

N-Channel 40-V (D-S) MOSFET

FEATURES

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

Application

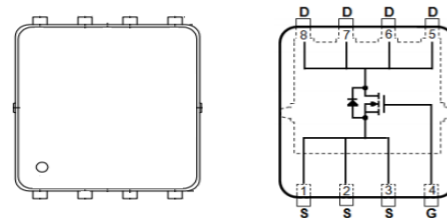
- Portable Devices
- Consumer Electronics

Mechanical

- Case: DFN5060 Package

PRODUCTY SUMMARY		
V_{DS}	$R_{DS(on)}$ m(Ω) Max	
40	4.8	@ $V_{GS}=10V$
	8.7	@ $V_{GS}=4.5V$

DFN5060



Packing Information

Package	Packing
DFN5060	3K/13" Reel

Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹⁾	I_{DSM}	20	A
Continuous Drain Current ⁴⁾	I_D	80	A
Continuous Drain Current ⁵⁾	I_{DM}	201	A
Maximum Power Dissipation	P_D	6	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$

Typical Thermal Resistance

Parameter	Symbol	Limit	Unit
Junction-to-Ambient Thermal Resistance ³⁾	$R_{\theta JA}$	65	$^\circ\text{C/W}$

Note:

1. Pulse width < 300us, Duty cycle < 2%.
2. Fused current that based on wire numbers and diameter.
3. Guaranteed by design, not subject to production testing.
4. The maximum current rating is package limited.
5. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^\circ\text{C}$.

Electrical Characteristics (T_A = 25°C UNLESS OTHERWISE NOTED)

Characteristics	Symbol	Test Condition	Limits			Unit
			Min	Typ	Max	
Static						
Drain-Source Breakdown Voltage	B _{VDSS}	V _{GS} =0V, I _D =250uA	40	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	1.0	1.8	3.0	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =20.0A	-	4.1	4.8	mΩ
		V _{GS} =4.5V, I _D =20.0A	-	6.1	8.7	mΩ
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	-	-	1.0	uA
GateSource Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA

Dynamic ³⁾

Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =10V, I _D =1.5A	-	36	-	nC
Total Gate Charge	Q _g	V _{DS} =20V, V _{GS} =4.5V, I _D =1.5A (Note 1,2)	-	17	-	nC
Gate-Source Charge	Q _{gs}		-	4	-	nC
Gate-Drain Charge	Q _{gd}		-	8	-	nC
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, F=200kHz	-	2663	-	pF
Output Capacitance	C _{oss}		-	377	-	pF
Reverse Transfer Capacitance	C _{rss}		-	147	-	pF

Switching

Turn-On Delay Time	t _{d(on)}	V _{DD} =20V, R _{load} =10Ω, V _{gen} =10V, R _g =3Ω	-	15	-	ns
Turn-On Rise Time	t _r		-	13	-	ns
Turn-Off Delay Time	t _{d(off)}		-	41	-	ns
Turn-Off Fall Time	t _f		-	10	-	ns

Drain-Source Diode

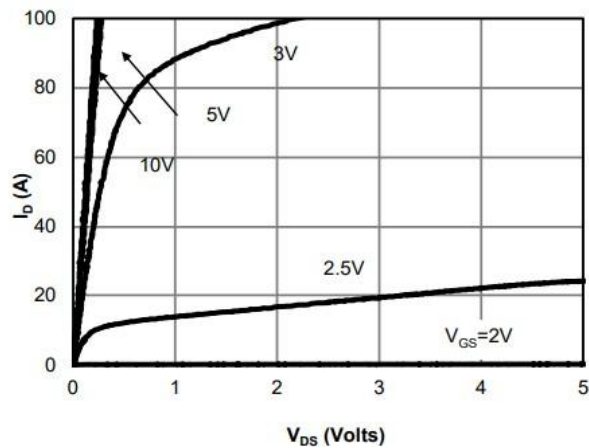
Maximum Continuous Body Diode Forward Current	I _S	-	-	-	1.2	A
Diode Forward Voltage	V _{SD}	I _S =1.0A, V _{GS} =0V	-	-	1.5	V

Note:

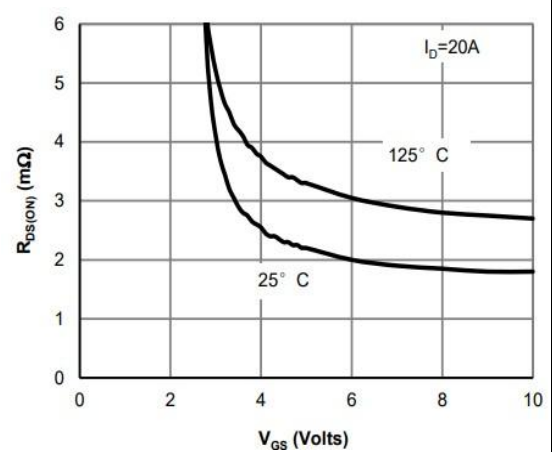
1. Pulse width<300us, Duty cycle<2%.
2. Essentially independent of operating temperature typical characteristics.
3. Repetitive rating, pulse width limited by junction temperature T_{J(MAX)}=150°C. Ratings are based on low frequency and duty cycles to keep initial T_J=25°C.
4. The maximum current rating is package limited.
5. R_{QJA} is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. Mounted on a 1 inch² with 2oz.square pad of copper.
6. Guaranteed by design, not subject to production testing.

