

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

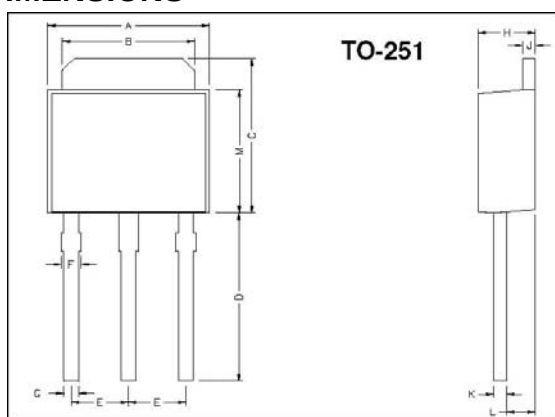
DESCRIPTION

The SID9575 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The through-hole version (TO-251) is available for low-profile applications and suited for low voltage applications such as DC / DC converters.

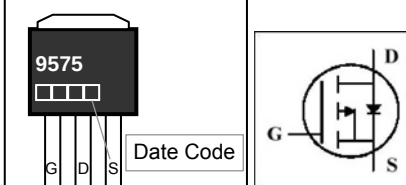
FEATURES

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

PACKAGE DIMENSIONS



MARKING:



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	7.20	7.80	K	0.45	0.60
E	2.30 REF		L	0.90	1.50
F	0.60	0.90	M	5.40	5.80

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	I_D @ $T_C = 25^\circ C$	-15	A
Continuous Drain Current, V_{GS} @ 10V	I_D @ $T_C = 100^\circ C$	-9.5	A
Pulsed Drain Current ¹	I_{DM}	-45	A
Total Power Dissipation	P_D @ $T_C = 25^\circ C$	36	W
Linear Derating Factor		0.29	W / $^\circ C$
Operating Junction & Storage temperature	T_J, T_{STG}	-55~150	$^\circ C$

THERMAL DATA

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-case	$R_{\theta JC}$	3.5	$^\circ C / W$
Thermal Resistance Junction-ambient	$R_{\theta JA}$	110	$^\circ C / W$

