Descriptions

This 60A, 20V N-Channel MOSFET in a TO-252 Plastic Package.

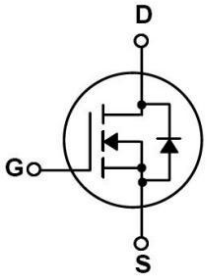
Features

- 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
- And high efficiency switching for power management in portable and battery operated products

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}	20	V
Drain Current		I_D(Tc=25℃)	60	A
		I_D(Tc=100℃)	50	A
Drain Current - Pulsed		I_{DM}	210	A
Gate-Source Voltage		V_{GS}	±12	V
Avalanche Current		I_{AS}	18.3	A
Avalanche energy L=0.5mH		E_{AS}	268	mJ
Power Dissipation		P_D(Tc=25℃)	100	W
		P_D(Tc=100℃)	50	W
Junction and Storage Temperature Range		T_j, T_{stg}	-55～150	℃
Maximum Junction-to-Ambient	Steady-State	$R_{\theta JA}$	62	℃/W
Maximum Junction-to-Case	Steady-State	$R_{\theta JC}$	1.25	

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	20			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V V_{GS}=0V			1.0	μA
		T_J=55°C			5.0	μA
Gate-Body Leakage Current Forward	I_{GSS}	V_{GS}=±12V V_{DS}=0V			±0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=250μA	0.3	0.6	1.0	V
Static Drain-Source On-Resistance	$R_{DS(on)1}$	V_{GS}=10V I_D=60A		5.5	7	mΩ
	$R_{DS(on)2}$	V_{GS}=4.5V I_D=30A		6	7	mΩ
	$R_{DS(on)3}$	V_{GS}=2.5V I_D=15A		8	10	mΩ
Diode Forward Voltage	V_{SD}	I_S=1A V_{GS}=0V		0.9	1.35	V

Electrical Characteristics(Ta=25℃)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C_{iss}	V_{DS}=25V V_{GS}=0V f=1.0MHz		2380		pF
Output Capacitance	C_{oss}			65		
Reverse Transfer Capacitance	C_{rss}			165		
Gate resistance	R_g	V_{GS}=0V V_{DS}=0V f=1MHz		1.28		Ω
Total Gate Charge	Q_g(4.5V)	V_{GS}=10V V_{DS}=10V I_D=20A	28	36	43	nC
Gate Source Charge	Q_{gs}			9		
Gate Drain Charge	Q_{gd}			12		
Turn-On Delay Time	$t_{d(on)}$	V_{GS}=10V V_{DS}=10V R_L=0.5Ω R_{GEN}=3Ω		7		ns
Turn-On Rise Time	t_r			8		
Turn-Off Delay Time	$t_{d(off)}$			70		
Turn-Off Fall Time	t_f			18		
Body Diode Reverse Recovery Time	t_{rr}	I_F=20A dI/dt=500A/ms	13	17	20	ns
Body Diode Reverse Recovery Charge	Q_{rr}	I_F=20A dI/dt=500A/ms	29	36	43	nC