Typical Characteristic Curves

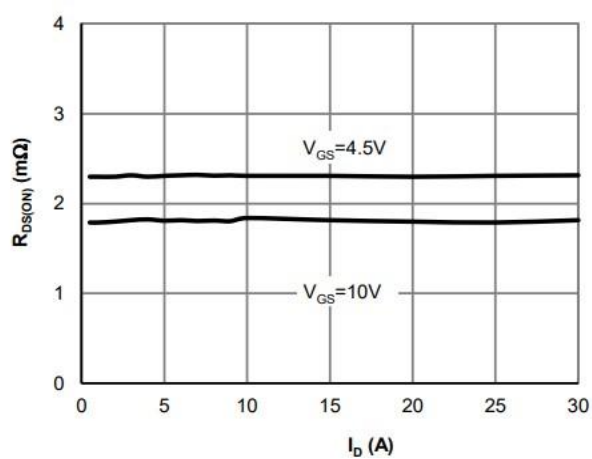
On-Region Characteristics



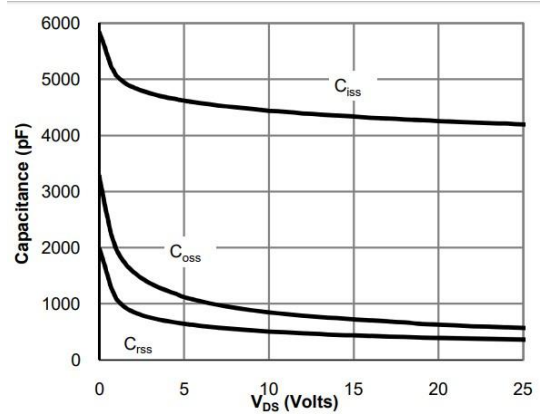
On-Resistance vs. Drain Current



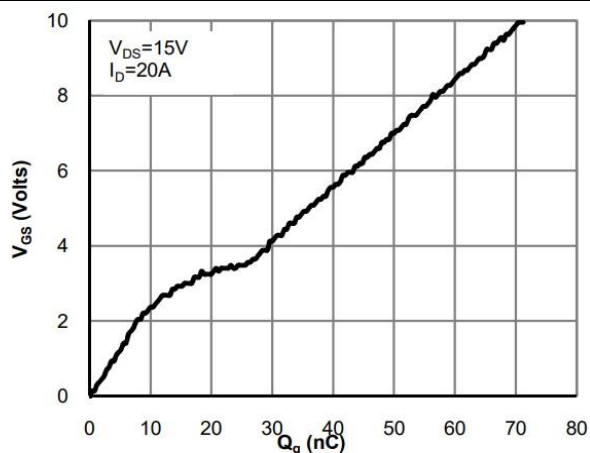
On-Resistance vs. Gate-Source Voltage



Capacitance Characteristics

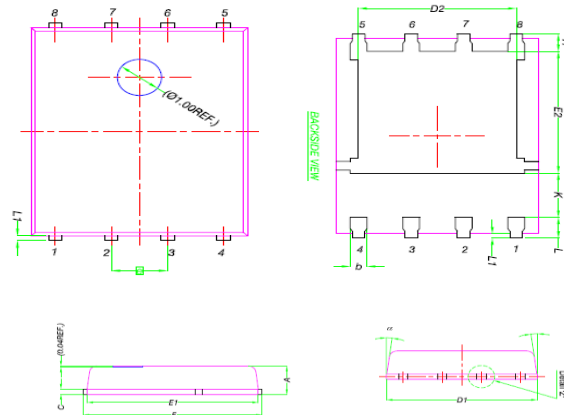


Gate-Charge Characteristics

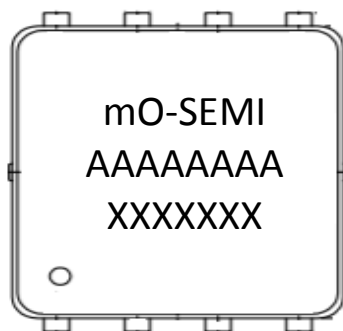


Package Outline Dimensions (inches and millimeters)

DFN5060				
SYMBOL	Dimensions			
	Millimeters		Inches	
	Min	Max	Min	Max
A	0.90	1.10	0.04	0.04
A1	0.00	0.05	0.00	0.00
b	0.33	0.51	0.01	0.02
C	0.20	0.30	0.01	0.01
D1	4.80	5.00	0.19	0.20
D2	3.61	3.96	0.14	0.16
E	5.90	6.10	0.23	0.24
E1	5.70	5.80	0.22	0.23
E2	3.38	3.78	0.13	0.15
e	1.27BSC			
H	0.41	0.61	0.02	0.02
K	1.10	-	0.04	-
L	0.51	0.71	0.02	0.03
L1	0.06	0.20	0.00	0.01
°	0°	12°	0°	12°



Marking Information



First line = Company name

AAAAA = Product number

XXXXXX = Tracking number

Fourth line = Pin1 Point

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