

RoHS Compliant Product
A suffix of "-C" specifies halogen-free

DESCRIPTION

The SID9575 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

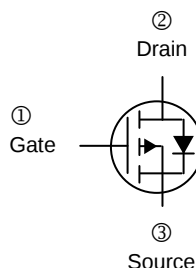
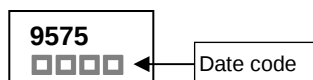
FEATURES

- Simple Drive Requirement
- Lower On-resistance
- Fast Switching Characteristic

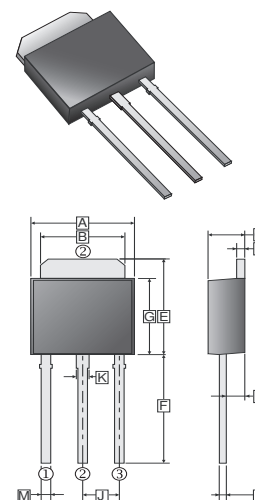
APPLICATION

The through-hole version (TO-251) is available for low-profile applications and suited for low voltage applications such as DC / DC converters.

MARKING:



TO-251



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.40	6.80	G	5.40	5.80
B	5.20	5.50	H	0.90	1.50
C	2.20	2.40	J	2.30	
D	0.45	0.55	K	0.60	0.90
E	6.80	7.20	M	0.50	0.70
F	7.20	7.80	P	0.45	0.60

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	-60	V
Gate-Source Voltage		V_{GS}	±25	V
Continuous Drain Current	$V_{GS}=10V, T_C=25^{\circ}C$	I_D	-15	A
	$V_{GS}=10V, T_C=100^{\circ}C$		-9.5	A
Pulsed Drain Current ¹		I_{DM}	-45	A
Total Power Dissipation @ $T_C = 25^{\circ}C$		P_D	36	W
Thermal Resistance Junction-case		$R_{\theta JC}$	3.5	$^{\circ}C / W$
Thermal Resistance Junction-ambient		$R_{\theta JA}$	110	$^{\circ}C / W$
Linear Derating Factor			0.29	W / $^{\circ}C$
Operating Junction & Storage temperature		T_J, T_{STG}	-55~150	$^{\circ}C$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV _{DSS}	-60	-	-	V	V _{GS} =0, I _D = -250μA
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} / ΔT _J	-	-0.06	-	V / °C	Reference to 25°C, I _D = -1mA
Gate Threshold Voltage		V _{GS(th)}	-1	-	-3	V	V _{DS} =V _{GS} , I _D = -250 μA
Forward Trans-conductance		g _{fs}	-	14	-	S	V _{DS} = -10V, I _D = -9A
Gate-Source Leakage Current		I _{GSS}	-	-	±100	nA	V _{GS} = ±25V
Drain-Source Leakage Current	T _J =25°C	I _{DSS}	-	-	-1	uA	V _{DS} = -60 V, V _{GS} =0
	T _J =150°C		-	-	-25		V _{DS} = -48 V, V _{GS} =0
Static Drain-Source On-Resistance ²		R _{DS(ON)}	-	-	90	mΩ	V _{GS} = -10 V, I _D = -12A
			-	-	120		V _{GS} = -4.5 V, I _D = -9 A
Total Gate Charge ²		Q _g	-	17	27	nC	I _D = -9 A
Gate-Source Charge		Q _{gs}	-	5	-		V _{DS} = -48 V
Gate-Drain (“Miller”) Charge		Q _{gd}	-	6	-		V _{GS} = -4.5 V
Turn-on Delay Time ²		T _{d(on)}	-	10	-	nS	V _{DS} = -30 V
Rise Time		T _r	-	19	-		I _D = -9 A
Turn-off Delay Time		T _{d(off)}	-	46	-		V _{GS} = -10 V
Fall Time		T _f	-	53	-		R _G =3.3 Ω R _D =3.3 Ω
Input Capacitance		C _{iss}	-	1660	2660	pF	V _{GS} =0
Output Capacitance		C _{oss}	-	160	-		V _{DS} = -25V
Reverse Transfer Capacitance		C _{rss}	-	100	-		f=1 MHz
Source-Drain Diode							
Forward On Voltage ²		V _{SD}	-	-	-1.2	V	I _S = -9A, V _{GS} =0
Reverse Recovery Time ²		T _{rr}	-	56	-	nS	I _S = -9 A, V _{GS} =0
Reverse Recovery Charge		Q _{rr}	-	159	-	nC	di/dt=100A / μs