Electrical Characteristic Curve

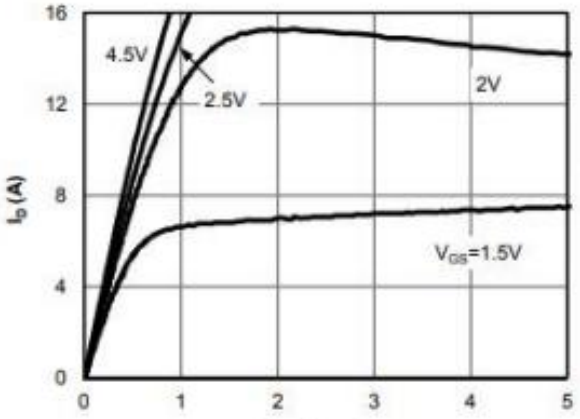


Figure 1: On-Region Characteristics

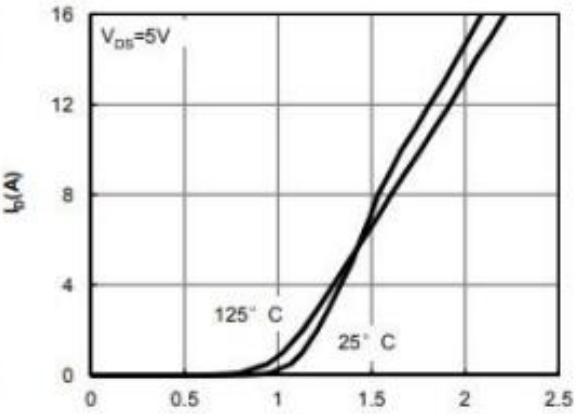


Figure 2: Transfer Characteristics

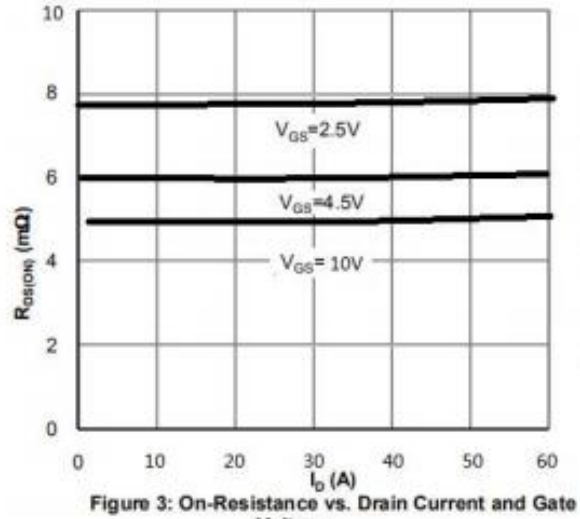


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

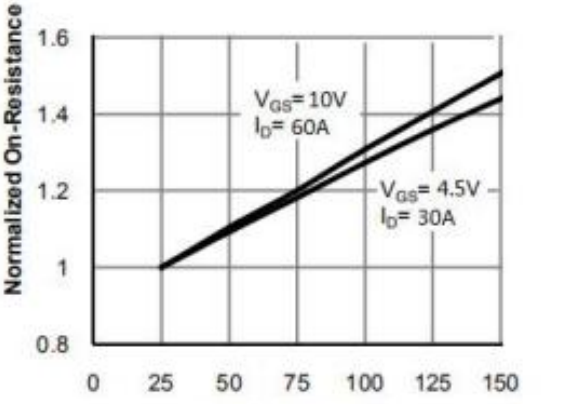


Figure 4: On-Resistance vs. Junction Temperature

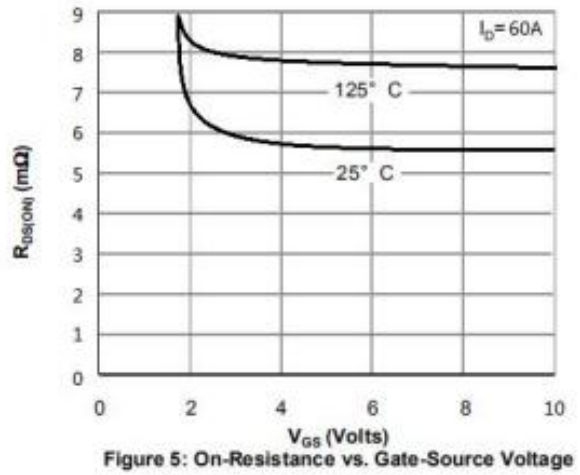


Figure 5: On-Resistance vs. Gate-Source Voltage

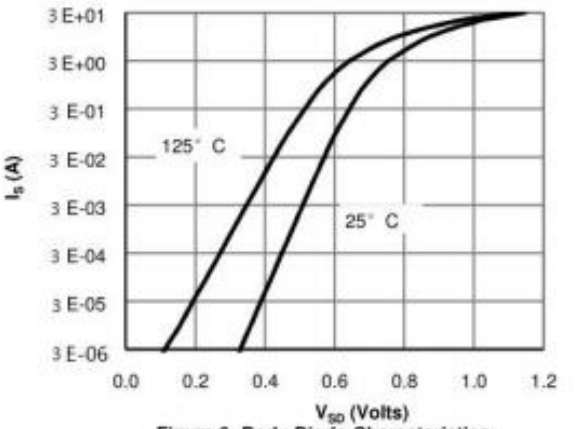


Figure 6: Body-Diode Characteristics

Electrical Characteristic Curve

