

General Description

This MOSFET uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 4.5V. This device is suitable for use as a wide variety of applications.

Features

- Low gate charge
- High power and current handling capability
- Lead free product is acquired



Applications

- PWM applications
- Power management
- Load switch

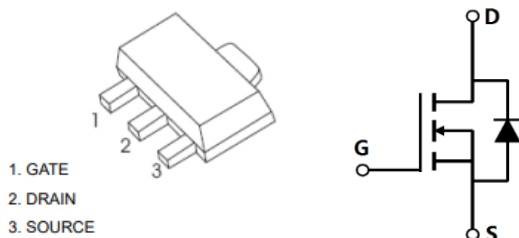
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	60	V
$R_{DS(ON), max} @ V_{GS}=10V$	80	m Ω

Marking Information

Product Name	Package	Marking
OSH06N80QF	SOT-223	OSH06N80Q

Package & Pin information



Absolute Maximum Ratings at $T_j=25^{\circ}\text{C}$ unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	3	A
Pulsed Drain Current ¹⁾	$I_{D,pulse}$	12	A
Power Dissipation	P_D	1.7	W
Single pulsed avalanche energy ²⁾	E_{AS}	12	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-ambient	$R_{\theta JA}$	75	$^{\circ}\text{C/W}$

Electrical Characteristics at $T_j=25^{\circ}\text{C}$ unless otherwise specified

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Drain-source breakdown voltage	BV_{DSS}	60			V	$V_{GS}=0\text{ V}, I_D=250\text{ }\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	1.0		2.5	V	$V_{DS}=V_{GS}, I_D=250\text{ }\mu\text{A}$
Drain-source on-state resistance	$R_{DS(ON)}$		66	80	$\text{m}\Omega$	$V_{GS}=10\text{ V}, I_D=2\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		80	104	$\text{m}\Omega$	$V_{GS}=4.5\text{ V}, I_D=1.5\text{ A}$
Gate-source leakage current	I_{GSS}			± 100	nA	$V_{GS}=\pm 20\text{ V}, V_{DS}=0\text{ V}$
Drain-source leakage current	I_{DSS}			1	μA	$V_{DS}=60\text{ V}, V_{GS}=0\text{ V}$

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		369		pF	$V_{GS}=0\text{ V}$, $V_{DS}=30\text{ V}$, $f=1\text{ MHz}$
Output capacitance	C_{oss}		28		pF	
Reverse transfer capacitance	C_{rss}		22		pF	
Gate resistance	R_g		0.78		Ω	$V_{GS}=0\text{ V}$, $V_{DS}=0\text{ V}$, $f=1.0\text{ MHz}$
Turn-on Delay Time	$t_{d(on)}$		5		ns	$V_{GS}=10\text{ V}$, $V_{DS}=30\text{ V}$, $R_L=15\text{ }\Omega$, $R_{GEN}=3\text{ }\Omega$
Turn-on Rise Time	t_r		8		ns	
Turn-Off Delay Time	$t_{d(off)}$		36		ns	
Turn-Off Fall Time	t_f		21		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total gate charge	Q_g		9.0		nC	$V_{GS}=10\text{ V}$, $V_{DS}=30\text{ V}$, $I_D=2\text{ A}$
Gate-source charge	Q_{gs}		1.6		nC	
Gate-drain charge	Q_{gd}		2.0		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			3	A	$T_A=25^\circ\text{C}$
Diode forward voltage ²⁾	V_{SD}			1.2	V	$I_S=2\text{ A}$, $V_{GS}=0\text{ V}$
Reverse Recovery Time	t_{rr}		20		ns	$I_F=2\text{ A}$, $di/dt=100\text{ A/us}$
Reverse Recovery Charge	Q_{rr}		8		nC	

Note: 1) Pulse width limited by maximum allowable junction temperature.

