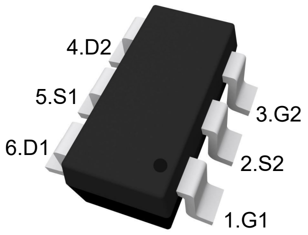
Dual N-Channel Enhancement Mode Power MOSFET

Features

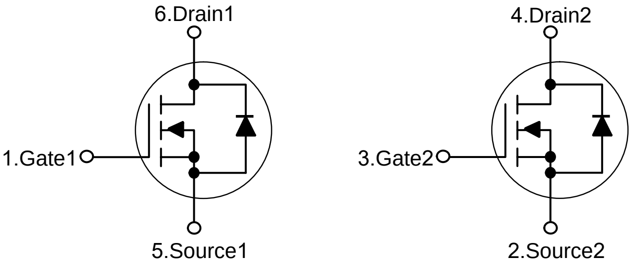
- Excellent $R_{DS(on)}$ and Low Gate Charge
- VDS= 20V,ID= 4A
  RDS(on)< 32mΩ @VGS= 4.5V
- AEC-Q101 qualified (Automotive grade with suffix "Q".)
- Expsemi electronics

SOT-23-6



Marking Code:KQ

Schematic Diagram



Applications

- DC/DC Converter
- Load Switch for Portable Devices

Absolute Maximum Ratings

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	4	A
Drain Current-Pulsed Note1	I_{DM}	10	A
Maximum Power Dissipation	P_D	1.2	W
Junction Temperature	T_J	150	℃
Storage Temperature Range	T_{STG}	-55 to +150	℃

Thermal Characteristics

Thermal Resistance,Junction-to-Ambient Note2	$R_{\theta JA}$	104	°C/W

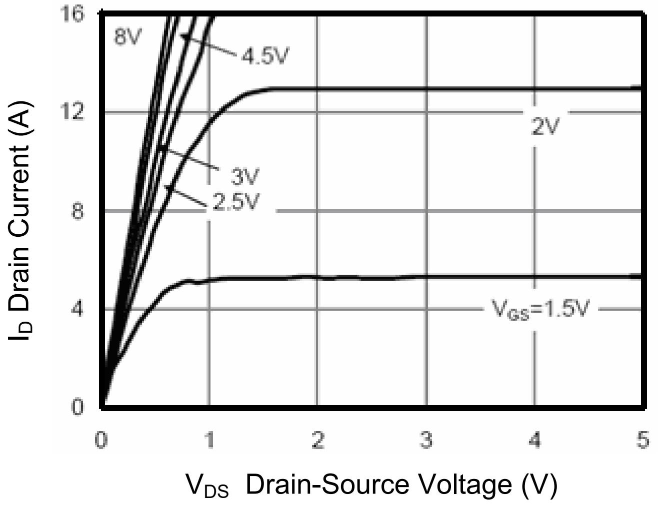
Electrical Characteristics

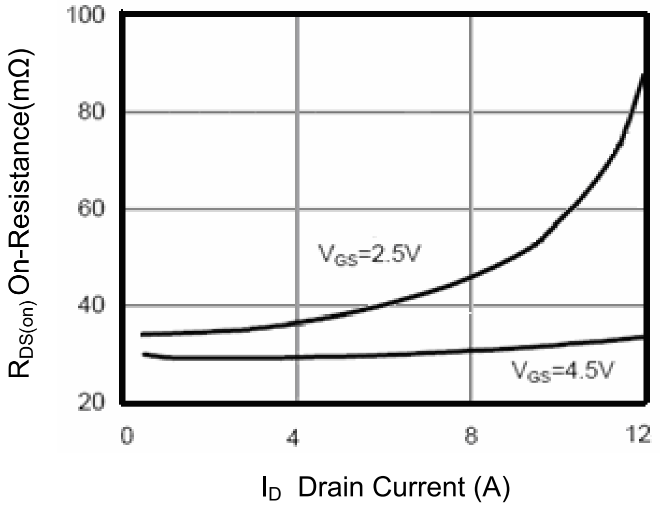
(Ta=25℃ unless otherwise specified)

