

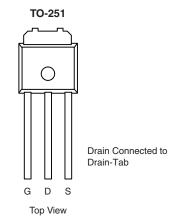
N-Channel 100-V (D-S) MOSFET

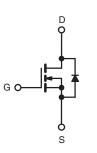
PRODUCT SUMMARY				
V _{DS} (V)	100			
$R_{DS(on)}(\Omega)$	V _{GS} = 10 V 0.20			
Q _g (Max.) (nC)	16			
Q _{gs} (nC)	4.4			
Q _{gd} (nC)	7.7			
Configuration	Single			

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- Available in Tape and Reel
- Dynamic dV/dt Rating
- Repetitive Avalanche Rated
- 175 °C Operating Temperature
- · Fast Switching
- · Ease of Paralleling







N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C	= 25 °C, unl	less otherwis	se noted)			
PARAMETER			SYMBOL	LIMIT	UNIT	
Drain-Source Voltage			V_{DS}	100	V	
Gate-Source Voltage			V_{GS}	± 20	1 V	
Continuous Drain Current	V_{GS} at 10 V $T_{C} = 25 ^{\circ}C$ $T_{C} = 100 ^{\circ}C$		12			
Continuous Drain Current	V _{GS} at 10 V	T _C = 100 °C	I _D	7.5	Α	
Pulsed Drain Current ^a			I _{DM}	37		
Linear Derating Factor				0.40	W/°C	
Linear Derating Factor (PCB Mount)			I	0.025	VV/ C	
Single Pulse Avalanche Energy ^b			E _{AS}	200	mJ	
Avalanche Currenta			I _{AR}	9.2	Α	
Repetitive Avalanche Energy ^a			E _{AR}	6.0	mJ	
Maximum Power Dissipation	T _C =	25 °C	D	60	W	
Maximum Power Dissipation (PCB Mount)	T _A = 25 °C		P_{D}	3.7]	
Peak Diode Recovery dV/dt ^c			dV/dt	5.5	V/ns	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to + 175	°C		
Soldering Recommendations (Peak Temperature)	decommendations (Peak Temperature) For 10 s		Ŭ	300 ^d	7	

- a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11). b. $V_{DD}=25$ V, starting $T_J=25$ °C, L = 3.5 mH, $R_g=25$ Ω , $I_{AS}=9.2$ A (see fig. 12). c. $I_{SD}\leq 9.2$ A, dl/dt ≤ 110 A/µs, $V_{DD}\leq V_{DS}$, $T_J\leq 175$ °C.



THERMAL RESISTANCE RATINGS					
PARAMETER	SYMBOL	TYP.	MAX.	UNIT	
Maximum Junction-to-Ambient	R _{thJA}	-	62		
Maximum Junction-to-Ambient (PCB Mount) ^a	R _{thJA}	-	40	°C/W	
Maximum Junction-to-Case (Drain)	R _{thJC}	-	2.5		

PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0, I _D = 250 μA		100	-	-	V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	Reference	Reference to 25 °C, I _D = 1 mA		0.13	-	V/°C
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} =	= V _{GS} , I _D = 250 μA	1.0	-	3.0	V
Gate-Source Leakage	I _{GSS}		V _{GS} = ± 20 V	-	-	± 100	nA
Zarra Cata Valta da Duaira Comunant		V _{DS} =	V _{DS} = 100 V, V _{GS} = 0 V		-	25	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 80 V	, V _{GS} = 0 V, T _J = 150 °C	-	-	250	μA
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 10 V	I _D = 5.5 A ^b	-	0.20	-	Ω
Forward Transconductance	9 _{fs}	V _{DS} =	= 50 V, I _D = 5.5 A ^b	2.7	-	-	S
Dynamic							
Input Capacitance	C _{iss}		V _{GS} = 0 V,	-	360	-	
Output Capacitance	C _{oss}		$V_{DS} = 25 \text{ V},$	-	150	-	pF
Reverse Transfer Capacitance	C _{rss}	f = 1	.0 MHz, see fig. 5	-	34	-	
Total Gate Charge	Qg			-	-	16	
Gate-Source Charge	Q _{gs}	V _{GS} = 10 V	$V_{GS} = 10 \text{ V}$ $I_{D} = 9.2 \text{ A}, V_{DS} = 80 \text{ V},$ see fig. 6 and 13 ^b		-	4.4	nC
Gate-Drain Charge	Q _{gd}	See lig. 0 and 13		-	-	7.7	
Turn-On Delay Time	t _{d(on)}			-	8.8	-	
Rise Time	t _r	V _{DD} :	= 50 V, I _D = 9.2 A,	-	30	-	ns
Turn-Off Delay Time	t _{d(off)}	$R_g = 18 \Omega$, $R_D = 5.2 \Omega$, see fig. 10^b		-	19	-	ns
Fall Time	t _f			-	20	-	
Internal Drain Inductance	L_D	Between lead, 6 mm (0.25") from package and center of die contact		-	4.5	-	nH
Internal Source Inductance	L _S			-	7.5	-	11111
Drain-Source Body Diode Characteristic	s						
Continuous Source-Drain Diode Current	I _S	MOSFET symbol showing the integral reverse p - n junction diode		-	-	9.2	A
Pulsed Diode Forward Current ^a	I _{SM}			-	-	37	
Body Diode Voltage	V_{SD}	$T_J = 25$ °C, $I_S = 9.2$ A, $V_{GS} = 0$ V ^b		-	-	1.8	V
Body Diode Reverse Recovery Time	t _{rr}	T 05 %C 1	0.0 A 41/4+ 100 A/h	-	110	260	ns
Body Diode Reverse Recovery Charge	Q _{rr}	$T_J = 25 ^{\circ}\text{C}, I_F = 9.2 \text{A}, dI/dt = 100 \text{A/}\mu\text{s}^b$		-	0.53	1.3	μC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-or			ninated b	y L _S and	L _D)

Notes

- a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11). b. Pulse width \leq 300 μs ; duty cycle \leq 2 %.



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

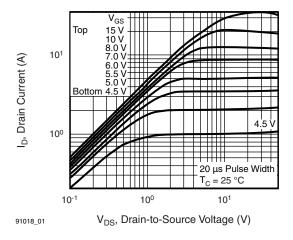


Fig. 1 - Typical Output Characteristics, $T_C = 25$ °C

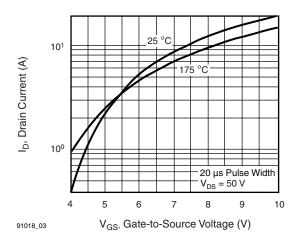


Fig. 3 - Typical Transfer Characteristics

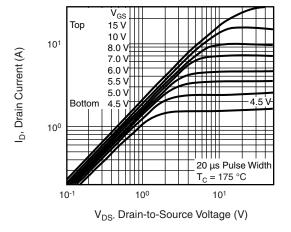


Fig. 2 - Typical Output Characteristics, T_C = 175 $^{\circ}C$

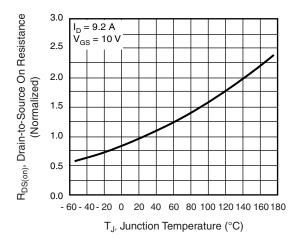
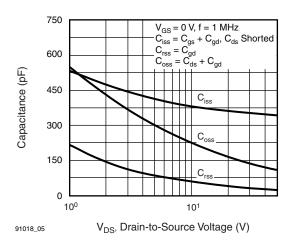
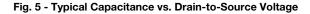


