

# GTM CORPORATION

ISSUED DATE :2004/10/18  
REVISED DATE :2006/07/27B

## GTC9926

### N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	20V
RDS(ON)	28mΩ
ID	6A

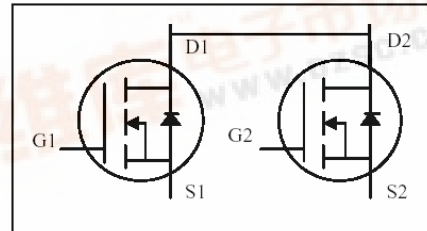
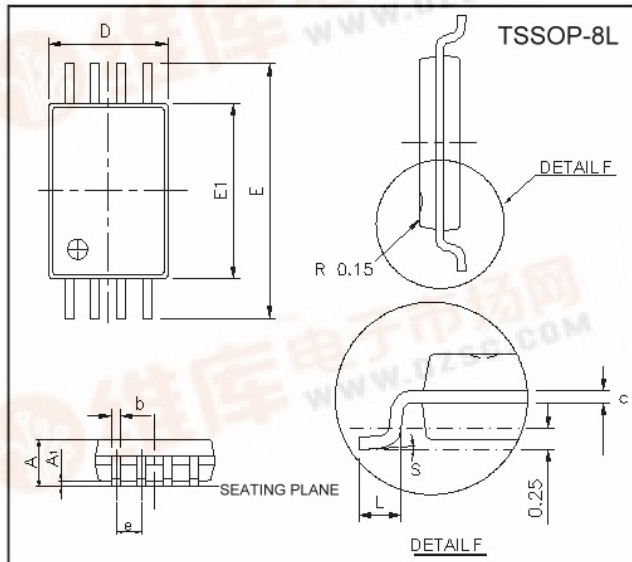
### Description

The GTC9926 provides the designer with the best combination of fast switching, ruggedized device design, ultra low on-resistance and cost-effectiveness.

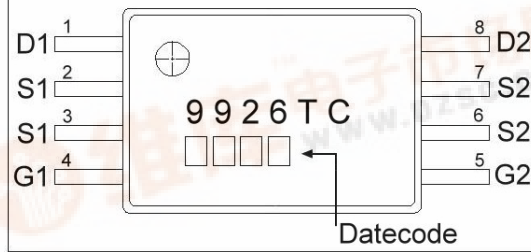
### Features

- \*Low on-resistance
- \*Capable of 2.5V gate drive
- \*Low drive current

### Package Dimensions



### Marking:



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	-	1.20	E	6.20	6.60
A1	0.05	0.15	E1	4.30	4.50
b	0.19	0.30	e	0.65 BSC	
c	0.09	0.20	L	0.45	0.75
D	2.90	3.10	S	0°	8°

### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	±12	V
Drain Current <sup>3</sup> , $V_{GS}@4.5V$	$I_D @Ta=25^{\circ}C$	6	A
Drain Current <sup>3</sup> , $V_{GS}@4.5V$	$I_D @Ta=70^{\circ}C$	4.8	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	20	A
Power Dissipation	$P_D @Ta=25^{\circ}C$	1	W
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	-55 ~ +150	°C
Linear Derating Factor		0.008	W/°C

### Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient <sup>3</sup> Max.	$R_{thj-a}$	125	°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>	20	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250uA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_j$	-	0.03	-	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.5	-	1.2	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA
Forward Transconductance	g <sub>fs</sub>	-	20	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =6A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±12V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	1	uA	V <sub>DS</sub> =20V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =70°C)		-	-	25	uA	V <sub>DS</sub> =16V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	28	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6.0A
		-	-	38		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.2A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	23	-	nC	I <sub>D</sub> =6A V <sub>DS</sub> =20V V <sub>GS</sub> =5.0V
Gate-Source Charge	Q <sub>gs</sub>	-	4.5	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	7	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	30	-	ns	V <sub>DS</sub> =10V I <sub>D</sub> =1A V <sub>GS</sub> =5V R <sub>G</sub> =6Ω R <sub>D</sub> =10Ω
Rise Time	T <sub>r</sub>	-	70	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	40	-		
Fall Time	T <sub>f</sub>	-	65	-		
Input Capacitance	C <sub>iss</sub>	-	1035	-	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =20V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	320	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	150	-		

