

GU9971

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV _{DSS}	60V
R _{DS(ON)}	36mΩ
I _D	25A

Description

The GU9971 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

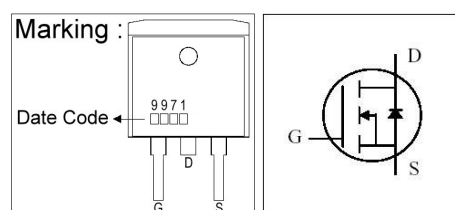
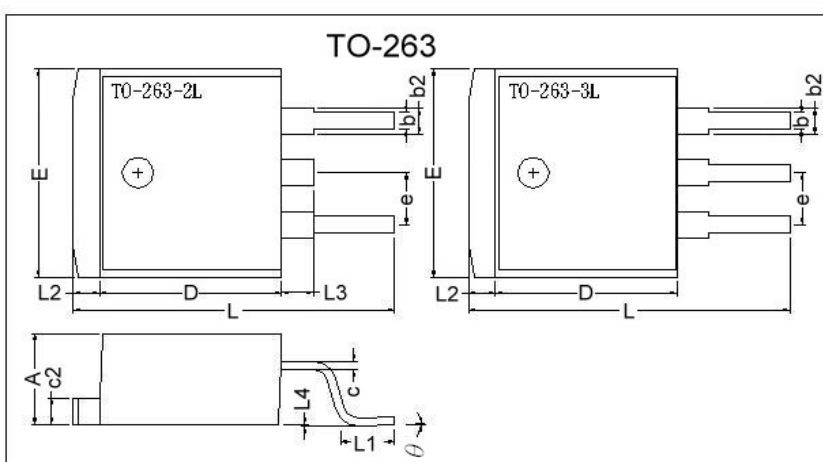
The TO-263 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

Features

*Simple Drive Requirement

*Low On-resistance

Package Dimensions



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.40	4.80	c2	1.25	1.45
b	0.76	1.00	b2	1.17	1.47
L4	0.00	0.30	D	8.6	9.0
c	0.36	0.5	e	2.54 REF.	
L3	1.50 REF.		L	14.6	15.8
L1	2.29	2.79	θ	0°	8°
E	9.80	10.4	L2	1.27 REF.	

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=25^{\circ}C$	25	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=100^{\circ}C$	16	A
Pulsed Drain Current ¹	I_{DM}	80	A
Total Power Dissipation	$P_D @T_C=25^{\circ}C$	39	W
Linear Derating Factor		0.31	W/ $^{\circ}C$
Operating Junction and Storage Temperature Range	T_j, T_{stg}	-55 ~ +150	$^{\circ}C$

Thermal Data

Parameter		Symbol	Value	Unit
Thermal Resistance Junction-case	Max.	Rthj-c	3.2	°C/W
Thermal Resistance Junction-ambient	Max.	Rthj-a	62	°C/W

Electrical Characteristics (T_j = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV _{DSS}	60	-	-	V	V _{GS} =0, I _D =250uA
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} / ΔT _j	-	0.05	-	V/°C	Reference to 25°C, I _D =1mA
Gate Threshold Voltage	V _{GS(th)}	1.0	-	3.0	V	V _{DS} =V _{GS} , I _D =250uA
Forward Transconductance	g _{fs}	-	17	-	S	V _{DS} =10V, I _D =18A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V
Drain-Source Leakage Current(T _j =25°C)	I _{DSS}	-	-	10	uA	V _{DS} =60V, V _{GS} =0
Drain-Source Leakage Current(T _j =150°C)		-	-	25	uA	V _{DS} =48V, V _{GS} =0
Static Drain-Source On-Resistance ²	R _{DS(ON)}	-	-	36	mΩ	V _{GS} =10V, I _D =18A
		-	-	50		V _{GS} =4.5V, I _D =12A
Total Gate Charge ²	Q _g	-	18	30	nC	I _D =18A V _{DS} =48V V _{GS} =4.5V
Gate-Source Charge	Q _{gs}	-	6	-		
Gate-Drain ("Miller") Charge	Q _{gd}	-	11	-		
Turn-on Delay Time ²	T _{d(on)}	-	9	-	ns	V _{DS} =30V I _D =18A V _{GS} =10V R _G =3.3Ω R _D =1.67Ω
Rise Time	T _r	-	24	-		
Turn-off Delay Time	T _{d(off)}	-	26	-		
Fall Time	T _f	-	7	-		
Input Capacitance	C _{iss}	-	1700	2700	pF	V _{GS} =0V V _{DS} =25V f=1.0MHz
Output Capacitance	C _{oss}	-	160	-		
Reverse Transfer Capacitance	C _{rss}	-	110	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V _{SD}	-	-	1.2	V	I _S =25A, V _{GS} =0V
Reverse Recovery Time	T _{rr}	-	37	-	ns	I _S =18A, V _{GS} =0V di/dt=100A/μs
Reverse Recovery Charge	Q _{rr}	-	38	-	nC	