Fig. 4 - Normalized On-Resistance vs. Temperature







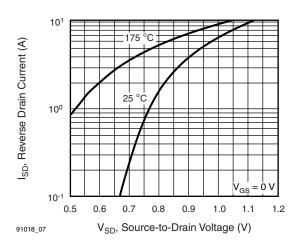


Fig. 7 - Typical Source-Drain Diode Forward Voltage

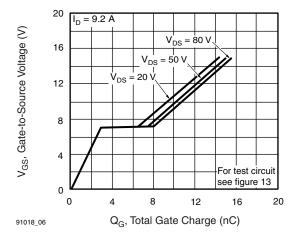


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

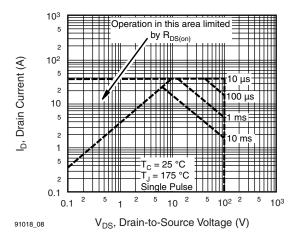


Fig. 8 - Maximum Safe Operating Area



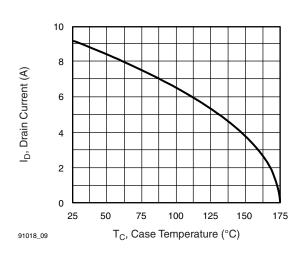


Fig. 9 - Maximum Drain Current vs. Case Temperature

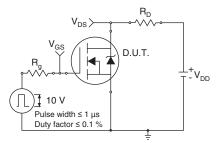


Fig. 10a - Switching Time Test Circuit

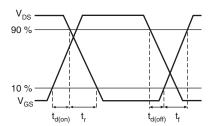


Fig. 10b - Switching Time Waveforms

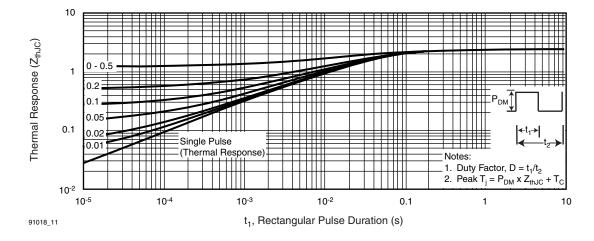


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case



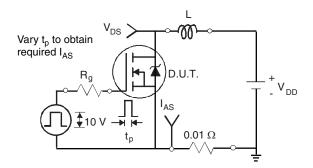


Fig. 12a - Unclamped Inductive Test Circuit

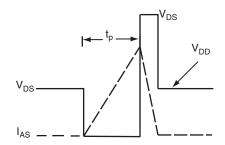


Fig. 12b - Unclamped Inductive Waveforms

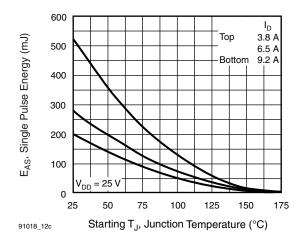


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

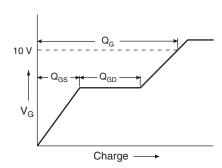


Fig. 13a - Basic Gate Charge Waveform

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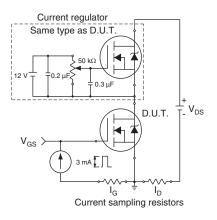
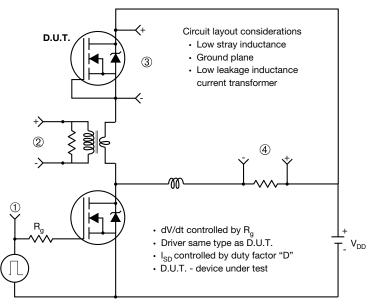


Fig. 13b - Gate Charge Test Circuit



Peak Diode Recovery dV/dt Test Circuit



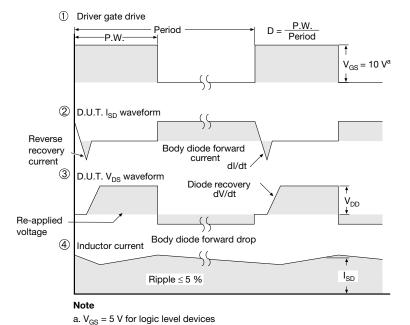
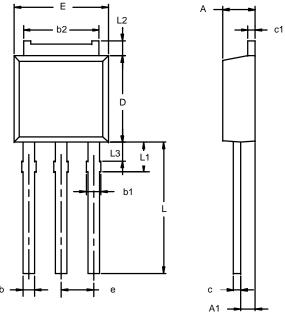


Fig. 14 - For N-Channel



TO-251AA



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Note:	Dimension L3 is for reference only	

	MILLIM	IETERS	INC	HES	
Dim	Min	Max	Min	Max	
Α	2.21	2.38	0.087	0.094	
A1	0.89	1.14	0.035	0.045	
b	0.71	0.89	0.028	0.035	
b1	0.76	1.14	0.030	0.045	
b2	5.23	5.43	0.206	0.214	
С	0.46	0.58	0.018	0.023	
c1	0.46	0.58	0.018	0.023	
D	5.97	6.22	0.235	0.245	
Е	6.48	6.73	0.255	0.265	
е	2.28	BSC	0.090	BSC	
L	3.89	9.53	0.153	0.375	
L1	1.91	2.28	0.075	0.090	
L2	0.89	1.27	0.035	0.050	
L3	1.15	1.52	0.045	0.060	



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