**Source-Drain Diode**

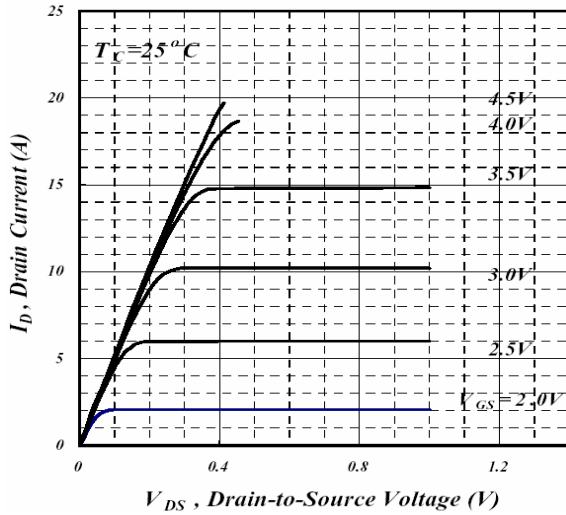
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	1.2	V	I <sub>S</sub> =1.7A, V <sub>GS</sub> =0, T <sub>j</sub> =25°C
Continuous Source Current(Body Diode)	I <sub>S</sub>	-	-	1.54	A	V <sub>D</sub> = V <sub>G</sub> =0V, V <sub>S</sub> =1.3V

Notes: 1. Pulse width limited by Max. junction temperature.

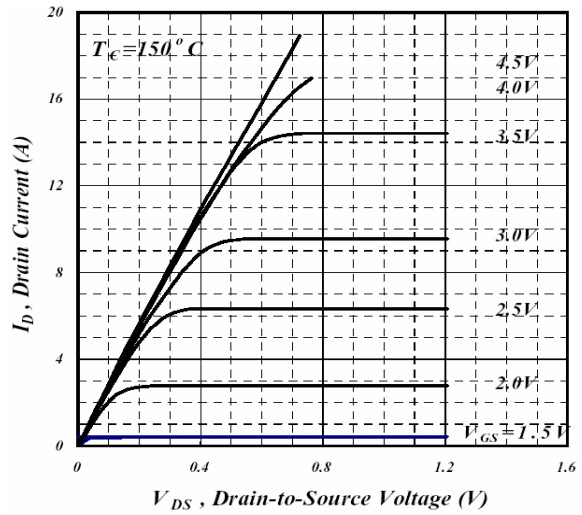
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 208°C/W when mounted on Min. copper pad.

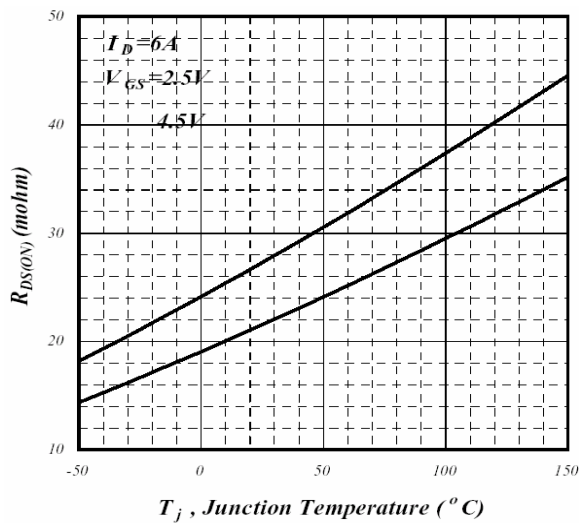
## Characteristics Curve



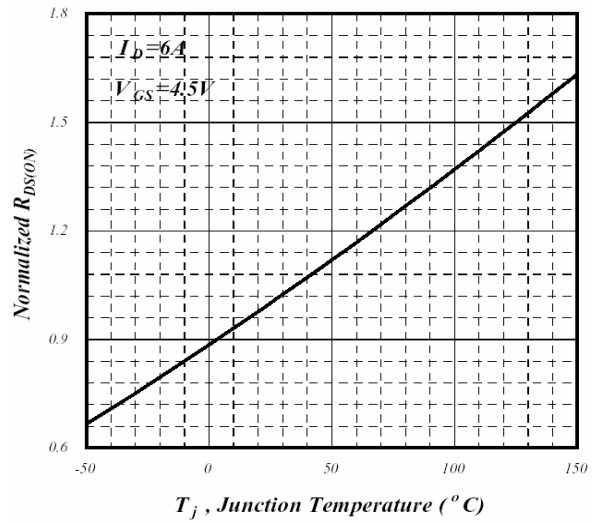
**Fig 1. Typical Output Characteristics**