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

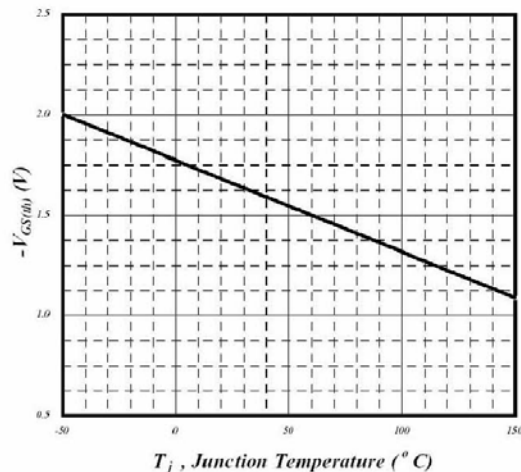
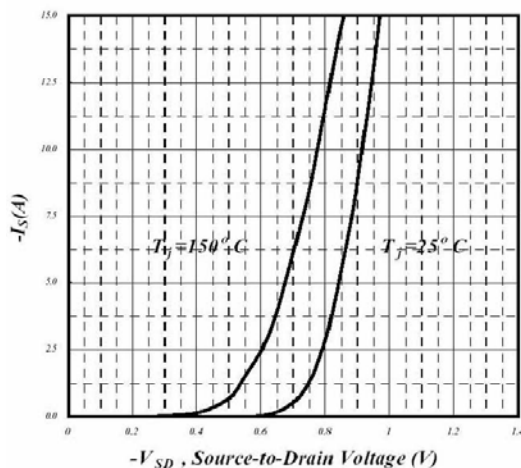
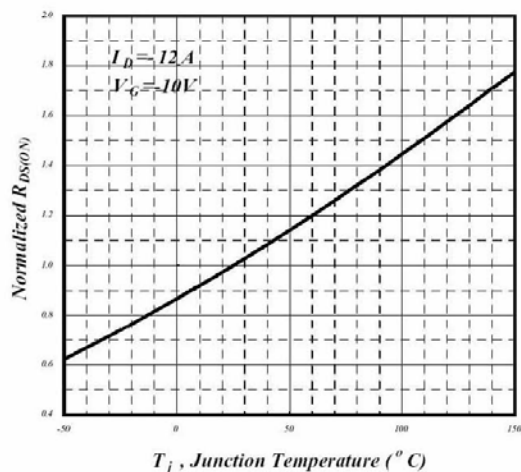
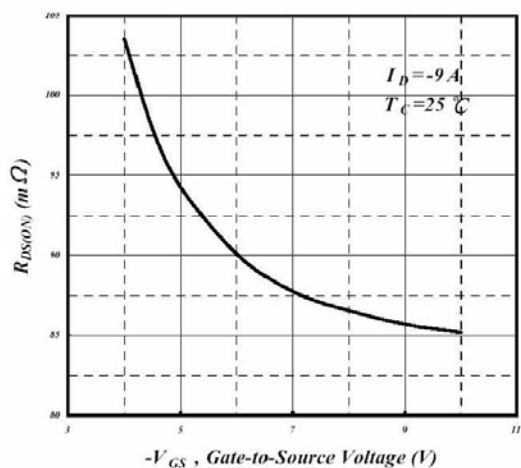
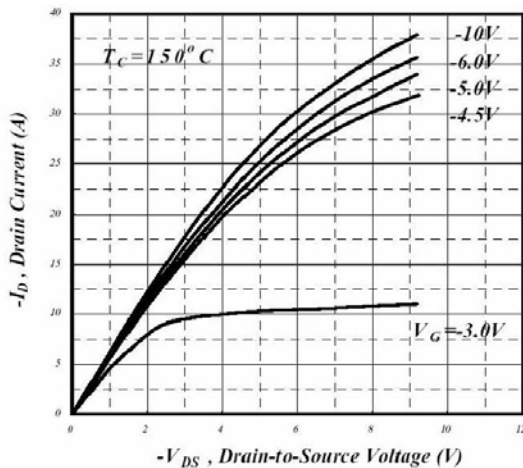
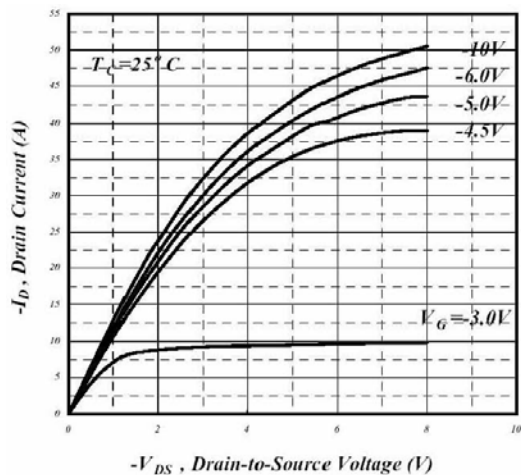
Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	-60	-	-	V	$V_{GS} = 0, I_D = -250 \mu\text{A}$
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	-	-0.06	-	V / $^\circ\text{C}$	Reference to 25°C , $I_D = -1 \text{ mA}$
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	-	-3.0	V	$V_{DS}=V_{GS}, I_D = -250 \mu\text{A}$
Forward Trans-conductance	g_{fs}	-	14	-	S	$V_{DS} = -10\text{V}, I_D = -9\text{A}$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 25\text{V}$
Drain-Source Leakage Current ($T_J=25^\circ\text{C}$)	I_{DSS}	-	-	-1	μA	$V_{DS} = -60 \text{ V}, V_{GS} = 0$
Drain-Source Leakage Current ($T_J=150^\circ\text{C}$)		-	-	-25		$V_{DS} = -48 \text{ V}, V_{GS} = 0$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	90	m Ω	$V_{GS} = -10 \text{ V}, I_D = -12\text{A}$
		-	-	120		$V_{GS} = -4.5 \text{ V}, I_D = -9 \text{ A}$
Total Gate Charge ²	Q_g	-	17	27	nC	$I_D = -9 \text{ A}$ $V_{DS} = -48 \text{ V}$ $V_{GS} = -4.5 \text{ V}$
Gate-Source Charge	Q_{gs}	-	5	-		
Gate-Drain ("Miller") Charge	Q_{gd}	-	6	-		
Turn-on Delay Time ²	$T_{d(on)}$	-	10	-	nS	$V_{DS} = -30 \text{ V}$ $I_D = -9 \text{ A}$ $V_{GS} = -10 \text{ V}$ $R_G = 3.3 \Omega$ $R_D = 3.3 \Omega$
Rise Time	T_r	-	19	-		
Turn-off Delay Time	$T_{d(off)}$	-	46	-		
Fall Time	T_f	-	53	-		
Input Capacitance	C_{iss}	-	1660	2660	pF	$V_{GS} = 0 \text{ V}$ $V_{DS} = -25 \text{ V}$ $f = 1.0 \text{ MHz}$
Output Capacitance	C_{oss}	-	160	-		
Reverse Transfer Capacitance	C_{rss}	-	100	-		

SOURCE-DRAIN DIODE

Parameter	Symbol	Min	Typ	Max	Unit	Test Conditions
Forward On Voltage ²	V_{SD}	-	-	-1.2	V	$I_S = -9\text{A}, V_{GS} = 0 \text{ V}$
Reverse Recovery Time ²	T_{rr}	-	56	-	ns	$I_S = -9 \text{ A}, V_{GS} = 0\text{V}$
Reverse Recovery Charge	Q_{rr}	-	159	-	nC	$di/dt = 100 \text{ A} / \mu\text{S}$

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

CHARACTERISTIC CURVES



CHARACTERISTIC CURVES (Cont'd)

