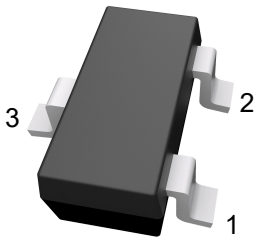
100V N-Channel MOSFET

Features

- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- V_{DS}= 100V,I_D= 6A
  $R_{DS(on)}$< 140mΩ @V_{GS}= 10V
- AEC-Q101 qualified (Automotive grade with suffix "Q".)
- Exsemi technology

SOT-23-3



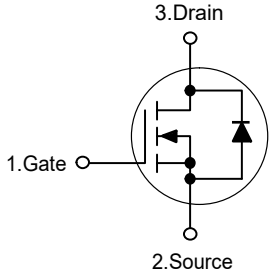
1. Gate 2.Source 3.Drain

Marking Code:0106C

Application

- Power switching application
- Uninterruptible power supply

Schematic Diagram



Absolute Maximum Ratings

Ratings at 25℃ ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	6	A
Drain Current-Pulsed Note1	I_{DM}	20	A
Maximum Power Dissipation	P_D	1.2	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

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

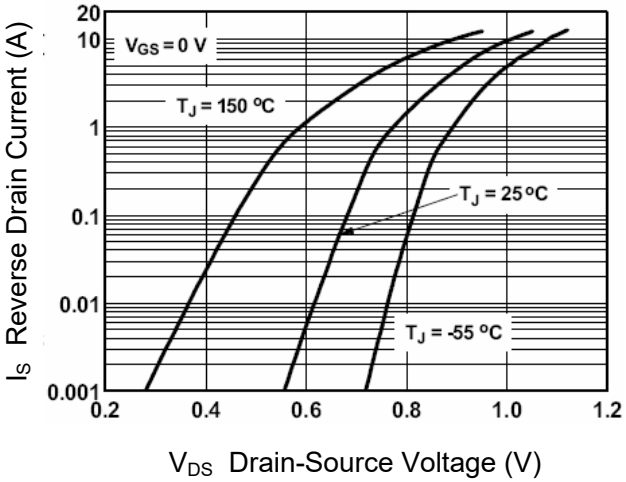
Electrical Characteristics

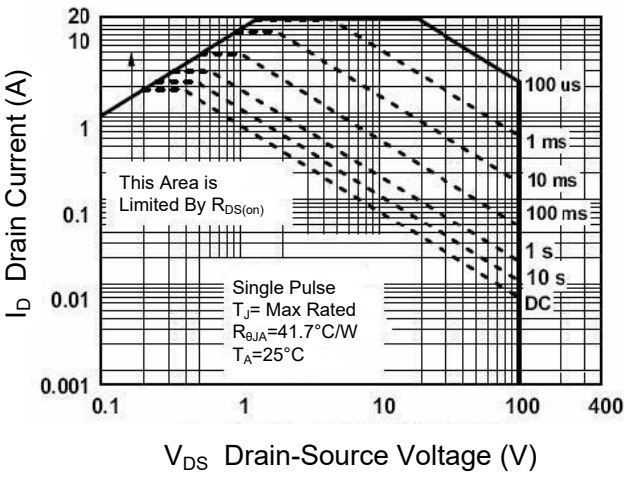
(Ta=25℃ unless otherwise specified)