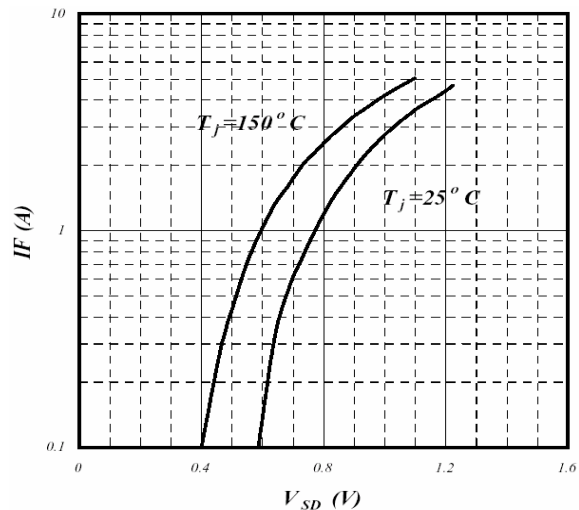
**Fig 2. Typical Output Characteristics**



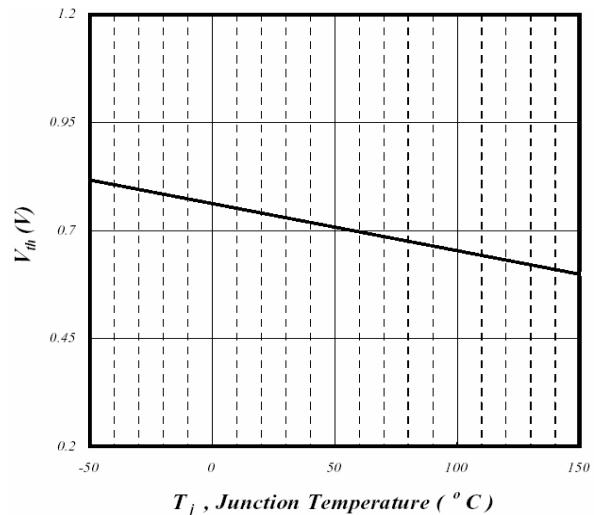
**Fig 3.  $R_{DS(on)}$  v.s. Junction Temperature**



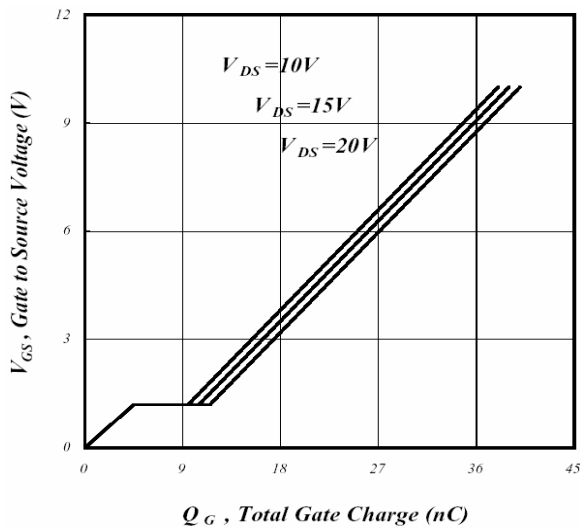
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