Notes:

1. Pulse width limited by safe operating area.
2. Pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$

CHARACTERISTIC CURVES

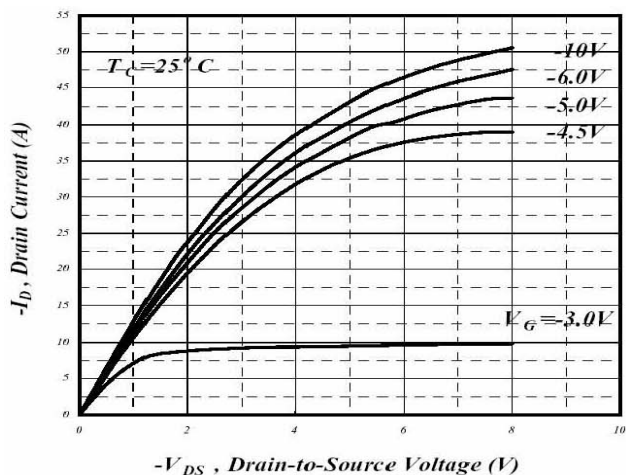


Fig 1. Typical Output Characteristics

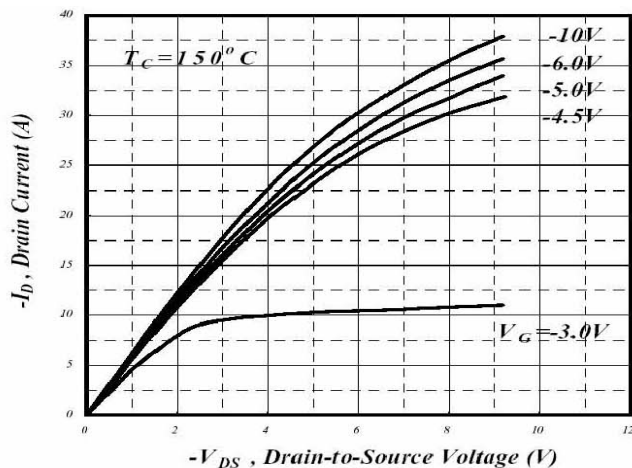


Fig 2. Typical Output Characteristics

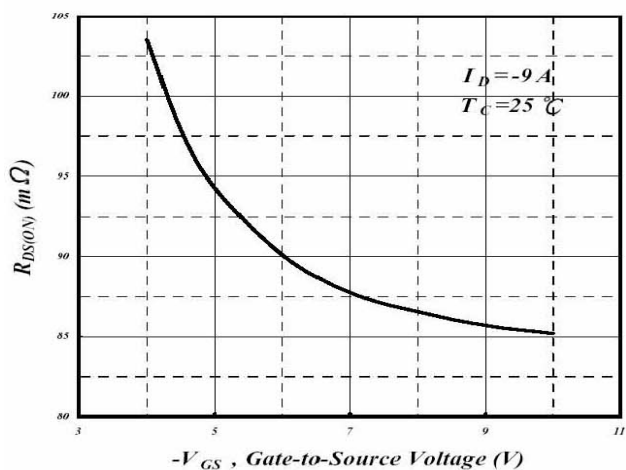


Fig 3. On-Resistance v.s. Gate Voltage