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

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

Characteristics Curve

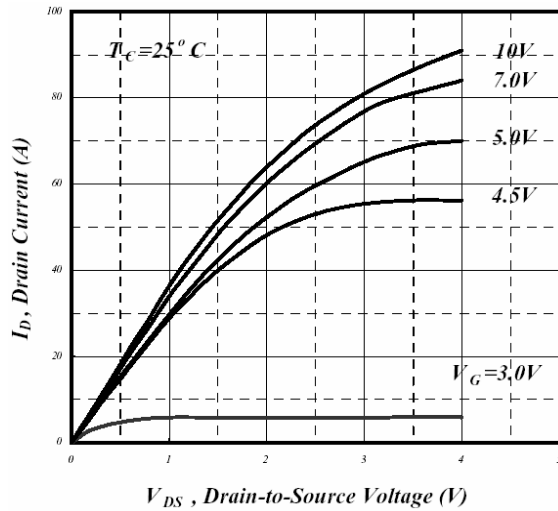


Fig 1. Typical Output Characteristics

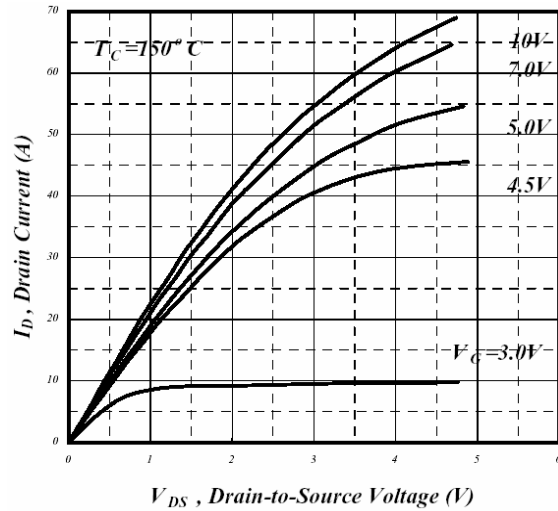


Fig 2. Typical Output Characteristics

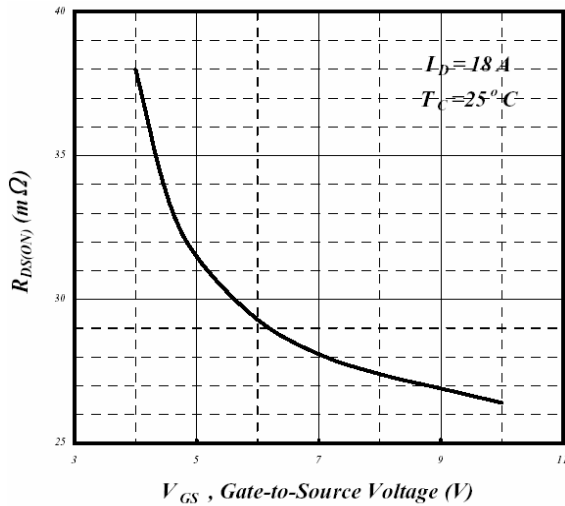


Fig 3. On-Resistance v.s. Gate Voltage

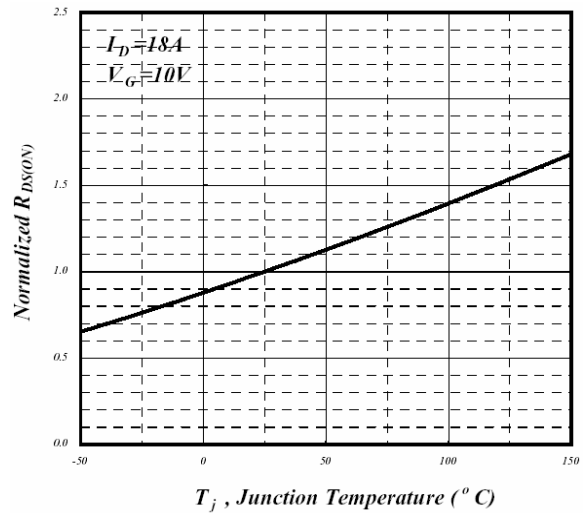