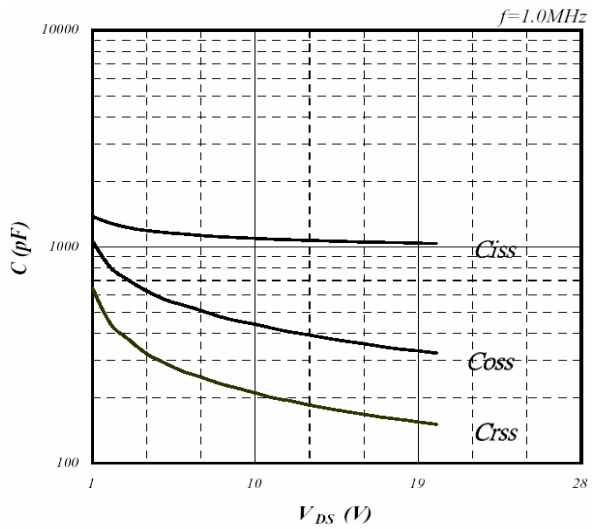
**Fig 5. Forward Characteristics of Reverse Diode**



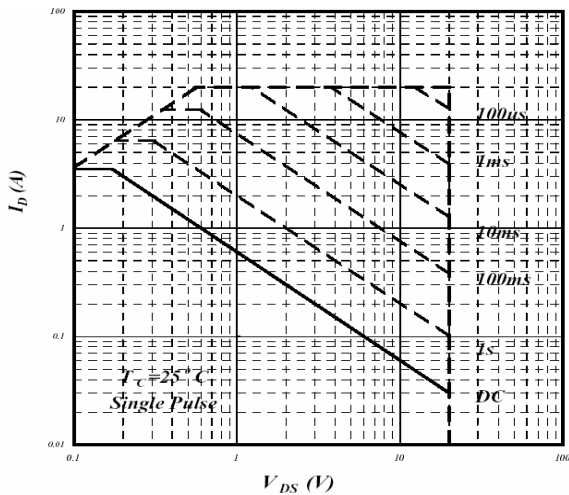
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



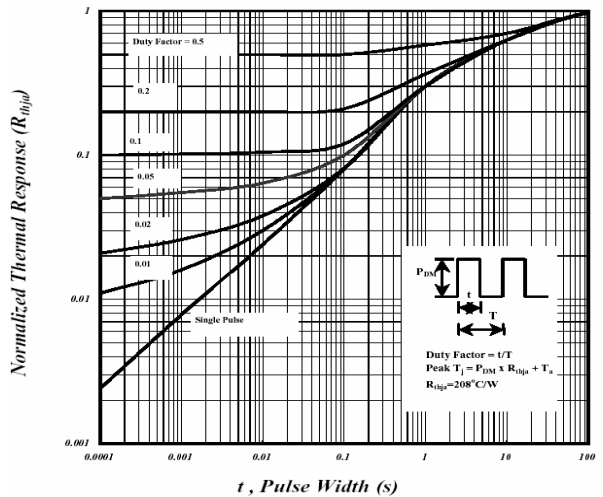
**Fig 7. Gate Charge Characteristics**



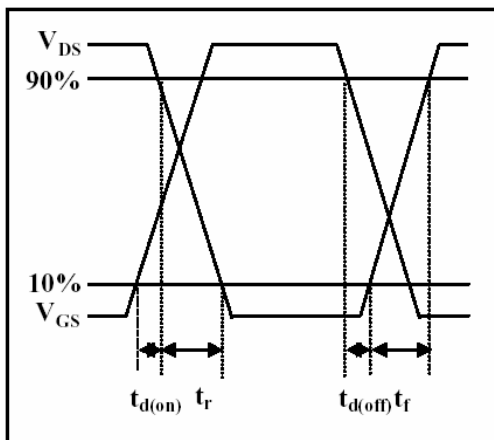
**Fig 8. Typical Capacitance Characteristics**



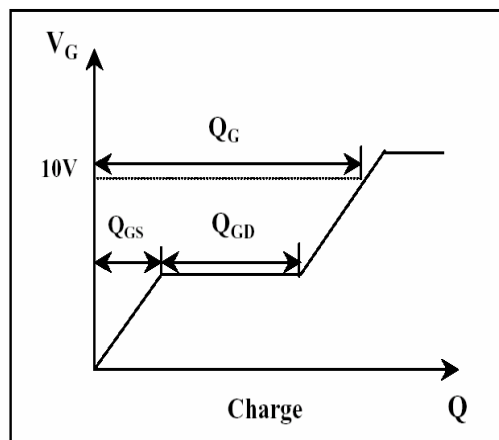
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**

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