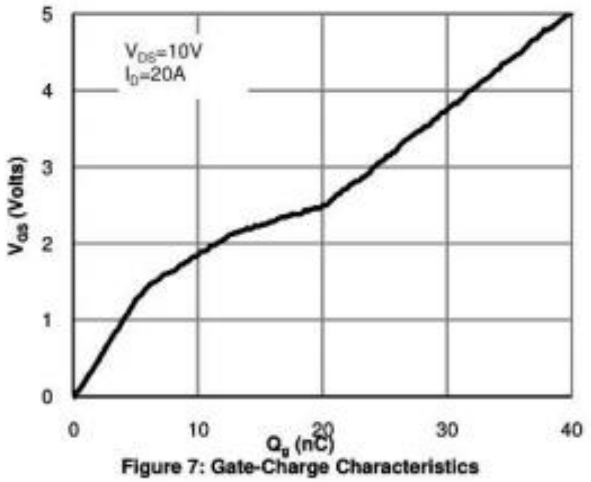


Figure 7: Gate-Charge Characteristics

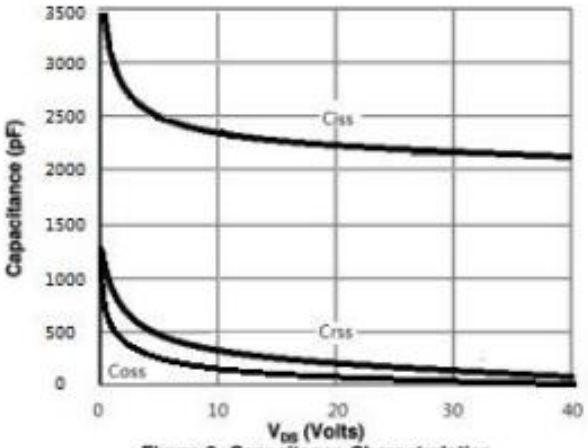


Figure 8: Capacitance Characteristics

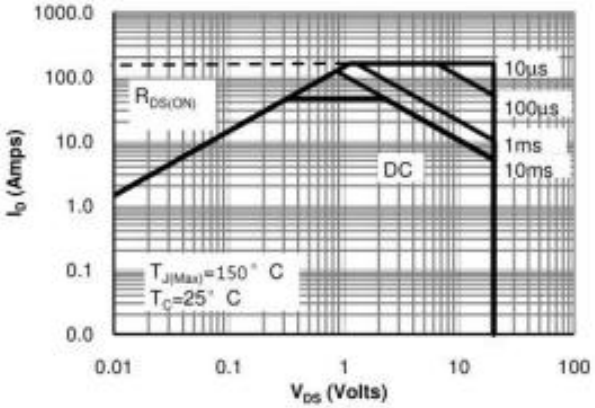


Figure 9: Maximum Forward Biased Safe Operating Area

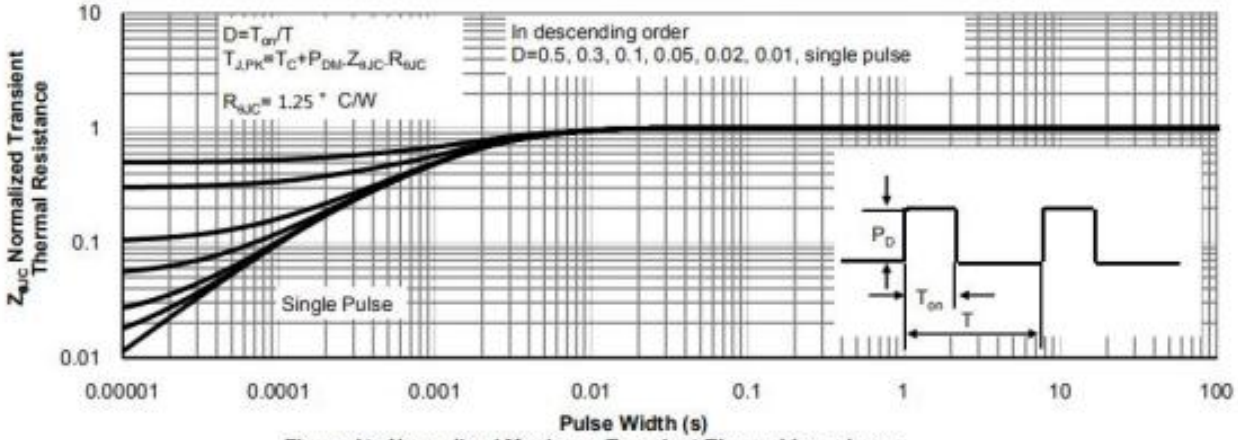


Figure 10: Normalized Maximum Transient Thermal Impedance

Marking Instructions

Note:

COT: Company Logo

60N02: Product Type.

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

Packaging SPEC

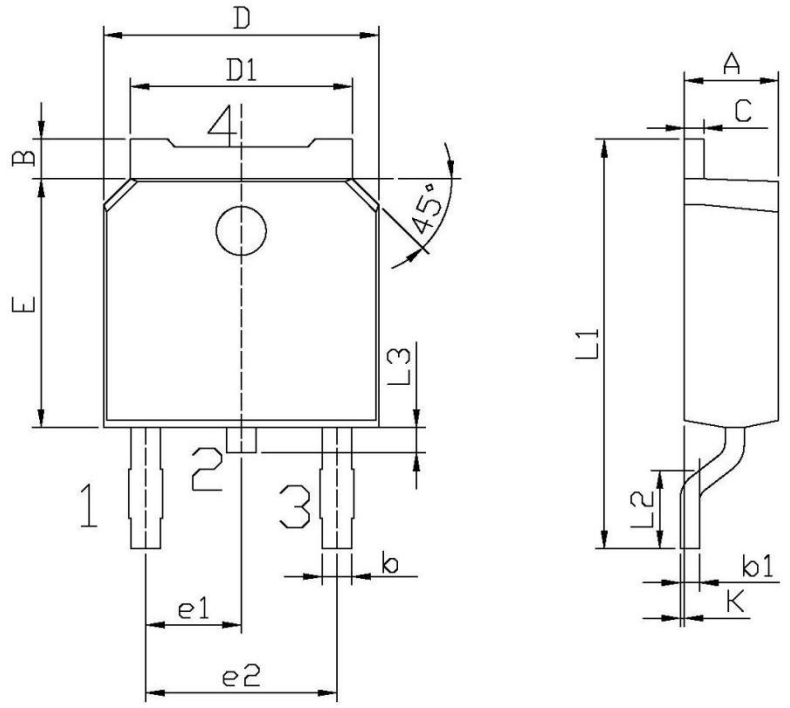
REEL INFORMATION

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