Fig 4. Normalized On-Resistance v.s. Junction Temperature

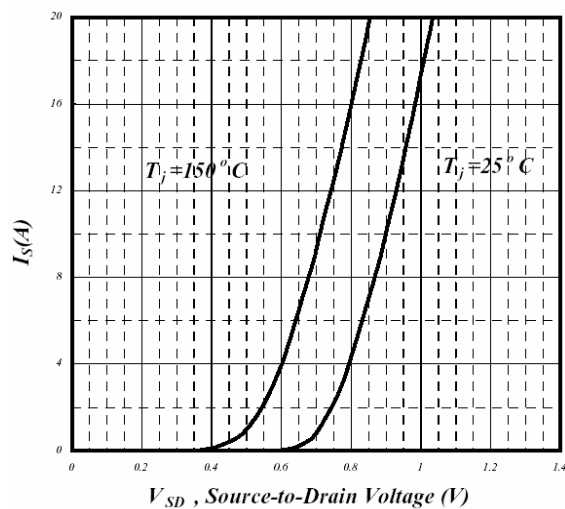


Fig 5. Forward Characteristics of Reverse Diode

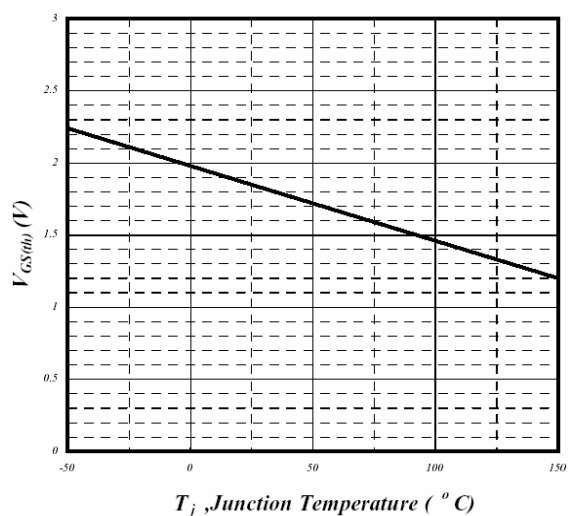


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

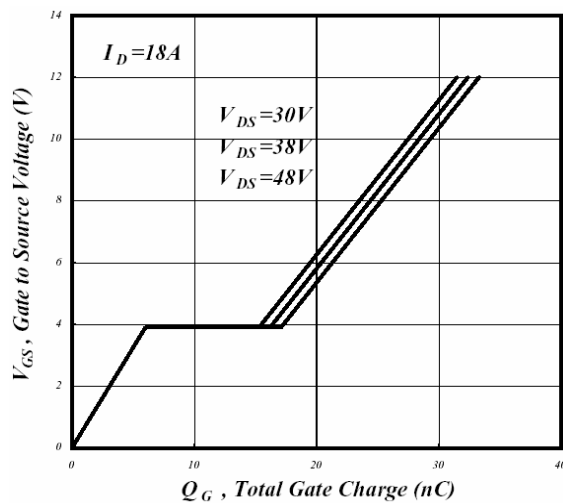


Fig 7. Gate Charge Characteristics

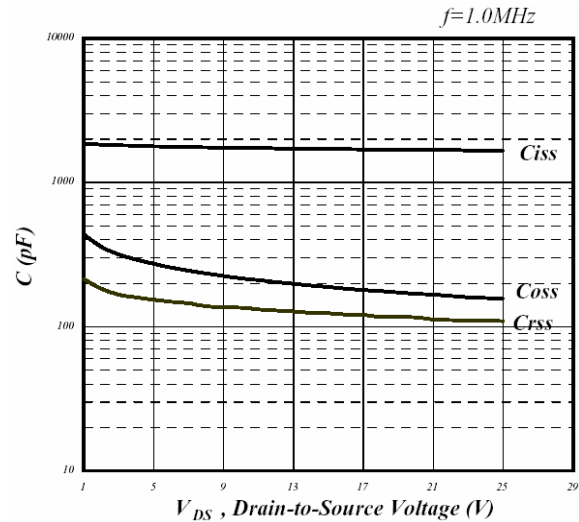


