Onsemi

• This Device is Halide Free and RoHS Compliant with Exemption 7a, Pb Free 2LI (on second level interconnection)

Applications

• SMPS, Solar Inverters, UPS, Energy Storages, EV Charging Infrastructure

Parameter	Symbol	Value	Unit	
Drain-to-Source Voltage	V _{DSS}	650	V	
Gate-to-Source Voltage	V _{GS}	-8/+22	V	
Continuous Drain Current	T _C = 25°C	I _D	70	А
Power Dissipation		PD	263	W
Continuous Drain Current	T _C = 100°C	I _D	49	А
Power Dissipation		PD	131	W

MAXIMUM RATINGS (T_J = 25° C unless otherwise noted)

THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case (Note 3)	R_{\thetaJC}	0.57	°C/W
Thermal Resistance, Junction-to-Ambient (Note 3)	R_{\thetaJA}	40	

3. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Unit
Operation Values of Gate-to-Source Voltage	V _{GSop}	-53 +18	V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

ELECTRICAL CHARACTERISTICS (T_J = 25° C unless otherwise specified)

Parameter	Parameter Symbol Test Conditions		Min	Тур	Max	Unit		
OFF CHARACTERISTICS								
Drain-to-Source Breakdown Voltage	V _{(BR)DSS}	V_{GS} = 0 V, I_D = 1 mA, T_J = 25°C	650	-	-	V		
Drain-to-Source Breakdown Voltage Temperature Coefficient	$\Delta V_{(BR)DSS}/ \Delta T_J$	$I_D = 1 \text{ mA}$, Referenced to 25°C	_	89	-	mV/°C		
Zero Gate Voltage Drain Current	I _{DSS}	$V_{DS} = 650 \text{ V}, \text{ T}_{J} = 25^{\circ}\text{C}$	-	-	10	μΑ		
		$V_{DS} = 650 \text{ V}, \text{ T}_{J} = 175^{\circ}\text{C} \text{ (Note 5)}$	-	-	500	μΑ		
Gate-to-Source Leakage Current	I _{GSS}	$V_{GS} = -8/+22 \text{ V}, V_{DS} = 0 \text{ V}$	-	-	±1.0	μΑ		
ON CHARACTERISTICS								
Drain-to-Source On Resistance	R _{DS(on)}	V_{GS} = 18 V, I _D = 20 A, T _J = 25°C	-	23	33	mΩ		
		$V_{GS} = 18 \text{ V}, \text{ I}_{D} = 20 \text{ A}, \text{ T}_{J} = 175^{\circ}\text{C}$ (Note 5)	_	35	-			
		V_{GS} = 15 V, I _D = 20 A, T _J = 25°C	-	29	-			
		V _{GS} = 15 V, I _D = 20 A, T _J = 175°C (Note 5)	-	37	-			
Gate Threshold Voltage	V _{GS(TH)}	$V_{GS} = V_{DS}$, $I_D = 10$ mA, $T_J = 25^{\circ}C$	2	2.8	4	V		
Forward Transconductance	9 _{FS}	g _{FS} V _{DS} = 10 V, I _D = 20 A (Note 5)		14	-	S		
CHARGES, CAPACITANCES & GATE R	ESISTANCE							
Input Capacitance	C _{ISS}	$V_{DS} = 400 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$	-	1952	-	pF		
Output Capacitance	C _{OSS}	(Note 5)	-	153	-			
Reverse Transfer Capacitance	C _{RSS}		-	13	-			
Total Gate Charge	Q _{G(TOT)}	$V_{DD} = 400 \text{ V}, \text{ I}_{D} = 20 \text{ A},$	-	69	-	nC		
Gate-to-Source Charge	Q _{GS}	V _{GS} = -3/18 V (Note 5)	-	19	-			
Gate-to-Drain Charge	Q _{GD}		-	18	-	1		
Gate Resistance	R _G	f = 1 MHz	-	4.0	-	Ω		
SWITCHING CHARACTERISTICS								

Turn-On Delay Time

t_{d(ON)}

 $V_{GS} = -3/18 = V$

ELECTRICAL CHARACTERISTICS (T_J = 25° C unless otherwise specified) (continued)

t_{RR}

Parameter	Symbol	Test Conditions	Min	Тур	Max	Unit		
SWITCHING CHARACTERISTICS								
Turn-On Delay Time	t _{d(ON)}	$V_{GS} = -3/18 \text{ V}, V_{DD} = 400 \text{ V},$	_	11	-	ns		
Turn–Off Delay Time	t _{d(OFF)}	$I_D = 20 \text{ A}, R_G = 4.7 \Omega, I_J = 175^{\circ}\text{C}$ (Notes 4 and 5)	-	45	-			
Rise Time	t _r		-	29	-			
Fall Time	t _f		-	14	-			
Turn–On Switching Loss	E _{ON}		-	173	-	μJ		
Turn–Off Switching Loss	E _{OFF}		-	64	-			
Total Switching Loss	E _{TOT}		-	237	-			
SOURCE-TO-DRAIN DIODE CHARACTERISTICS								
Forward Diode Voltage	V _{SD}	I_{SD} = 20 A, V_{GS} = -3 V, T_J = 25°C	-	4.5	6.0	V		
		I _{SD} = 20 A, V _{GS} = -3 V, T _J = 175°C (Note 5)	-	4.2	-			

Reverse Recovery Time

 $\begin{array}{l} V_{GS} = -3 \,\, V\!, \, I_S = 20 \,\, A\!, \\ dI/dt = 1000 \,\, A\!/\mu s\!, \, V_{D.2079} \,\, 530.64584 \,\, 539.547aA\!, \\ \cdot 8(\,\, (I)\text{Tj6}.6403 \,\, 4 \,\, \text{and} \,\, 5))\text{TTD-}0.5685 \,\, \text{Tm}0 \,\, \text{Tc}(J)\text{Tf6}1 \,\, \text{T} \,\, 53(\text{GS8T1} \,\, 1 \,\, \text{T34} \,\, \text{Tm} \cdot 0027 \,\, \text{Tc} 159 \,\, \text{74ET}(\,\, \text{Tj} 1 \,\, \text{Tf} 2.2394 \,\, 0 \,\, \text{TD} \,\, 1) \\ \end{array}$

TYPICAL CHARACTERISTICS

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TYPICAL CHARACTERISTICS





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