products,and power management interface card for TV or Monitor.

Equivalent Circuit



Pinning



PIN1：Gate PIN 2：Drain PIN 3：Source PIN 4：Drain

Absolute Maximum Ratings(Ta=25℃)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DSS}	150	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C=25°C	I_D	20	A
	T_C=100°C		13.5	
Pulsed Drain Current [C]		I_{DM}	35	
Avalanche Current [C]		I_{AS}	14.5	A
Avalanche energy L=0.1mH [C]		E_{AS}	12.5	mJ
Power Dissipation [B]	T_C=25°C	P_D	105	W
	T_C=100°C		41.5	
Junction and Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C
Maximum Junction-to-Ambient [A]	t ≤ 10s	$R_{\theta JA}$	20	℃/W
Maximum Junction-to-Ambient [AD]	Steady-State		50	℃/W
Maximum Junction-to-Case	Steady-State	$R_{\theta Jc}$	1.4	℃/W

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=250μA, V_{GS}=0V	150	156		V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=150V, V_{GS}=0V			1	μA
		T_J=125°C			5	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}，I_D=250μA	2		4	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A		59	90	mΩ
		V_{GS}=7V, I_D=10A		62	110	
Diode Forward Voltage	V_{SD}	I_S=1A,V_{GS}=0V			1	V

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=25V, f=1MHz		1700		pF
Output Capacitance	C_{oss}			4.5		
Reverse Transfer Capacitance	C_{rss}			58		
Gate resistance	R_g	V_{GS}=0V V_{DS}=0V f=1MHz		3.4		Ω
Total Gate Charge	Q_g(10V)	V_{GS}=10V, V_{DS}=75V, I_D=10A		15.5	22	nC
Total Gate Charge	Q_g(4.5V)			7	10	
Gate Source Charge	Q_{gs}			4		
Gate Drain Charge	Q_{gd}			1.2		
Turn-On Delay Time	t_D(on)	V_{GS}=10V, V_{DS}=75V, R_L=7.5Ω, R_{GEN}=3Ω		6.5		ns
Turn-On Rise Time	t_r			5		
Turn-Off Delay Time	t_D(off)			23		
Turn-Off Fall Time	t_f			2.5		
Body Diode Reverse Recovery Time	t_{rr}	IF=10A, dI/dt=500A/ms		37		ns
Body Diode Reverse Recovery Charge	Q_{rr}	IF=10A, dI/dt=500A/ms		265		nC

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The
Power dissipation PDSM is based on R qJA and the maximum allowed junction temperature of 150°C. The value in any given application depends on the user's specific board design, and the maximum temperature of 150°C may be used if the PCB allows it.
B. The power dissipation P_D is based on $T_{J(MAX)}$=150°C, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.
C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J =25°C.
D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

