

# GTM CORPORATION

ISSUED DATE :2005/08/24  
REVISED DATE :

## GJ3302

### N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	25V
RDS(ON)	50mΩ
I <sub>D</sub>	16A

### Description

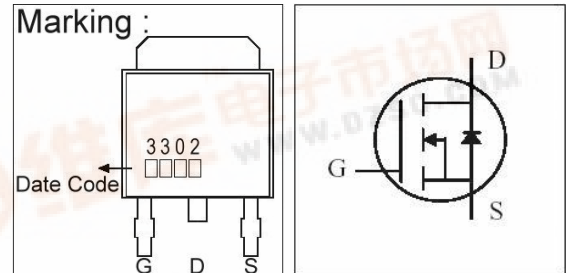
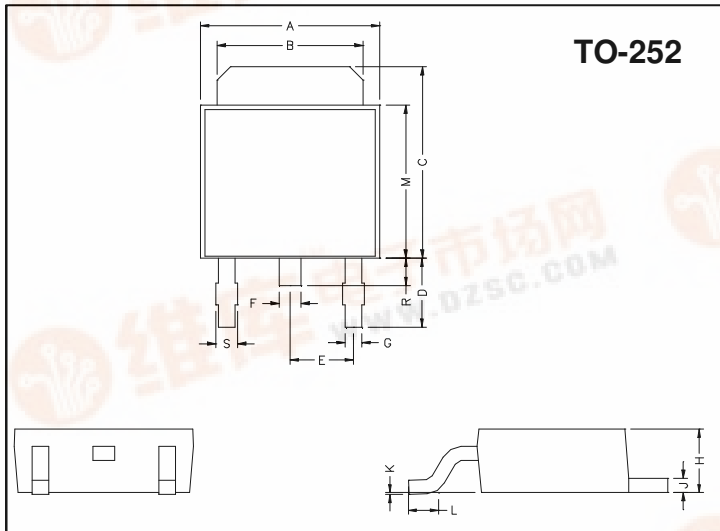
The GJ3302 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-252 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

### Features

- \*Low Gate Charge
- \*Simple Drive Requirement
- \*Fast Switching

### Package Dimensions



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.40	6.80	G	0.50	0.70
B	5.20	5.50	H	2.20	2.40
C	6.80	7.20	J	0.45	0.55
D	2.40	3.00	K	0	0.15
E	2.30 REF.		L	0.90	1.50
F	0.70	0.90	M	5.40	5.80
S	0.60	0.90	R	0.80	1.20

### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	25	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current, V <sub>GS</sub> @10V	I <sub>D</sub> @T <sub>C</sub> =25°C	16	A
Continuous Drain Current, V <sub>GS</sub> @10V	I <sub>D</sub> @T <sub>C</sub> =100°C	10	A
Pulsed Drain Current <sup>1</sup>	I <sub>DM</sub>	25	A
Total Power Dissipation	P <sub>D</sub> @T <sub>C</sub> =25°C	20	W
Linear Derating Factor		0.16	W/°C
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 ~ +150	°C

### Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-case	R <sub>thj-c</sub>	6.4	°C/W
Thermal Resistance Junction-ambient	R <sub>thj-a</sub>	110	°C/W

**Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	25	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	2.0	-	4.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	1	uA	V <sub>DS</sub> =25V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =150°C)		-	-	25	uA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	50	mΩ	V <sub>GS</sub> =10V, I <sub>D</sub> =8A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	7.4	13	nC	I <sub>D</sub> =10A V <sub>DS</sub> =20V V <sub>GS</sub> =10V
Gate-Source Charge	Q <sub>gs</sub>	-	2.2	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	4.2	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	8	-	ns	V <sub>DS</sub> =15V I <sub>D</sub> =16A V <sub>GS</sub> =10V R <sub>G</sub> =3.3Ω R <sub>D</sub> =0.94Ω
Rise Time	T <sub>r</sub>	-	7.4	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	11	-		
Fall Time	T <sub>f</sub>	-	3	-		
Input Capacitance	C <sub>iss</sub>	-	164	290	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =25V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	158	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	62	-		

