

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
- 100% UIS tested, 100% DVDS tested
- High power and current handing capability
- Lead free product is acquired

Applications

- DC/DC Converter
- Power management switches



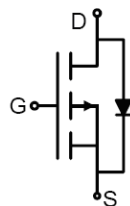
Key Performance Parameters

Parameter	Value	Unit
V_{DS}	-100	V
$R_{DS(ON), max} @ V_{GS} = -10V$	50	m Ω

Marking Information

Product Name	Package	Marking
OSH10P50KF	TO-263	OSH10P50K

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}	-100	V
Gate-source voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	-29	A
Pulsed Drain Current ¹⁾	$I_{D,pulse}$	-116	A
Power Dissipation	P_D	92	W
Single pulsed avalanche energy ²⁾	E_{AS}	361	mJ
Operation and storage temperature	T_{stg}, T_j	-55 to 150	$^{\circ}\text{C}$

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal resistance, junction-to-case	$R_{\theta JC}$	1.35	$^{\circ}\text{C/W}$

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}	-100			V	$V_{GS}=0\text{ V}, I_D=-250\text{ }\mu\text{A}$
Gate threshold voltage	$V_{GS(th)}$	-1.0	-1.8	-2.5	V	$V_{DS}=V_{GS}, I_D=-250\text{ }\mu\text{A}$
Drain-source on-state resistance	$R_{DS(ON)}$		40	50	$\text{m}\Omega$	$V_{GS}=-10\text{ V}, I_D=-15\text{ A}$
Drain-source on-state resistance	$R_{DS(ON)}$		42	56	$\text{m}\Omega$	$V_{GS}=-4.5\text{ V}, I_D=-10\text{ A}$
Gate-source leakage current	I_{GSS}			100	nA	$V_{GS}=20\text{ V}, V_{DS}=0\text{ V}$
				-100		$V_{GS}=-20\text{ V}, V_{DS}=0\text{ V}$
Drain-source leakage current	I_{DSS}			-1	μA	$V_{DS}=-100\text{ V}, V_{GS}=0\text{ V}$

Dynamic Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Input capacitance	C_{iss}		8056		pF	$V_{GS}=0\text{ V}$, $V_{DS}=-10\text{ V}$, $f=1.0\text{ MHz}$
Output capacitance	C_{oss}		195		pF	
Reverse transfer capacitance	C_{rss}		70		pF	
Turn-on Delay Time	$t_{d(on)}$		13		ns	$V_{GS}=-10\text{ V}$, $V_{DS}=-50\text{ V}$, $R_L=3\ \Omega$, $R_{GEN}=3\ \Omega$
Turn-on Rise Time	t_r		64		ns	
Turn-Off Delay Time	$t_{d(off)}$		36		ns	
Turn-Off Fall Time	t_f		52		ns	

Gate Charge Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Total Gate Charge	Q_g		147		nC	$V_{GS}=-10\text{ V}$, $V_{DS}=-50\text{ V}$, $I_D=-15\text{ A}$
Gate-Source Charge	Q_{gs}		17		nC	
Gate-Drain Charge	Q_{gd}		31		nC	

Body Diode Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition
Source drain current (Body Diode)	I_{SD}			-30	A	$T_A=25^\circ\text{C}$
Diode forward voltage ³⁾	V_{SD}			-1.2	V	$I_S=-15\text{ A}$, $V_{GS}=0\text{ V}$
Reverse Recovery Time	t_{rr}		70		ns	$I_F=-15\text{ A}$, $di/dt=100\text{ A/us}$
Reverse Recovery Charge	Q_{rr}		120		nC	

Note: 1) Pulse width limited by maximum allowable junction temperature.
 2) EAS condition: $T_J=25^\circ\text{C}$, $V_{DD}=-50\text{V}$, $V_G=-10\text{V}$, $R_g=25\ \Omega$, $L=0.5\text{mH}$.
 3) Repetitive Rating: Pulse width limited by maximum junction temperature.