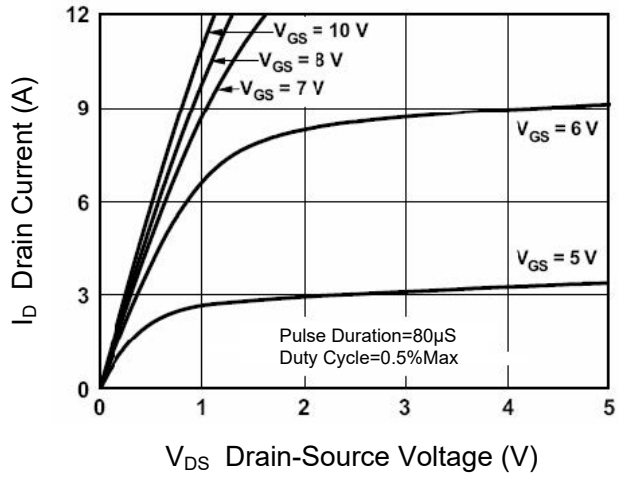
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=100V,V_{GS}=0V	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
Gate Threshold Voltage Note3	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	1.2	--	2.5	V
Drain-Source On-Resistance Note3	$R_{DS(on)}$	V_{GS}=10V,I_D=5A	--	110	140	mΩ
Forward Transconductance Note3	g_{FS}	V_{DS}=5V,I_D=2.9A	--	8	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1MHz	--	690	--	pF
Output Capacitance	C_{oss}		--	120	--	pF
Reverse Transfer Capacitance	C_{rss}		--	90	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V, I_D=2A V_{GS}=10V,R_{GEN}=2.5Ω R_L=15Ω	--	11	--	nS
Turn-on Rise Time	t_r		--	7.4	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	35	--	nS
Turn-off Fall Time	t_f		--	9.1	--	nS
Total Gate Charge	Q_g	V_{DS}=30V,I_D=3A, V_{GS}=10V	--	15.5	--	nC
Gate-Source Charge	Q_{gs}		--	3.2	--	nC
Gate-Drain Charge	Q_{gd}		--	4.7	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage Note3	V_{SD}	V_{GS}=0V,I_S=6A	--	--	1.2	V
Diode Forward Current Note2	I_S		--	--	6	A

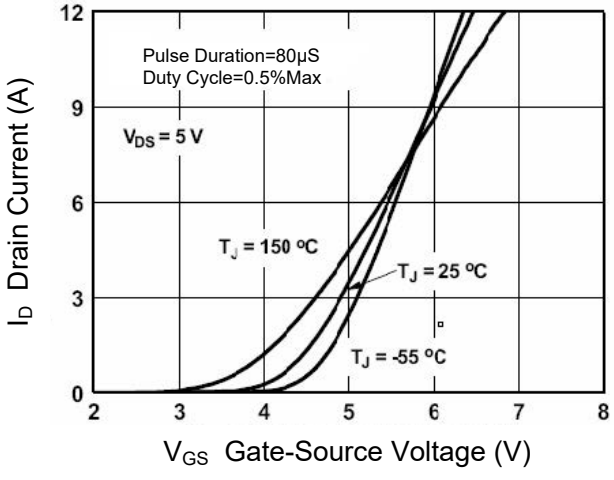
Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse width≤300μs, duty cycle≤2%.