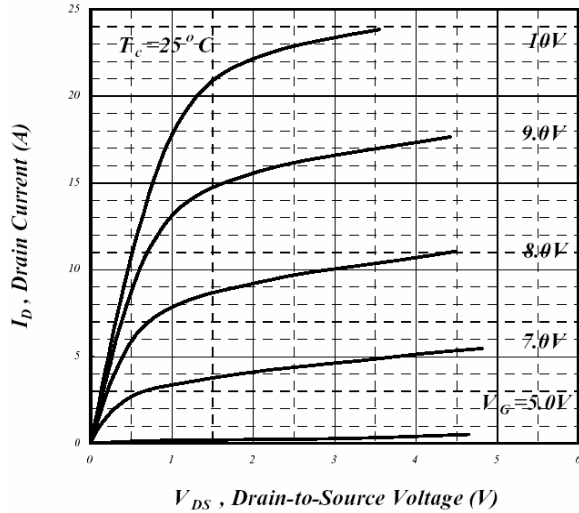
**Source-Drain Diode**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	1.3	V	I <sub>S</sub> =16A, V <sub>GS</sub> =0V
Reverse Recovery Time	T <sub>rr</sub>	-	29	-	Ns	I <sub>S</sub> =16A, V <sub>GS</sub> =0V dI/dt=100A/μs
Reverse Recovery Charge	Q <sub>rr</sub>	-	21	-	nC	

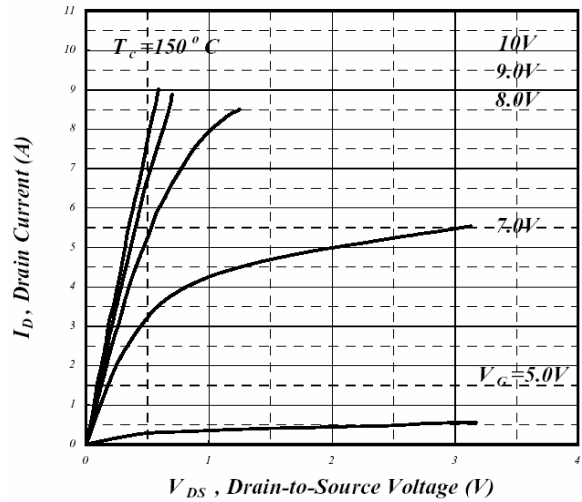
Notes: 1. Pulse width limited by safe operating area.

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

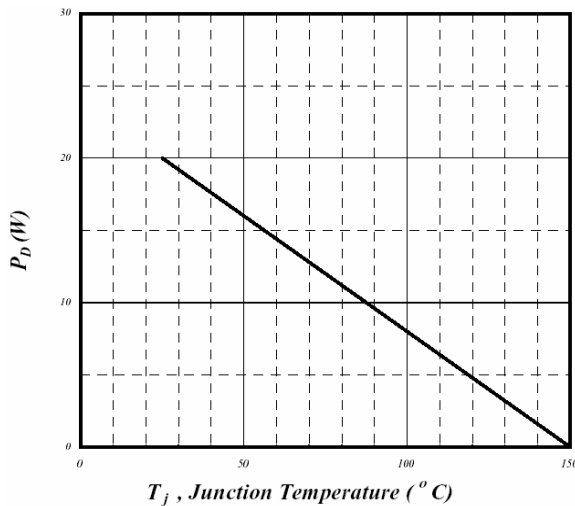
## Characteristics Curve



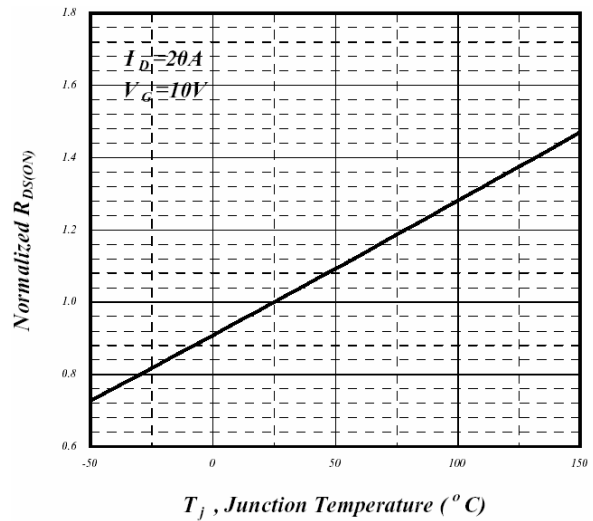
**Fig 1. Typical Output Characteristics**