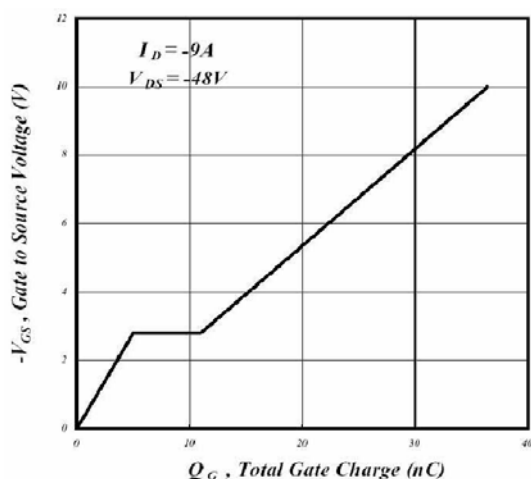


Fig 7. Gate Charge Characteristics

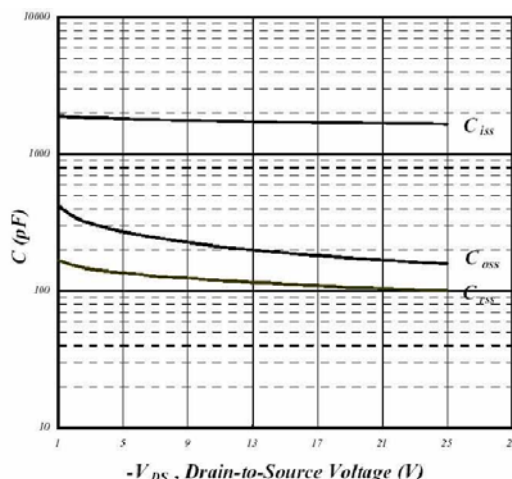


Fig 8. Typical Capacitance Characteristics

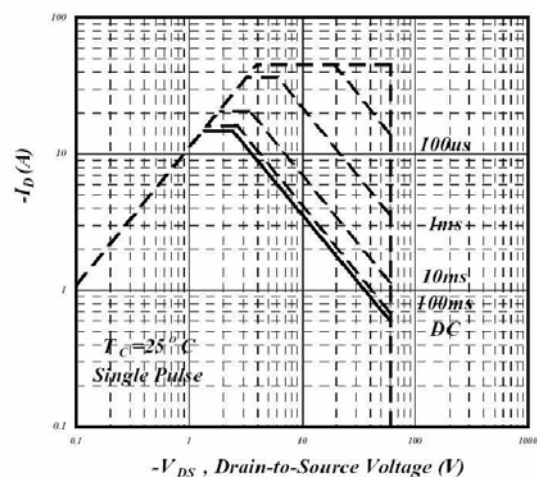


Fig 9. Maximum Safe Operating Area

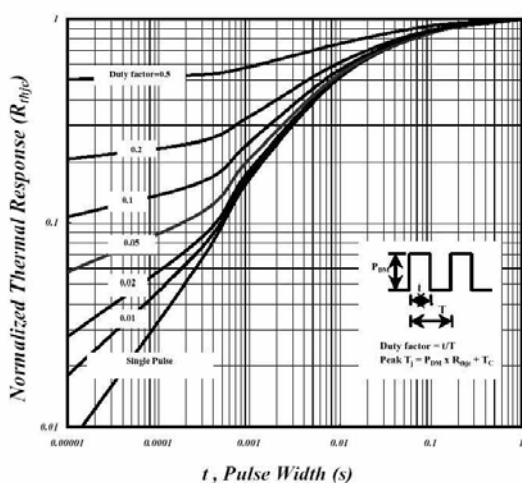


Fig 10. Effective Transient Thermal Impedance

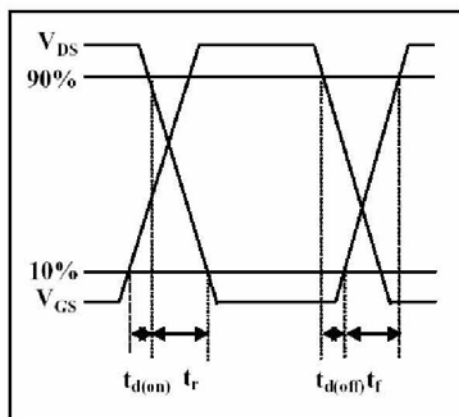


Fig 11. Switching Time Waveform

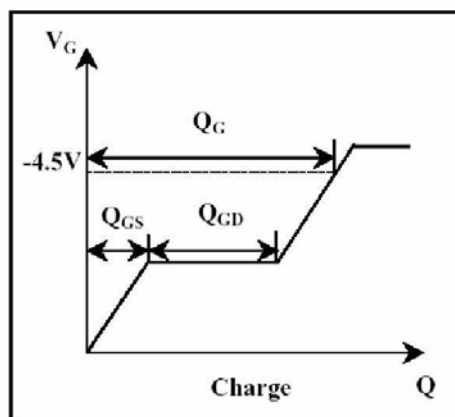


Fig 12. Gate Charge Waveform