

## 20V/4.7A N-Channel MOSFET

### Features

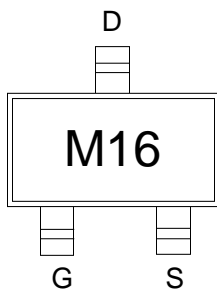
- Trench Power LV MOSFET technology
- High Power and current handling capability

### Product Summary

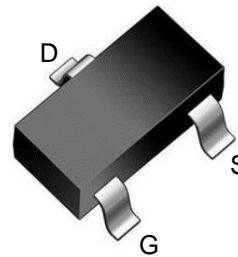
$V_{DS}$	$R_{DS(ON)}$ MAX	$I_D$ MAX
20V	47m $\Omega$ @4.5V	4.7A
	65m $\Omega$ @2.5V	

### Application

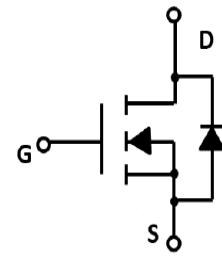
- PWM application
- Load switch



M16: Device code



SOT-23 top view



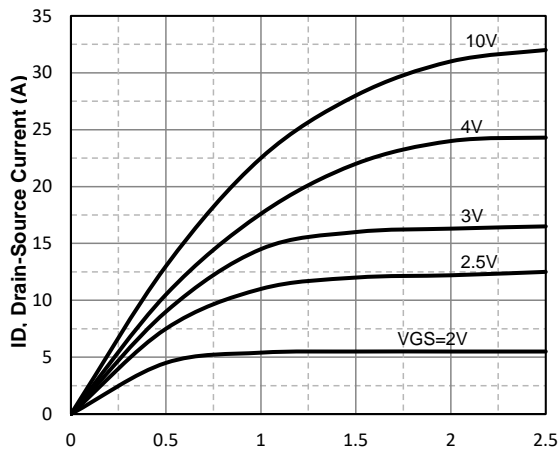
Schematic diagram

Marking and pin assignment

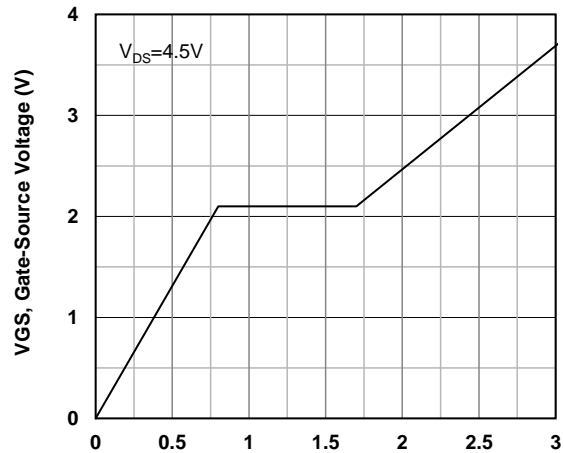
Absolute Maximum Ratings (TA=25°C unless otherwise noted)				
Symbol	Parameter		Rating	Unit
<b>Common Ratings (TC=25°C Unless Otherwise Noted)</b>				
$V_{DS}$	Drain-Source Breakdown Voltage		20	V
$V_{GS}$	Gate-Source Voltage		$\pm 10$	V
$T_J$	Maximum Junction Temperature		150	°C
$T_{STG}$	Storage Temperature Range		-50 to 155	°C
$I_S$	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$	4.7	A
<b>Mounted on Large Heat Sink</b>				
$I_{DM}$	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	10	A
$I_D$	Continuous Drain Current @GS=10V	$T_C=25^\circ\text{C}$	4.7	A
$P_D$	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	0.7	W
$R_{\theta JA}$	Thermal Resistance Junction-to-Ambient @ Steady State		178	°C/W