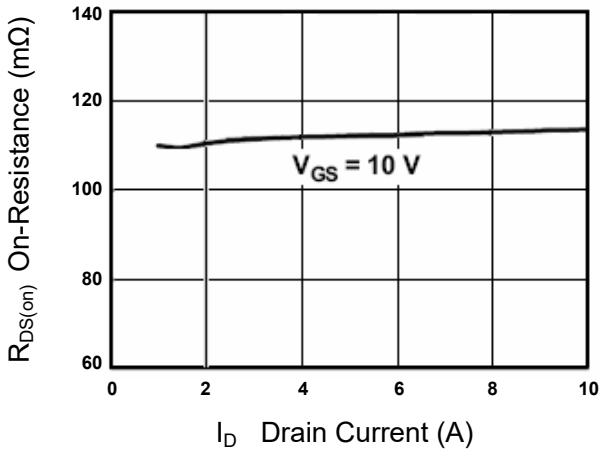
Typical Characteristic Curves

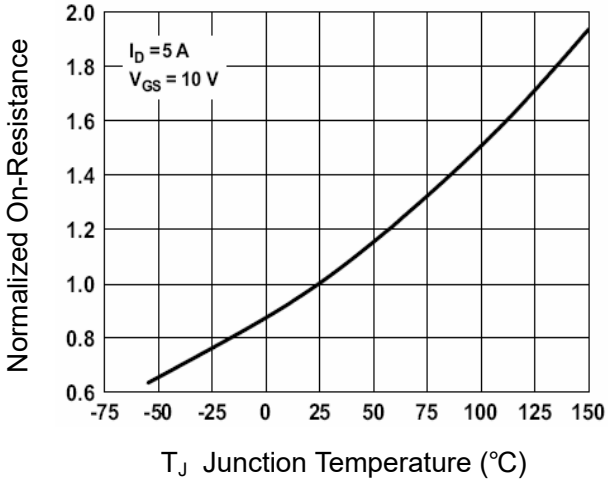


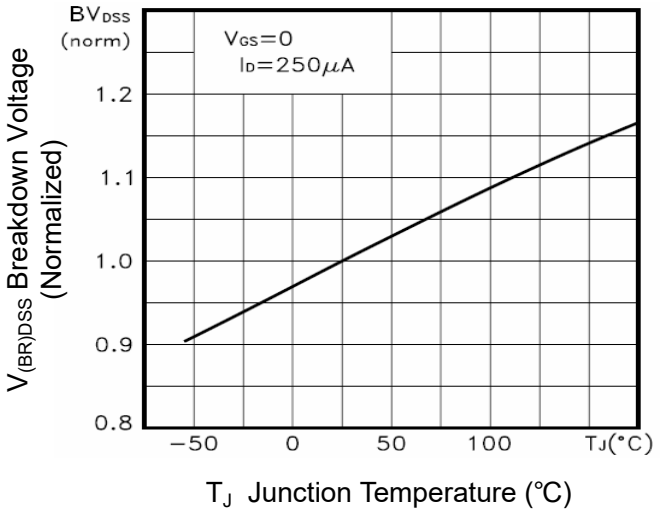


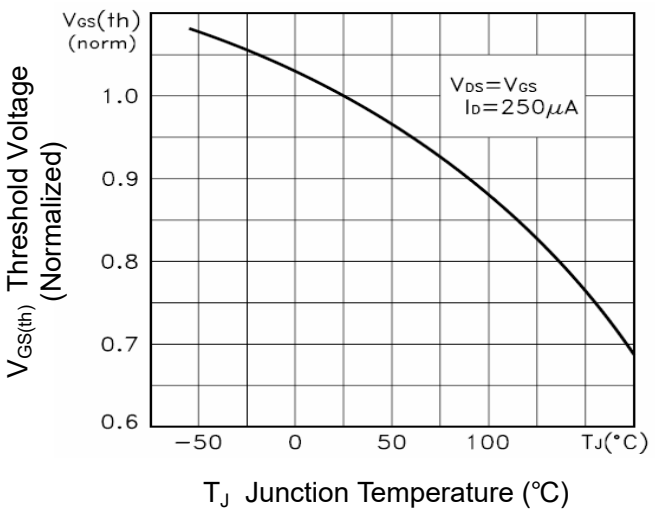


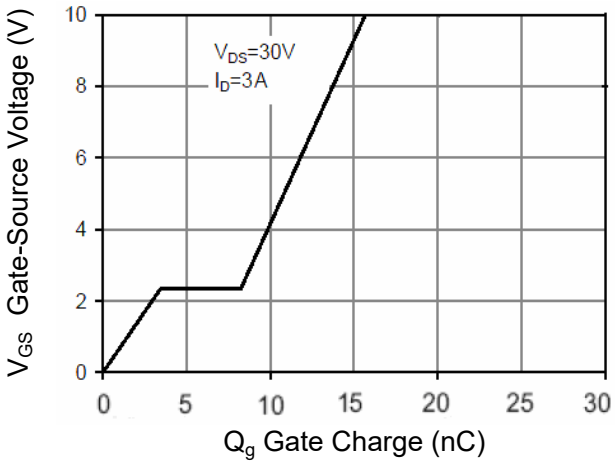


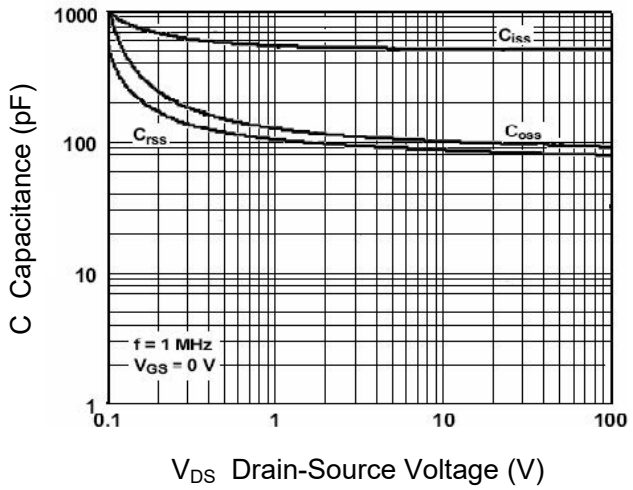


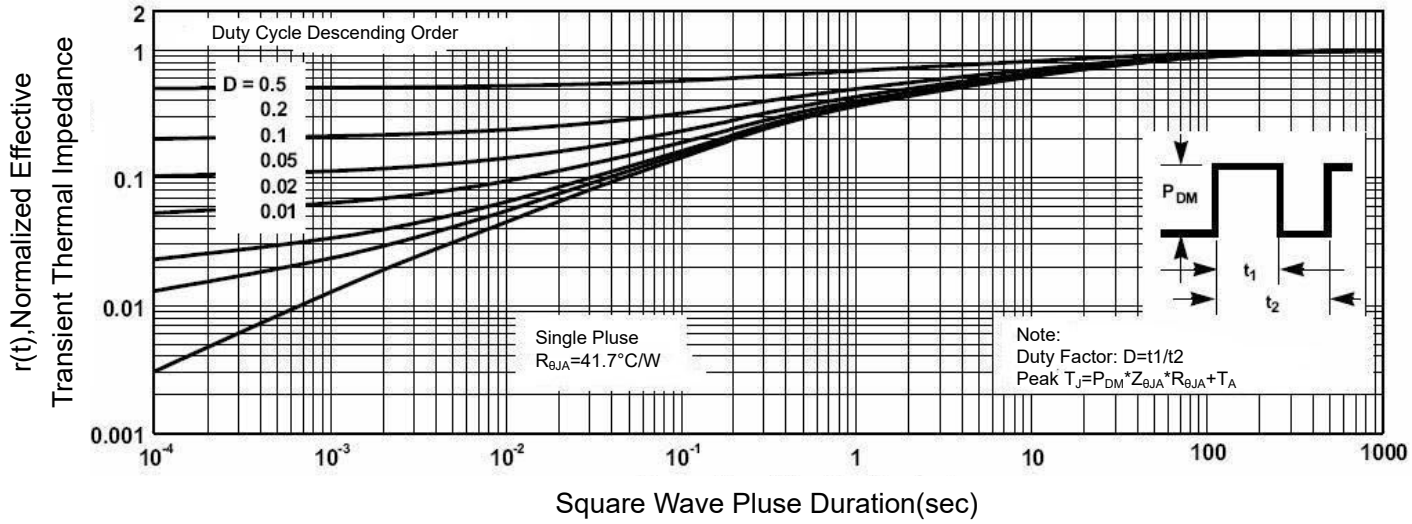



BVDSS (norm)
VGS=0
ID=250μA
1.2
1.1
1.0
0.9
0.8
−50
0
50
100
TJ(°C)
V(BR)DSS Breakdown Voltage (Normalized)
TJ Junction Temperature (°C)


VGS(th) (norm)
VDS=VGS
ID=250μA
1.0
0.9
0.8
0.7
0.6
−50
0
50
100
TJ(°C)
VGS(th) Threshold Voltage (Normalized)
TJ Junction Temperature (°C)


VDS=30V
ID=3A
10
8
6
4
2
0
0
5
10
15
20
25
30
VGS Gate-Source Voltage (V)
Qg Gate Charge (nC)