Fig 8. Typical Capacitance Characteristics

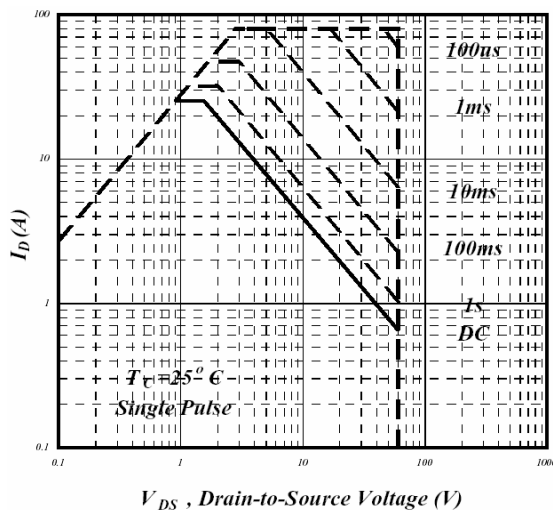


Fig 9. Maximum Safe Operating Area

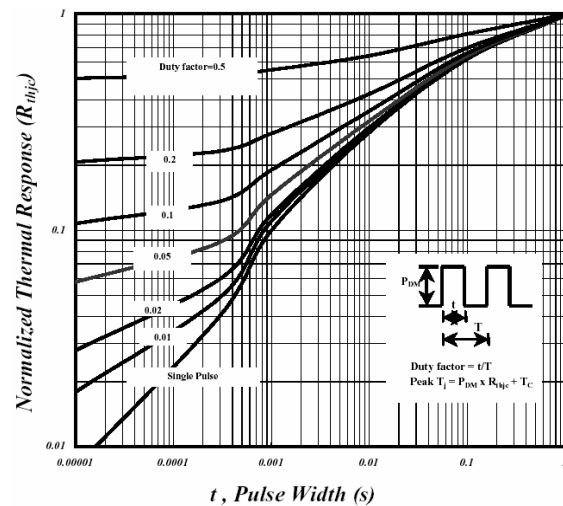


Fig 10. Effective Transient Thermal Impedance

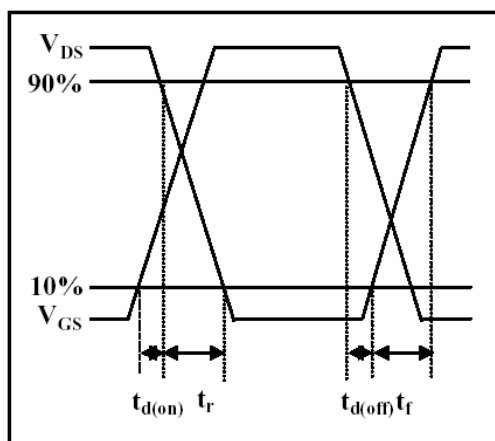


Fig 11. Switching Time Waveform

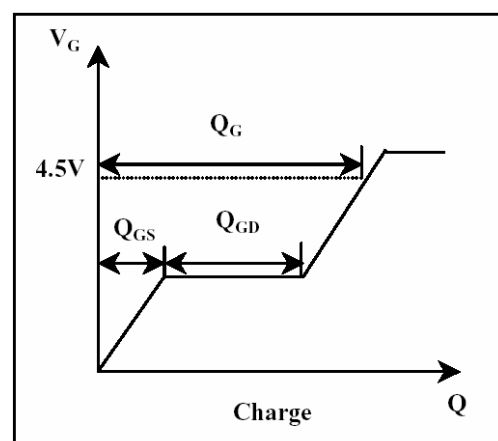


Fig 12. Gate Charge Waveform

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