Electrical Characteristic Curve

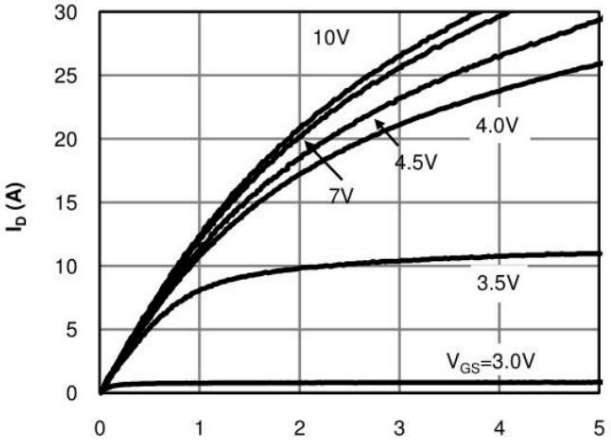


Fig 1: On-Region Characteristics

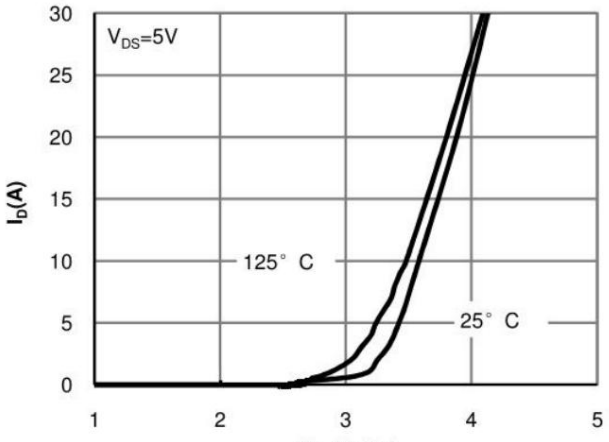


Figure 2: Transfer Characteristics

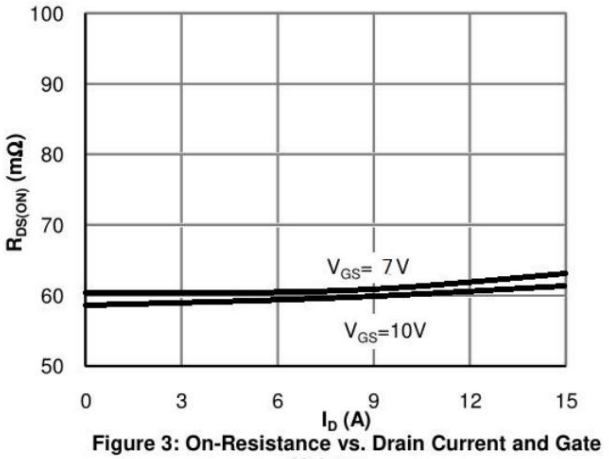


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

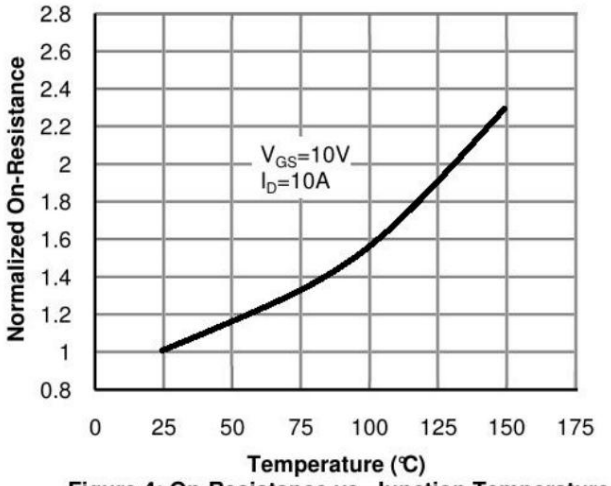


Figure 4: On-Resistance vs. Junction Temperature

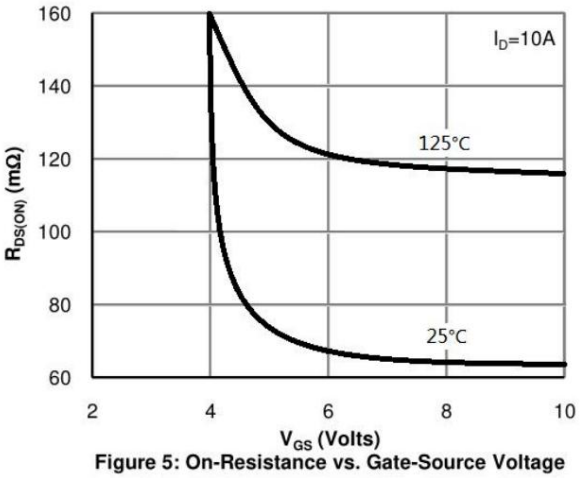


Figure 5: On-Resistance vs. Gate-Source Voltage

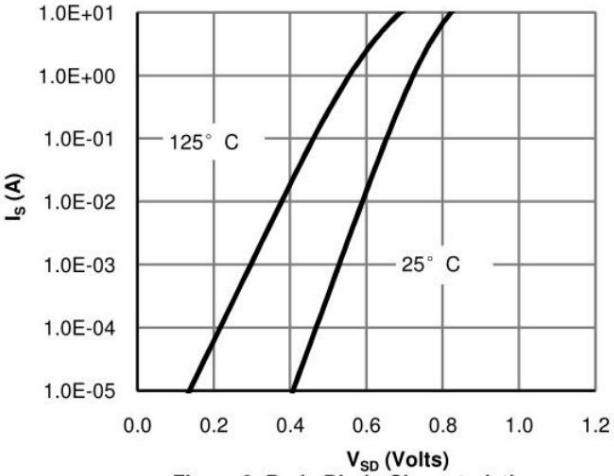


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

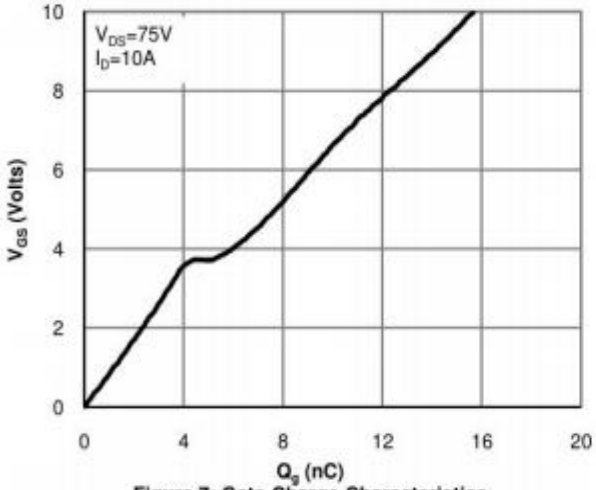