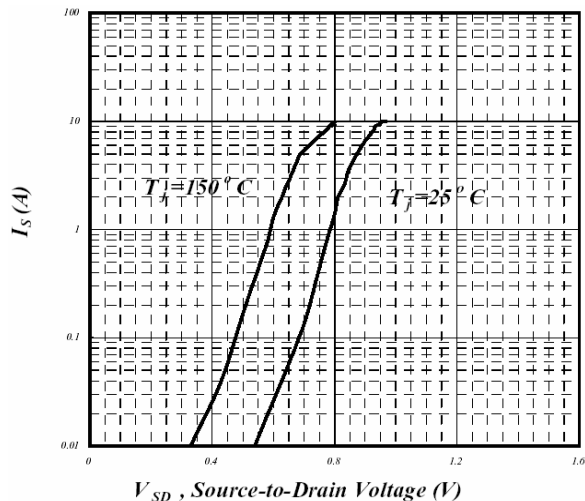
**Fig 2. Typical Output Characteristics**



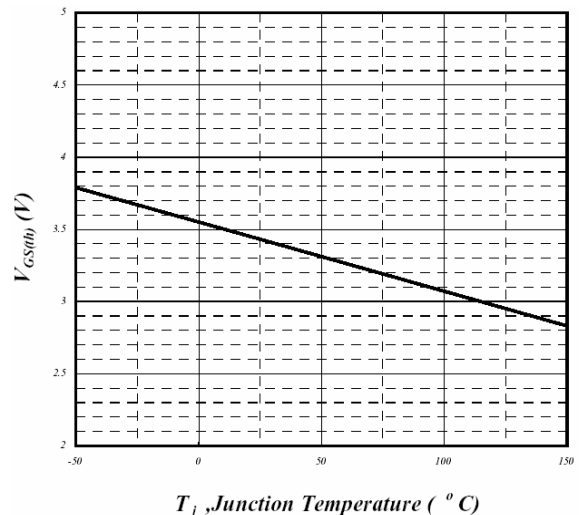
**Fig 3. Type Power Dissipation**



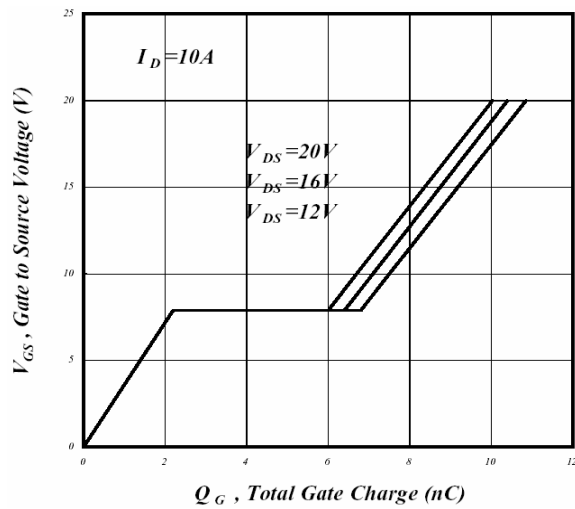
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



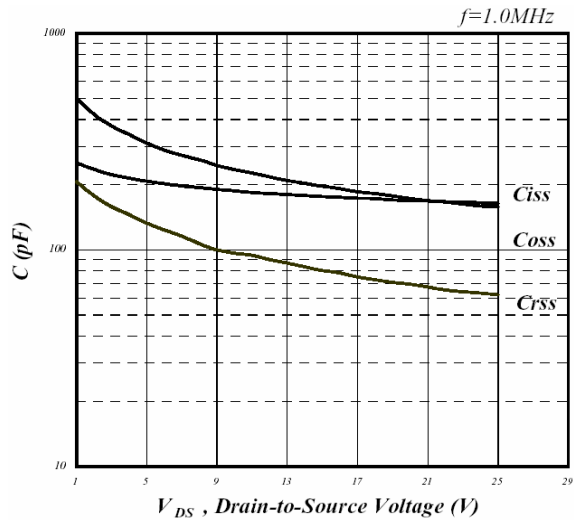
**Fig 5. Forward Characteristics of Reverse Diode**