Electrical Characteristics Diagrams

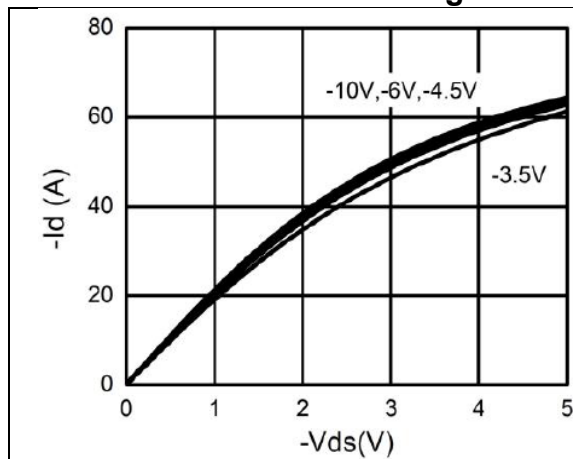


Figure 1. Typ. output characteristics

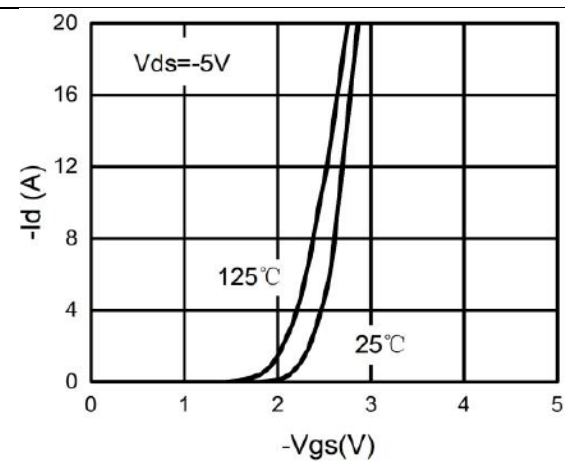


Figure 2. Typ. transfer characteristics

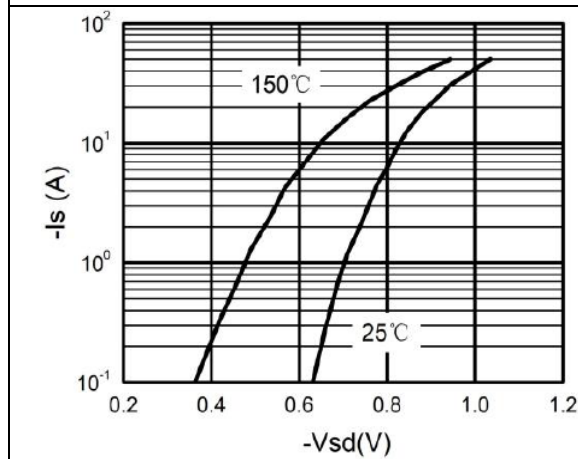


Figure 3. Body-diode characteristics

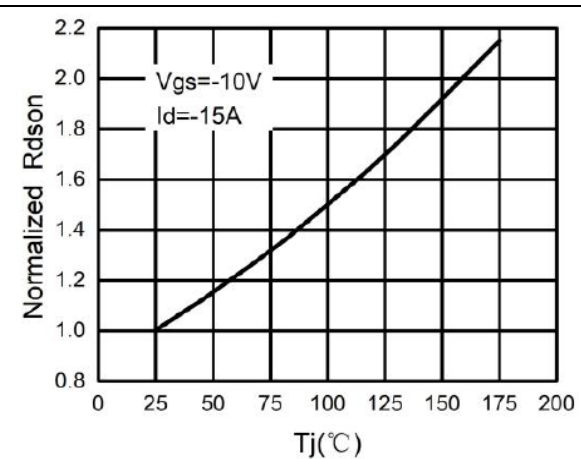


Figure 4. $R_{DS(on)}$ vs junction temperature

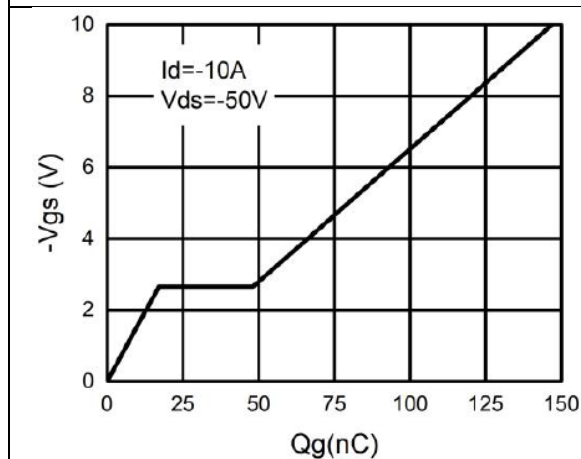


Figure 5. Gate charge waveforms

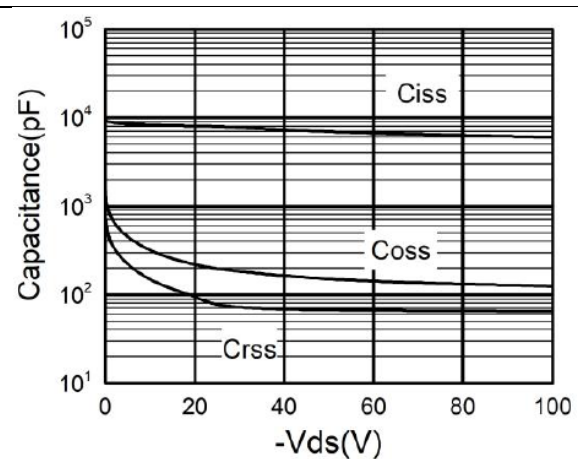
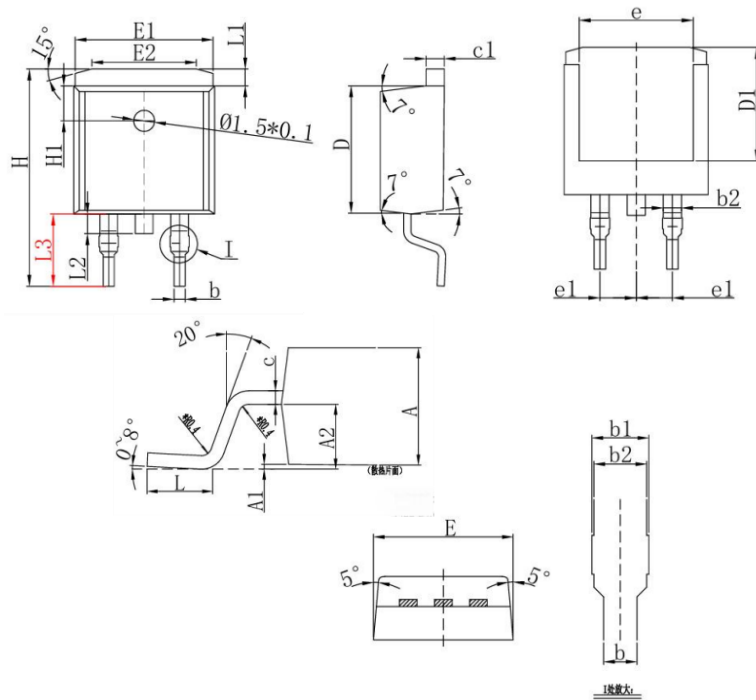


Figure 6. Capacitance

Package Information



Symbol	mm		
	Min.	Typ.	Max.
A	4.52	4.57	4.62
A1	0.02	0.12	0.22
A2	2.34	2.50	2.67
b	0.75	0.80	0.85
b1	1.27	1.37	1.47
b2	1.27	1.27	1.37
c	0.50	0.52	0.54
c1	1.28	1.30	1.32
D	9.10	9.15	9.20
D1	7.90	8.00	8.10
E	10.00	10.10	10.20
E1	9.85	9.88	9.91
E2	7.40	7.50	7.60
e	7.90	8.00	8.10
e1	2.51	2.54	2.57
H	15.30	15.50	15.70
H1	2.40	2.50	2.60
L	2.40	2.70	3.00
L1	1.10	1.20	1.30
L2	1.20	1.45	1.70
L3	4.85	5.15	5.45

Version1: TO-263-G package outline dimension

Ordering Information

Package Type	Units/ Reel	Reels/ Inner Box	Units/ Inner Box	Inner Boxes/ Carton Box	Units/ Carton Box
TO-263-G	5000	2	10000	6	60000

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