Figure 7: Gate-Charge Characteristics

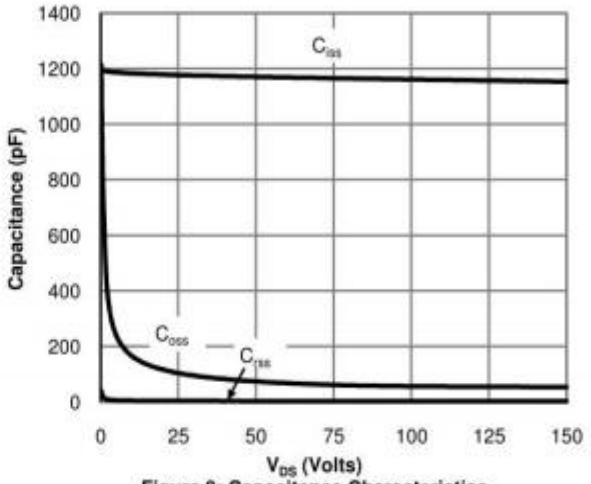


Figure 8: Capacitance Characteristics

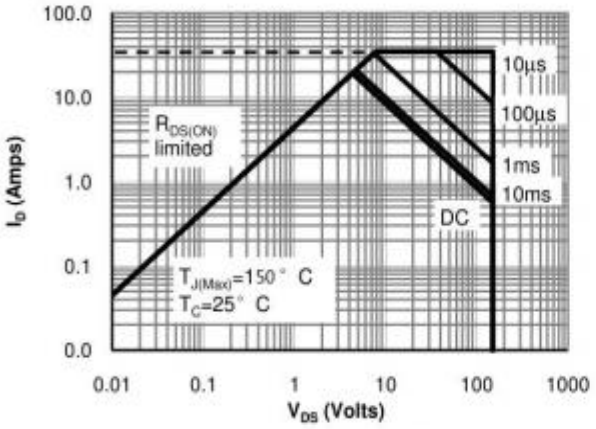


Figure 9: Maximum Forward Biased Safe Operating Area

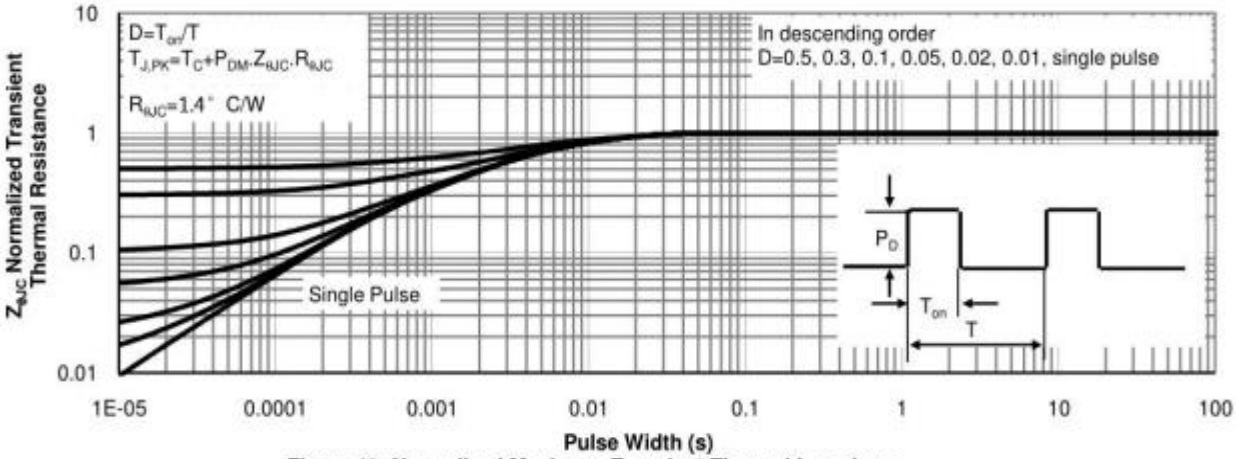
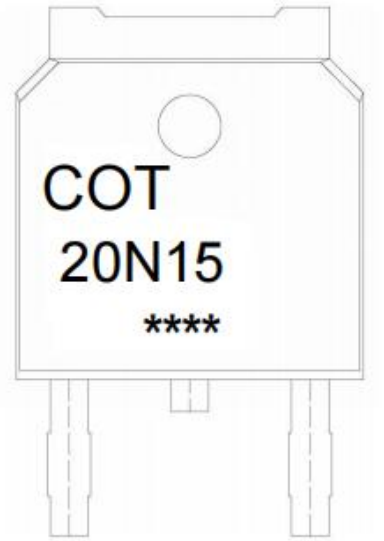


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions



Note:

COT: Company Logo

20N15: Product Type.

****: Lot No. Code, code change with Lot No.

Packaging SPEC

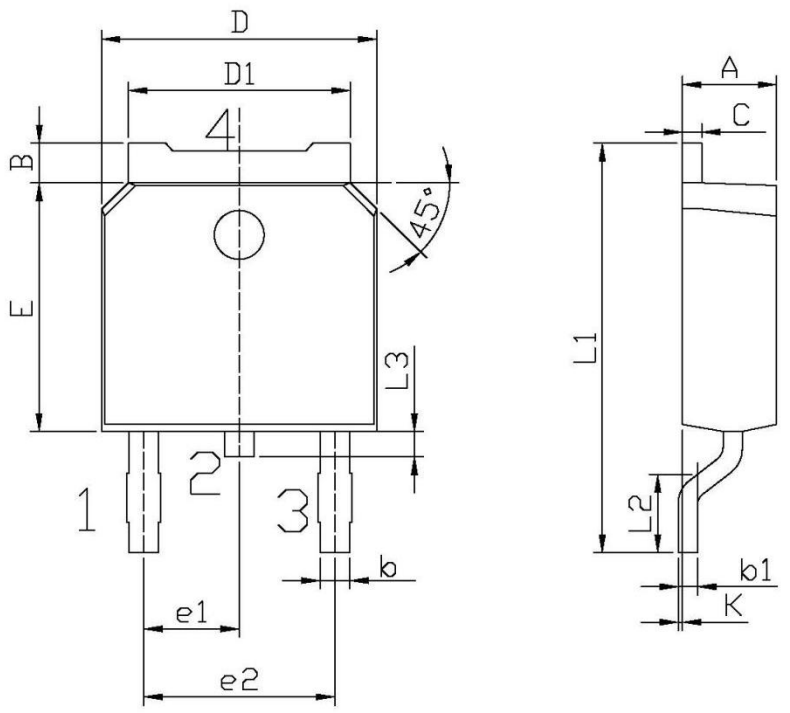
REEL INFORMATION

Package Type	Units					Dimension (unit：mm³)		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
TO-252	2,500	2	5,000	6	30,000	13″ ×16	360×360×50	380×335×366

TUBE INFORMATION

Package Type	Units					Dimension (unit：mm³)		
	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Tube	Inner Box	Outer Box
TO-252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180

Package Outline Dimensions



单位：mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	2.20	2.40	E	5.95	6.25
B	0.95	1.25	e1	2.24	2.34
b	0.70	0.90	e2	4.43	4.73
b1	0.45	0.55	L1	9.85	10.35
C	0.45	0.55	L2	1.70	2.00
D	6.45	6.75	L3	0.60	0.90
D1	5.10	5.50	K	0.00	0.10

TO-252