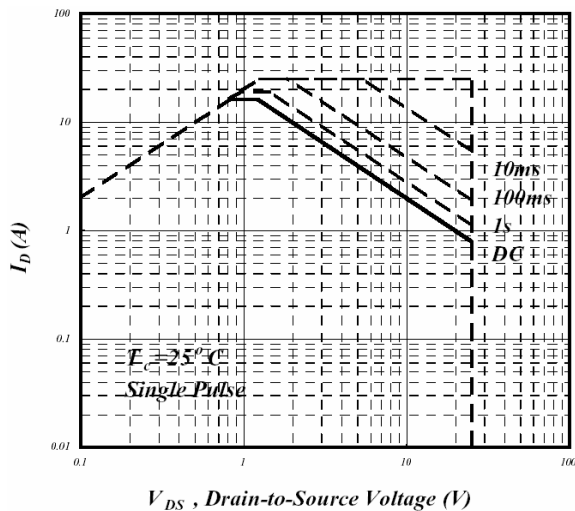
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



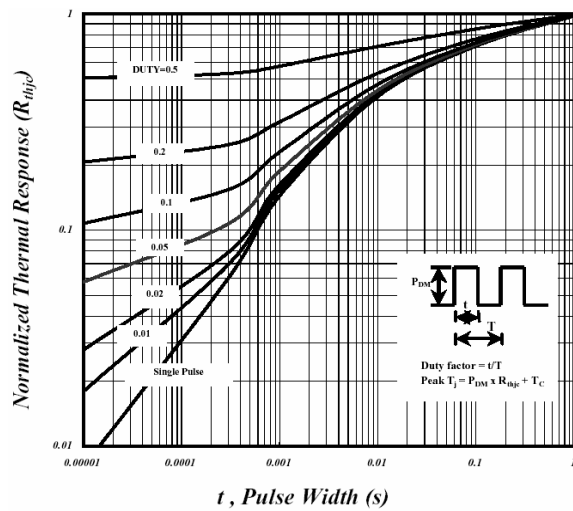
**Fig 7. Gate Charge Characteristics**



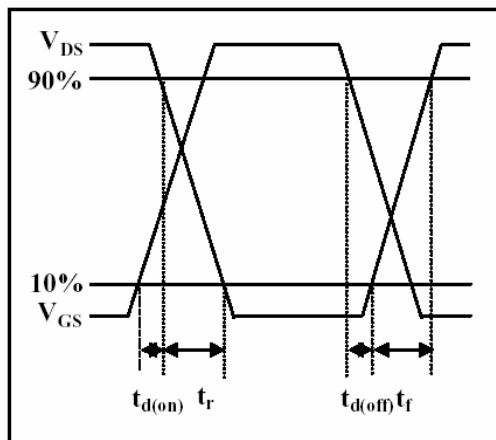
**Fig 8. Typical Capacitance Characteristics**



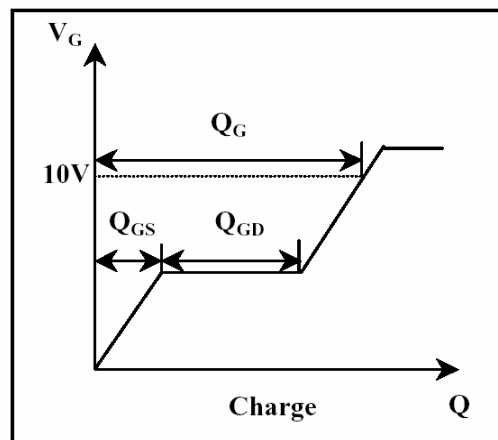
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**

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