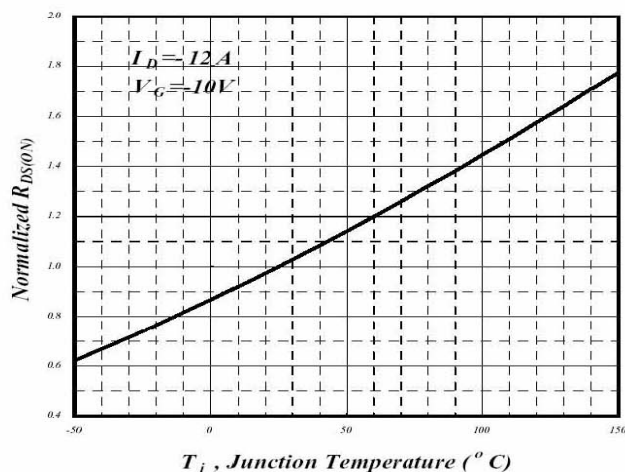


Fig 4. Normalized On-Resistance v.s. Junction Temperature

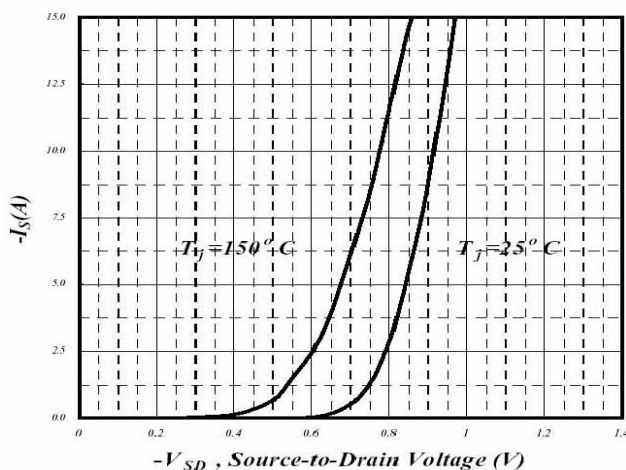


Fig 5. Forward Characteristics of Reverse Diode

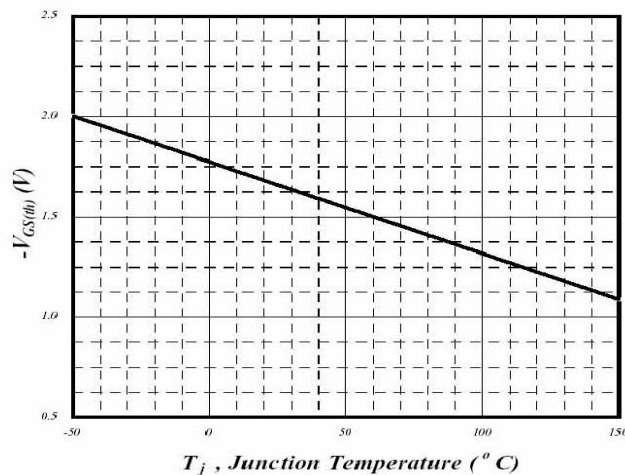


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

CHARACTERISTIC CURVES

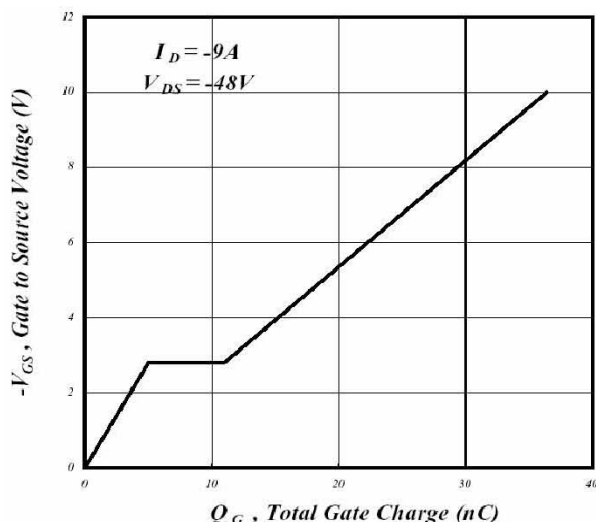


Fig 7. Gate Charge Characteristics

