

N-Channel 200 V (D-S) MOSFET

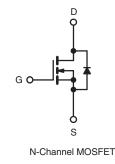
PRODUCT SUMMARY					
V _{DS} (V)	200				
R _{DS(on)} (Ω)	V _{GS} = 10 V	0.265			
Q _g (Max.) (nC)	16				
Q _{gs} (nC)	5				
Q _{gd} (nC)	8				
Configuration	Single				

FEATURES

- · Isolated Package
- High Voltage Isolation = 2.5 kV_{RMS} (t = 60 s; f = 60 Hz)
- Sink to Lead Creepage Distance = 4.8 mm
- 175 °C Operating Temperature
- · Dynamic dV/dt Rating
- Low Thermal Resistance
- Lead (Pb)-free Available







ABSOLUTE MAXIMUM RATINGS T	$C = 25 \ ^{\circ}C$, unless other	wise noted		
PARAMETER	SYMBOL	LIMIT	UNIT	
Drain-Source Voltage	V _{DS}	200	V	
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current	$V_{GS} \text{ at } 10 \text{ V} \qquad \begin{array}{c} T_{C} = 25 \text{ °C} \\ T_{C} = 100 \text{ °C} \end{array}$	I-	10	
	$T_{\rm C} = 100 ^{\circ}{\rm C}$	I D	6.5	A
Pulsed Drain Current ^a	I _{DM}	32		
Linear Derating Factor		0.24	W/°C	
Single Pulse Avalanche Energy ^b	E _{AS}	36	mJ	
Repetitive Avalanche Current ^a	I _{AR}	7.2	А	
Repetitive Avalanche Energy ^a	E _{AR}	3.7	mJ	
Maximum Power Dissipation	T _C = 25 °C	PD	37	W
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)	for 10 s		300 ^d	
Mounting Torque	6-32 or M3 screw		10	lbf ⋅ in
	0-32 OF M3 SCIEW		1.1	N ⋅ m

Notes

a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).

b. $V_{DD} = 25 \text{ V}$, starting $T_J = 25 \text{ °C}$, L = 1.0 mH, $R_G = 25 \Omega$, $I_{AS} = 7.2 \text{ A}$ (see fig. 12). c. $I_{SD} \le 9.2 \text{ A}$, dl/dt $\le 110 \text{ A/}\mu\text{s}$, $V_{DD} \le V_{DS}$, $T_J \le 175 \text{ °C}$.

d. 1.6 mm from case.



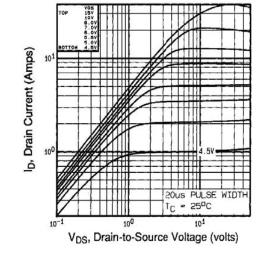
THERMAL RESISTANCE RA	TINGS							
PARAMETER	SYMBOL	TYP. MAX.			UNIT			
Maximum Junction-to-Ambient	R _{thJA}	- 65			2014			
Maximum Junction-to-Case (Drain)	R _{thJC}	- 4.1				°C/W		
SPECIFICATIONS $T_J = 25 \ ^{\circ}C$,	unless otherw	vise noted			0	T		
PARAMETER	SYMBOL	TEST	CONDITI	ONS	MIN.	TYP.	MAX.	UNIT
Static		1				1	•	
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} =	0 V, I _D = 2	50 μΑ	200	-	-	V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	Reference	to 25 °C,	I _D = 1 mA	-	0.13	-	V/°C
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V$	$I_{\rm GS}, I_{\rm D} = 2$	250 μΑ	2.0	-	4.0	V
Gate-Source Leakage	I _{GSS}	$V_{GS} = \pm 20 V$			-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	$V_{DS} = 2$	$V_{DS} = 200 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$		-	-	25	
		V_{DS} =160 V, V_{GS} = 0 V, T_{J} = 150 °C			-	-	250	μΑ
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} = 10 V	I _D	= 4.3 A ^b	-	0.265	-	Ω
Forward Transconductance	g _{fs}	$V_{DS} = 50 \text{ V}, \text{ I}_{D} = 4.3 \text{ A}^{b}$			2.3	-	-	S
Dynamic								
Input Capacitance	C _{iss}	$V_{GS} = 0 V, V_{DS} = 25 V, f = 1.0 MHz, see fig. 5 f = 1.0 MHz$		-	560	-	pF	
Output Capacitance	C _{oss}			-	260	-		
Reverse Transfer Capacitance	C _{rss}			-	110	-		
Drain to Sink Capacitance	С			-	12	-		
Total Gate Charge	Qg				-	-	16	
Gate-Source Charge	Q _{gs}	V _{GS} = 10 V	l _D = 9.2 /	A, V _{DS} = 80 V, g. 6 and 13 ^b	-	-	4.4	nC
Gate-Drain Charge	Q _{gd}		300 IQ	g. o and to	-	-	7.7	
Turn-On Delay Time	t _{d(on)}				-	8.8	-	
Rise Time	t _r			9.2 A,	-	30	-	
Turn-Off Delay Time	t _{d(off)}			-	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	-		
Drain-Source Body Diode Characteristic	cs							
Continuous Source-Drain Diode Current	I _S	MOSFET symbol showing the integral reverse p - n junction diode		-	10	-	A	
Pulsed Diode Forward Current ^a	I _{SM}			-	32	-		
Body Diode Voltage	V _{SD}	T _J = 25 °C,	_S = 7.2 A,	$V_{GS} = 0 V^{b}$	-	-	2.5	V
Body Diode Reverse Recovery Time	t _{rr}	$T_{J} = 25 \text{ °C}, I_{F} = 9.2 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}^{b}$		dt - 100 A/uch	-	130	260	ns
Body Diode Reverse Recovery Charge	Q _{rr}			-	0.65	1.3	μC	
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S and L_D)					_D)	

Notes

a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).

b. Pulse width \leq 300 $\mu s;$ duty cycle \leq 2 %.





TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



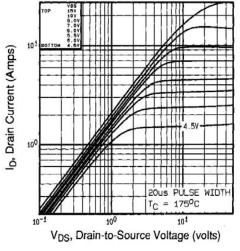


Fig. 2 - Typical Output Characteristics, T_C = 175 $^\circ C$

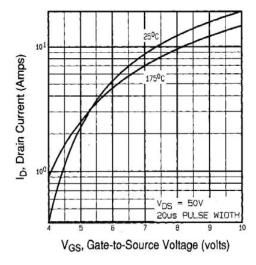


Fig. 3 - Typical Transfer Characteristics

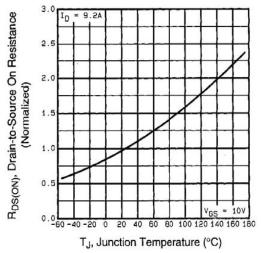


Fig. 4 - Normalized On-Resistance vs. Temperature



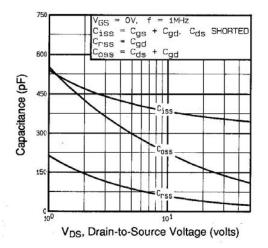


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

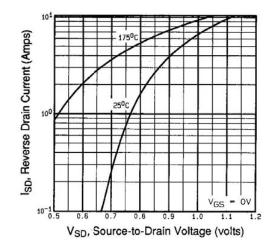


Fig. 7 - Typical Source-Drain Diode Forward Voltage

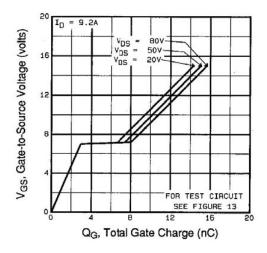


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

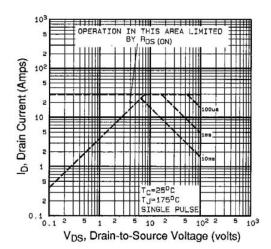


Fig. 5 - Fig. 8 - Maximum Safe Operating Area



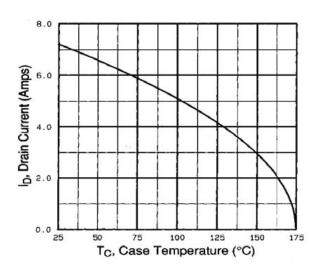


Fig. 9 - Maximum Drain Current vs. Case Temperature

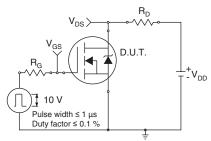


Fig. 10a - Switching Time Test Circuit

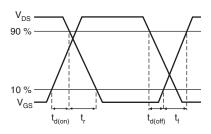
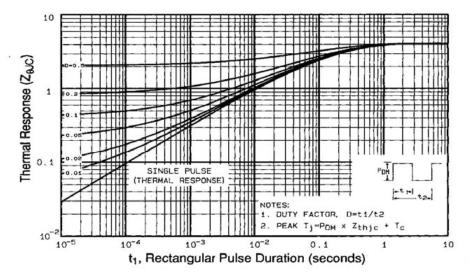


Fig. 10b - Switching Time Waveforms





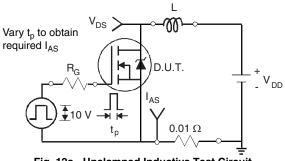


Fig. 12a - Unclamped Inductive Test Circuit

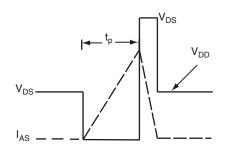
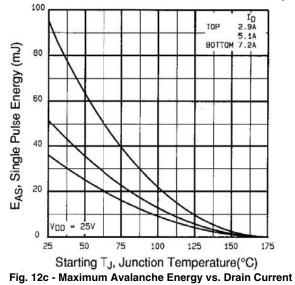


Fig. 12b - Unclamped Inductive Waveforms







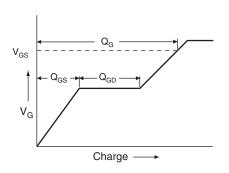
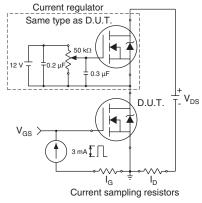
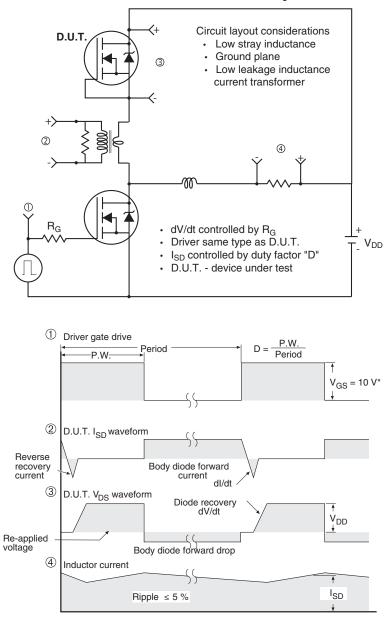


Fig. 13a - Basic Gate Charge Waveform









Peak Diode Recovery dV/dt Test Circuit

* V_{GS} = 5 V for logic level devices

Fig. 14 - For N-Channel



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