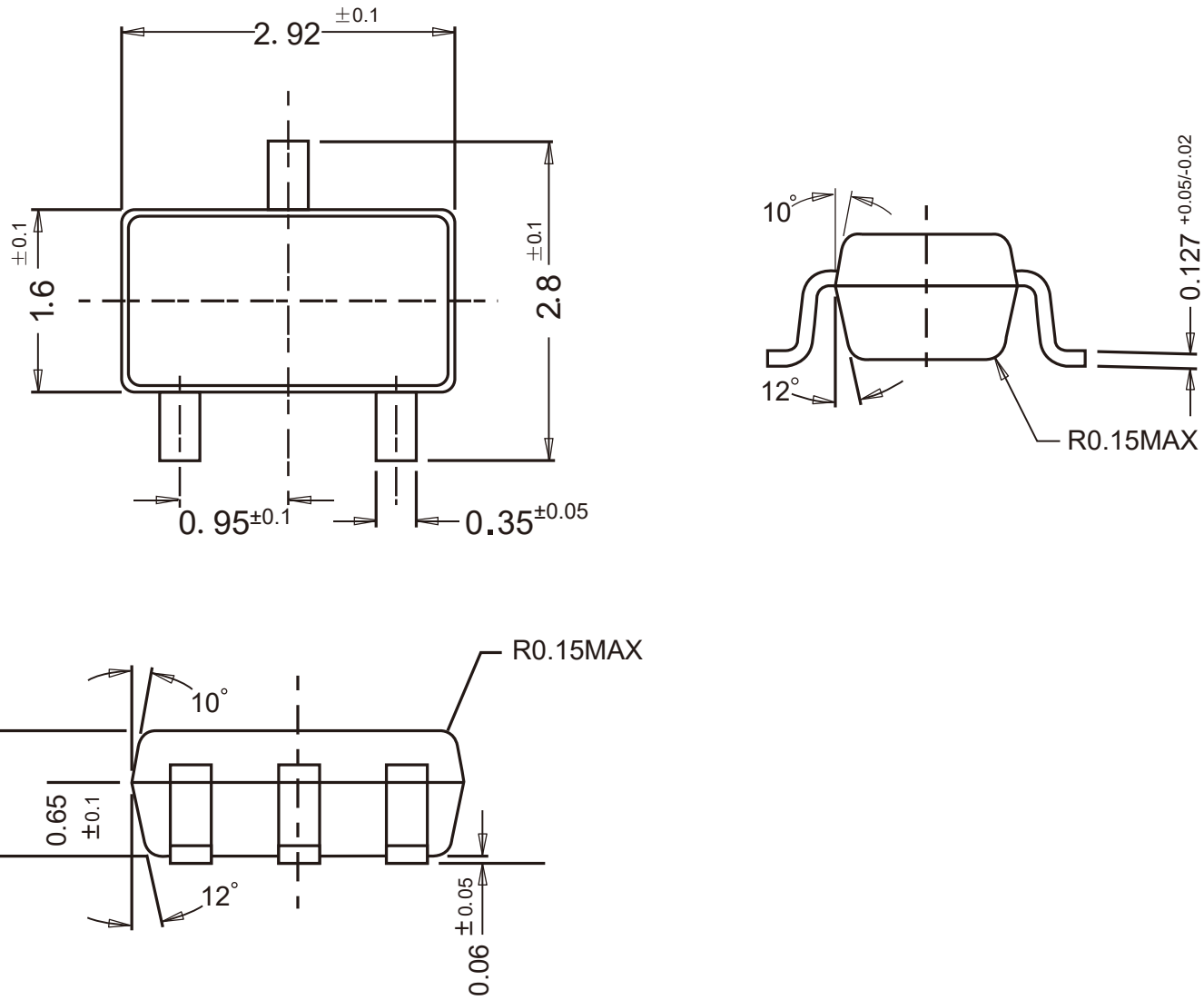

1000
100
10
1
0.1
1
10
100
Ciss
Coss
Crss
f = 1 MHz
VGS = 0 V
C Capacitance (pF)
VDS Drain-Source Voltage (V)


Duty Cycle Descending Order
D = 0.5
0.2
0.1
0.05
0.02
0.01
Single Pluse
RθJA=41.7°C/W
PDM
t1
t2
Note:
Duty Factor: D=t1/t2
Peak TJ=PDM*ZθJA*RθJA+TA
2
1
0.1
0.01
0.001
10-4
10-3
10-2
10-1
1
10
100
1000
r(t),Normalized Effective Transient Thermal Impedance
Square Wave Pluse Duration(sec)

Package Outline

SOT-23-3

Dimensions in mm



Ordering Information

Device	Package	Shipping
EP10H06NC	SOT-23-3	3,000PCS/Reel&7inches