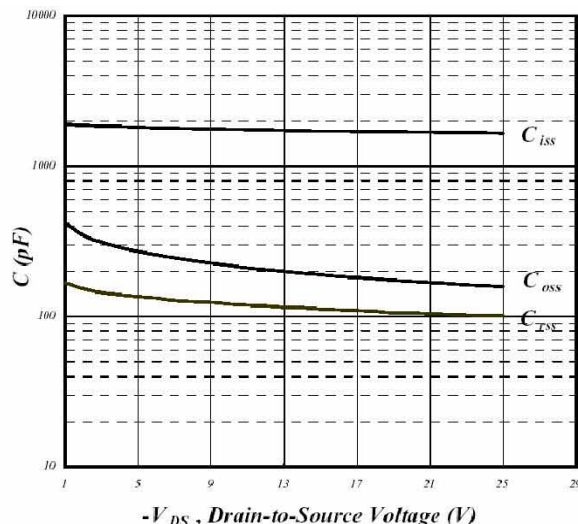


Fig 8. Typical Capacitance Characteristics

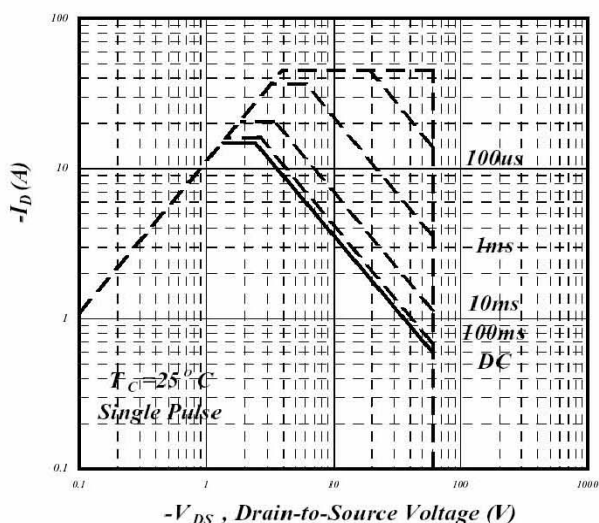


Fig 9. Maximum Safe Operating Area

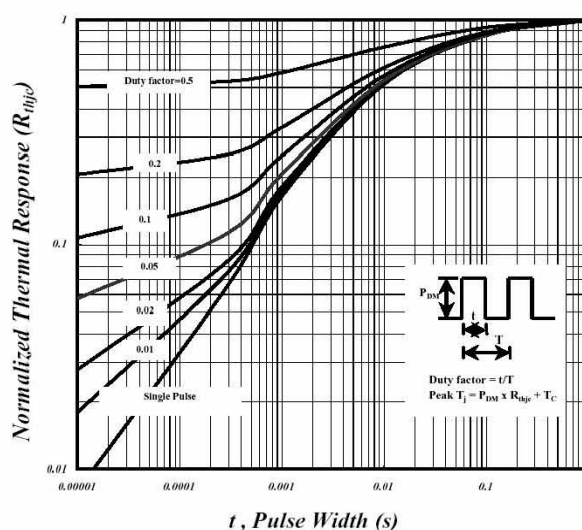


Fig 10. Effective Transient Thermal Impedance

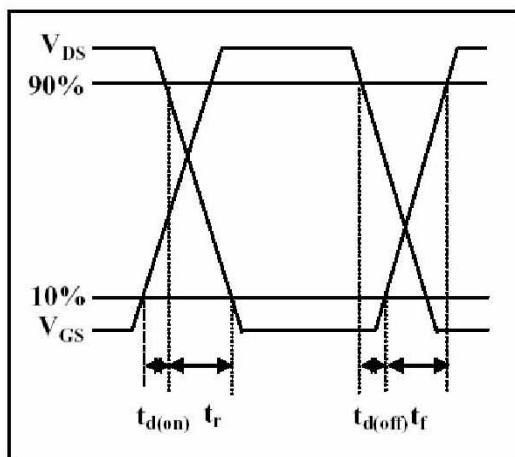


Fig 11. Switching Time Waveform

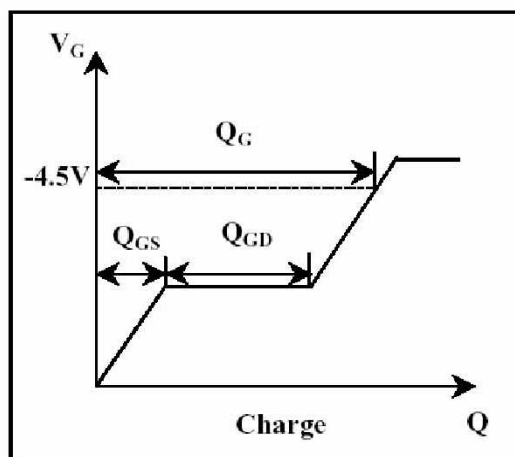


Fig 12. Gate Charge Waveform