<b>Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise noted)</b>						
<b>Symbol</b>	<b>Parameter</b>	<b>Condition</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>	<b>Unit</b>
<b>Static Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
BV <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	VGS=0V, ID=250μA	20	--	--	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	VDS=20V, VGS=0V	--	--	1	μA
I <sub>GSS</sub>	Gate-Body Leakage Current	VGS=±10V, VDS=0V	--	--	±100	nA
V <sub>GS(th)</sub>	Gate Threshold Voltage	VDS=VGS, ID=250μA	0.45	0.7	0.9	V
R <sub>DS(on)</sub>	Drain-Source On-State Resistance	VGS=4.5V, ID=3.6A	--	37	47	mΩ
		VGS=2.5V, ID=3.1A	--	53	65	
<b>Dynamic Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise stated)</b>						
C <sub>ISS</sub>	Input Capacitance	VDS=10V, VGS=0V, f=1MHz	--	220	--	pF
C <sub>OSS</sub>	Output Capacitance		--	35	--	pF
C <sub>RSS</sub>	Reverse Transfer Capacitance		--	25	--	pF
<b>Switching Characteristics</b>						
Q <sub>g</sub>	Total Gate Charge	VDS=10V, ID=3.2A, VGS=4.5V	--	3.6	--	nC
Q <sub>gs</sub>	Gate Source Charge		--	0.9	--	nC
Q <sub>gd</sub>	Gate Drain Charge		--	0.8	--	nC
t <sub>d(on)</sub>	Turn-on Delay Time	VDD=10V, ID=1.5A, VGS=4.5V, RG=3Ω	--	7	--	nS
t <sub>r</sub>	Turn-on Rise Time		--	57	--	nS
t <sub>d(off)</sub>	Turn-Off Delay Time		--	15	--	nS
t <sub>f</sub>	Turn-Off Fall Time		--	53	--	nS
<b>Source- Drain Diode Characteristics</b>						
V <sub>SD</sub>	Forward on voltage	T <sub>J</sub> =25°C, I <sub>s</sub> =3.2A,	--	--	1.2	V

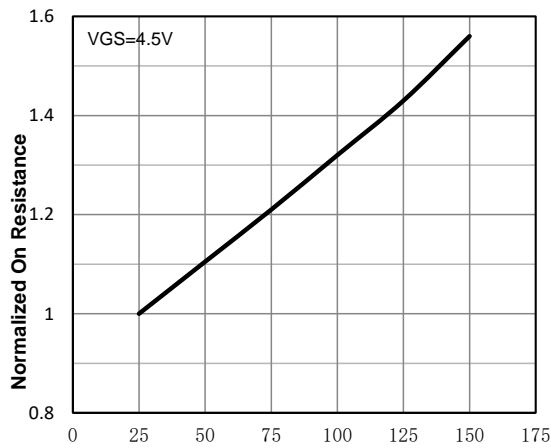
## Typical Operating Characteristics



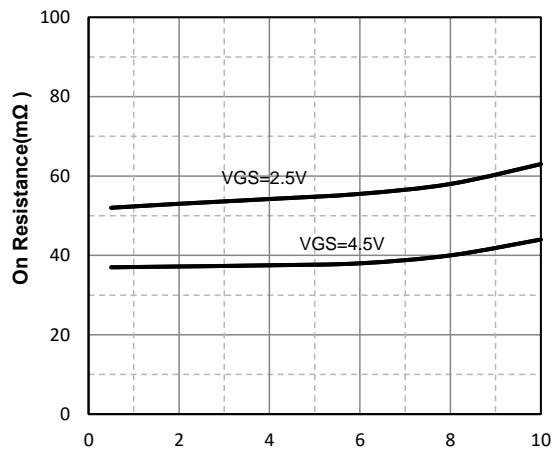
**VDS, Drain-Source Voltage (V)**  
**Fig1. Typical Output Characteristics**



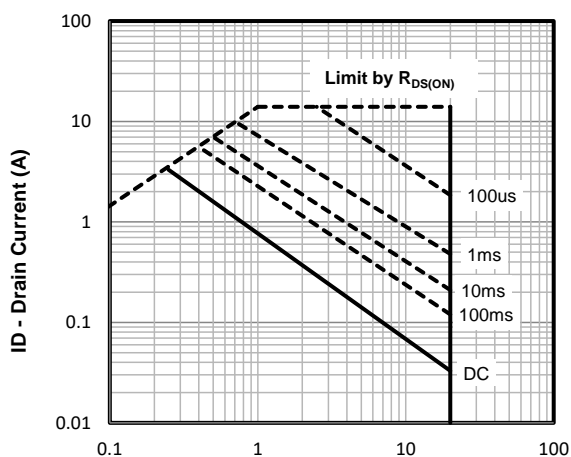
**Qg -Total Gate Charge (nC)**  
**Fig2. Typical Gate Charge Vs. Gate-Source Voltage**