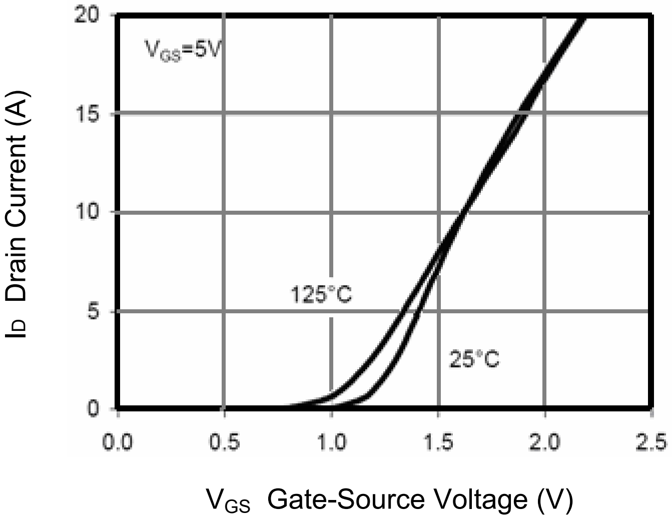
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250μA	20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=20V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note3	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.45	0.7	1	V
Drain-Source On-Resistance Note3	$R_{DS(on)}$	V_{GS}=4.5V, I_D=3A	--	25	32	mΩ
		V_{GS}=2.5V, I_D=2A	--	31	40	mΩ
Forward Transconductance Note3	g_{FS}	V_{DS}=5V,I_D=3A	--	8	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=10V,V_{GS}=0V,f=1MHz	--	260	--	pF
Output Capacitance	C_{oss}		--	48	--	pF
Reverse Transfer Capacitance	C_{rss}		--	27	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=10V, V_{GS}=4.5V R_L=3.3Ω, R_{GEN}=6Ω	--	2.5	--	nS
Turn-on Rise Time	t_r		--	3.2	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	21	--	nS
Turn-off Fall Time	t_f		--	3	--	nS
Total Gate Charge	Q_g	V_{DS} =10V,V_{GS} =4.5V I_D =3A	--	2.9	--	nC
Gate-Source Charge	Q_{gs}		--	0.4	--	nC
Gate-Drain Charge	Q_{gd}		--	0.6	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage Note3	V_{SD}	V_{GS}=0V,I_S=4A	--	--	1.2	V
Diode Forward Current Note2	I_S		--	--	4	A

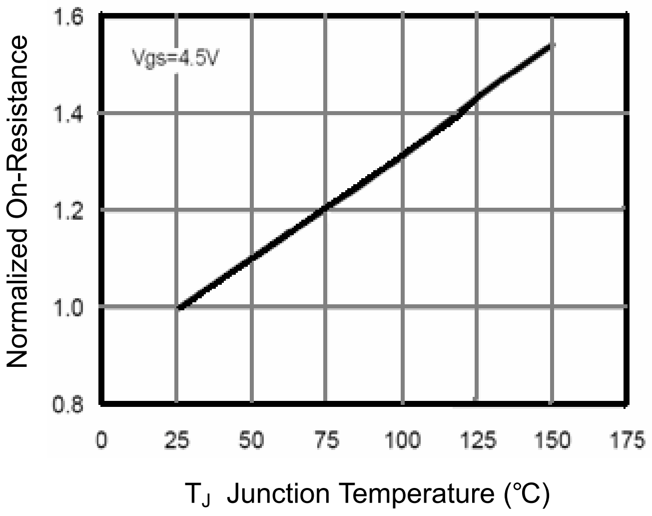
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.Surface Mounted on FR4 Board, t ≤ 10 sec.
3.Pulse Test: Pulse width≤300μs, duty cycle≤2%