2) EAS condition: $T_J=25^\circ\text{C}$, $V_{DD}=40\text{ V}$, $V_G=10\text{ V}$, $R_g=25\text{ }\Omega$, $L=0.5\text{ mH}$.

3) Repetitive Rating: Pulse width limited by maximum junction temperature.

Electrical Characteristics Diagrams

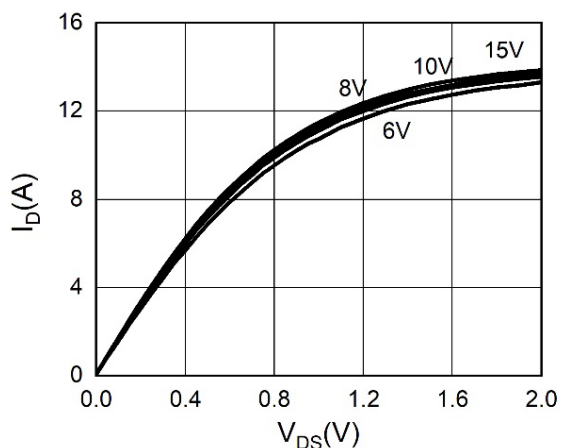


Figure 1. Typ. output characteristics

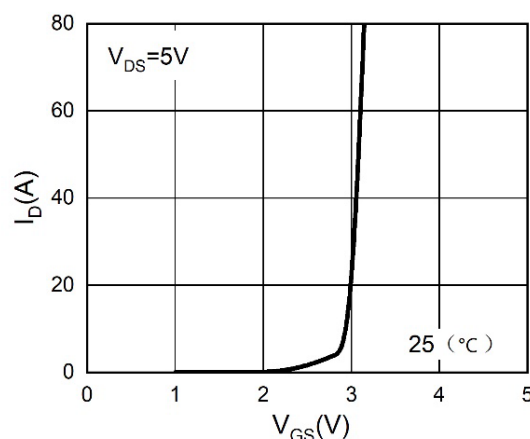


Figure 2. Typ. transfer characteristics

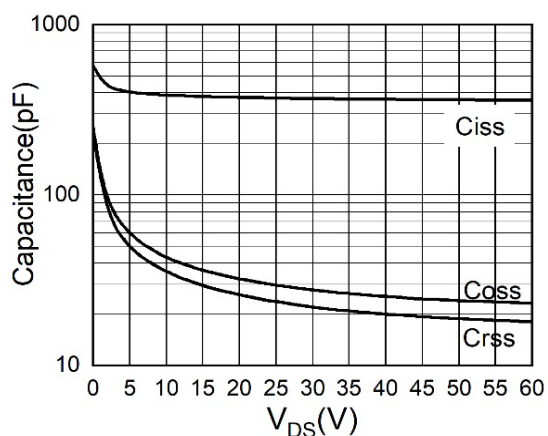


Figure 3. Capacitance

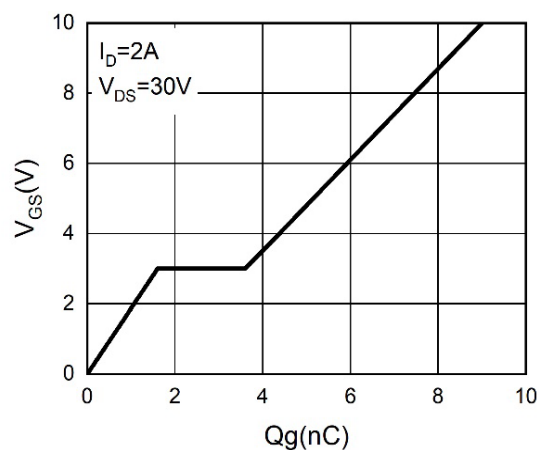


Figure 4. Gate charge

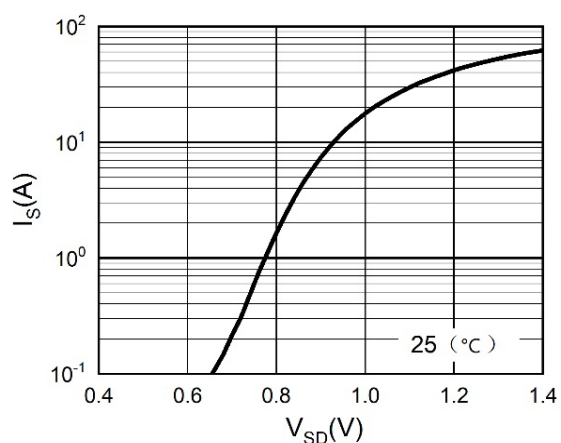


Figure 5. Body-diode characteristics

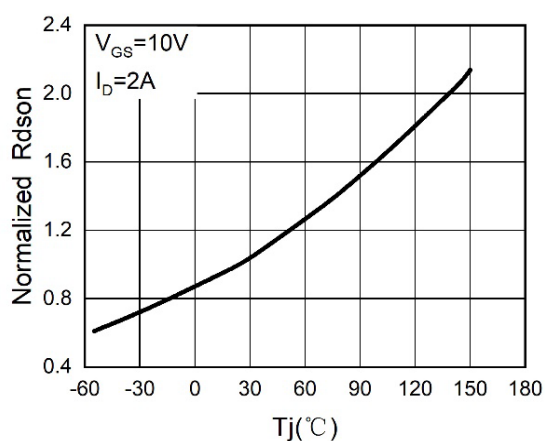
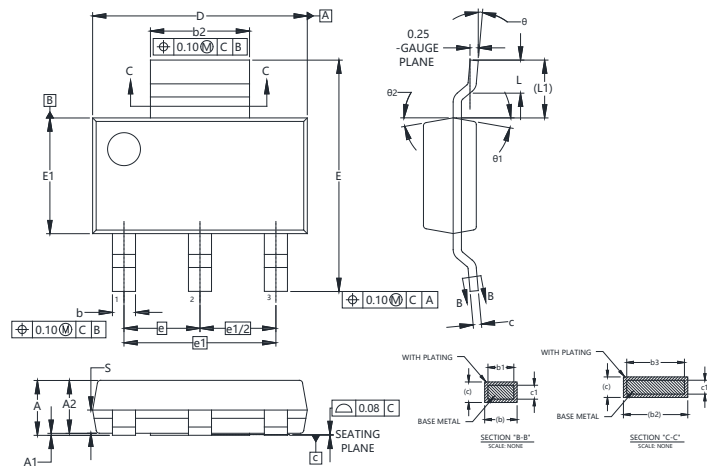


Figure 6. $R_{DS(ON)}$ vs junction temperature

Package Information



DIM	mm		DIM	mm	
	Min	Max		Min	Max
A	1.520	1.800	e	2.30BSC	
A1	0.020	0.100	e1	4.60BSC	
A2	1.500	1.700	L	0.900	1.100
b	0.600	0.800	L1	1.75 REF	
b1	0.600	0.780	S	0.70 REF	
b2	2.950	3.100	θ	0°	10°
b3	2.950	3.050	θ1	10° REF	
c	0.240	0.320	θ2	10° REF	
c1	0.240	0.300	E	6.700	7.300
D	6.300	6.700	E1	3.300	3.700

NOTES:

- 1.0 DIMENSIONING & TOLERANCEING CONFIRM TO ASME Y14.5M-1994.
- 2.0 ALL DIMENSIONS ARE IN MILLIMETERS. ANGLES ARE IN DEGREES.
- 3.0 DIMENSIONS "D" AND "E1" DO NOT INCLUDE MOLD PROTRUSION.
- 4.0 RADIUS ON TERMINAL IS OPTIONAL.
- 5.0 LEAD COPLANARITY MAX. 0.1mm.

Version: SOT-223-V package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
SOT-223	4000	1	4000	5	20000

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