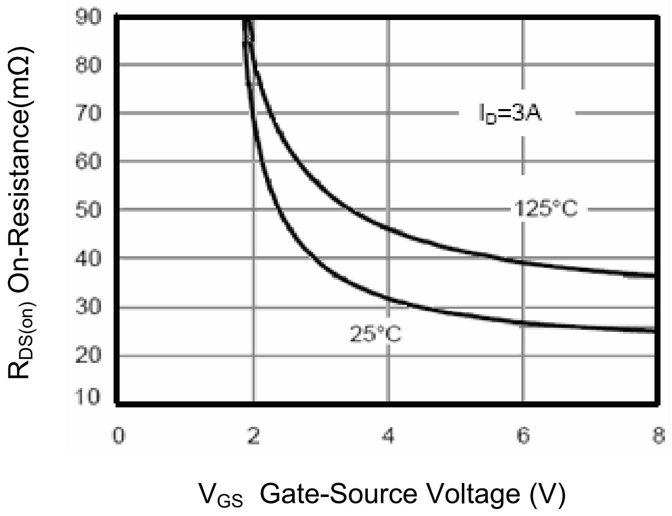
Typical Characteristic Curves

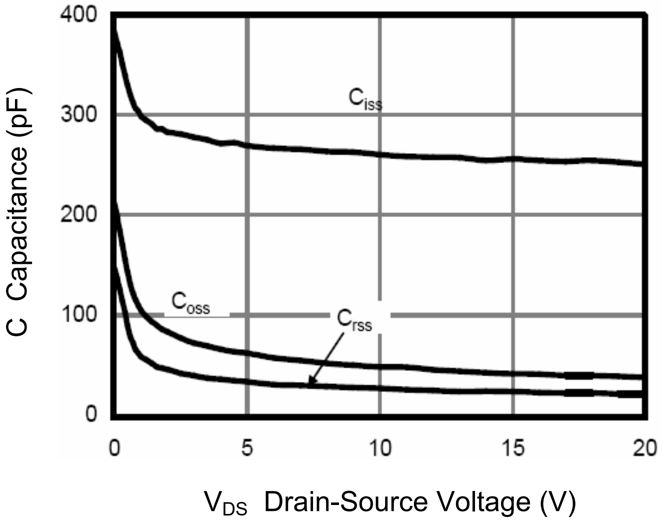


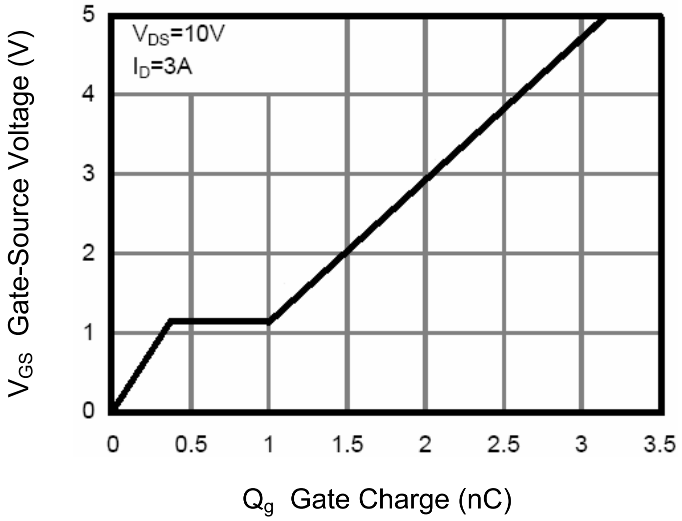


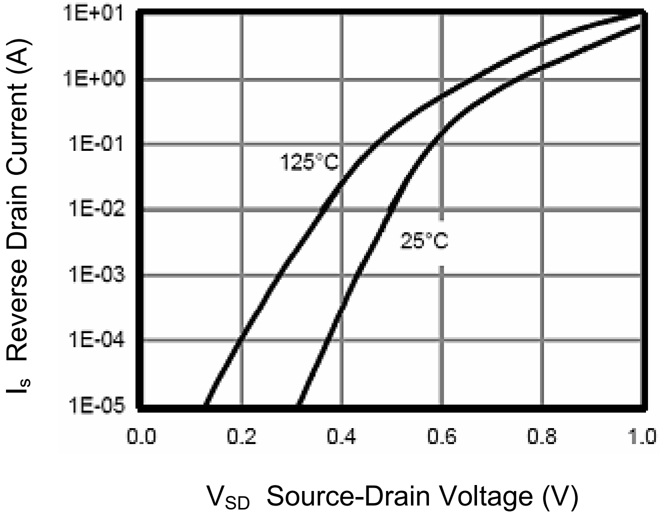








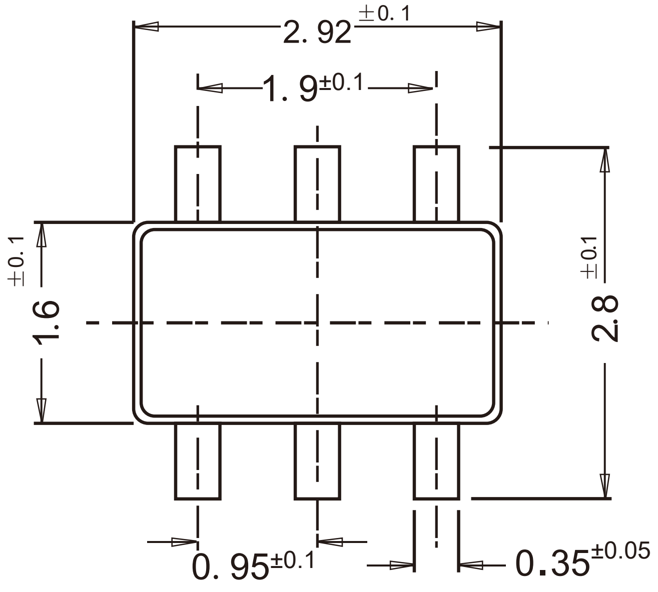

V_{DS}=10V
I_D=3A
V_{GS} Gate-Source Voltage (V)
Q_g Gate Charge (nC)
0
1
2
3
4
5
0
0.5
1
1.5
2
2.5
3
3.5

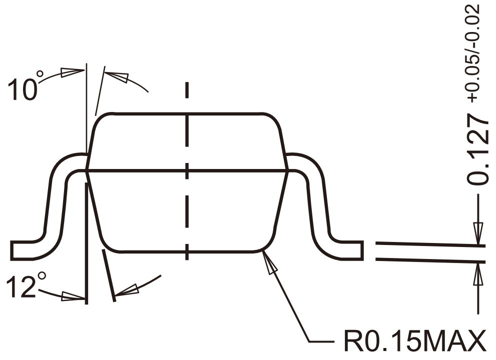

I_S Reverse Drain Current (A)
V_{SD} Source-Drain Voltage (V)
1E+01
1E+00
1E-01
1E-02
1E-03
1E-04
1E-05
0.0
0.2
0.4
0.6
0.8
1.0
125°C
25°C

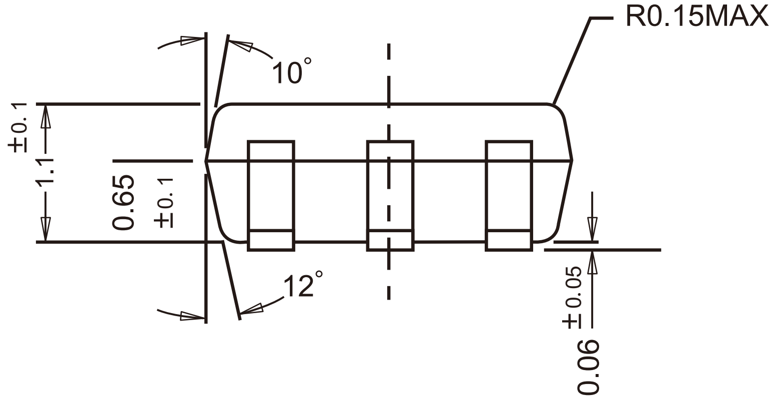
Package Outline

SOT-23-6

Dimensions in mm







Ordering Information

Device	Package	Shipping
EP04DN20	SOT-23-6	3,000PCS/Reel&7inches