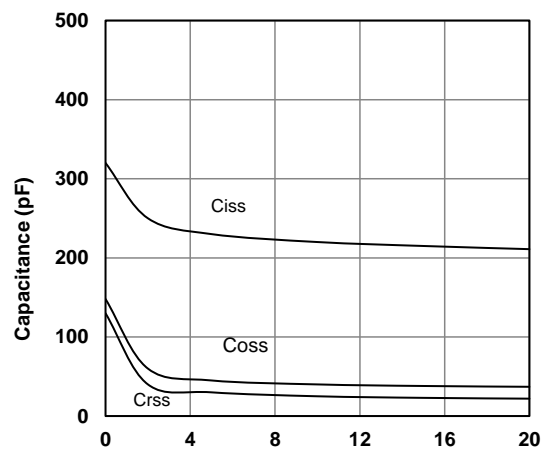
**Tj - Junction Temperature (°C)**  
**Fig3. Normalized On-Resistance Vs. Temperature**



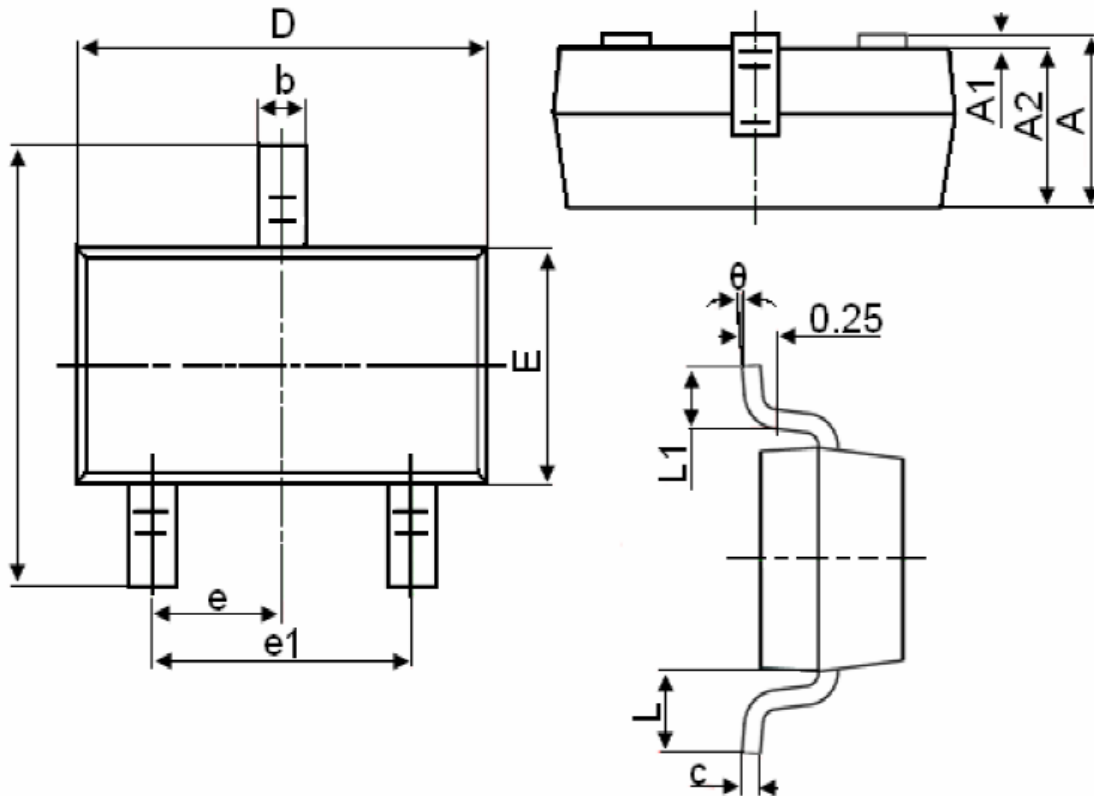
**ID, Drain-Source Current (A)**  
**Fig4. On-Resistance Vs. Drain-Source Current**



**VDS, Drain-Source Voltage (V)**  
**Fig5. Maximum Safe Operating Area**



**VDS, Drain-Source Voltage (V)**  
**Fig6 Typical Capacitance Vs. Drain-Source Voltage**

**SOT-23 Package information**


Symbol	Dimensions in Millimeters(mm)		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950TYP		0.037TYP	
e1	1.800	2.000	0.071	0.079
L	0.550REF		0.022REF	
L1	0.300	0.500	0.012	0.020
$\theta$	0°	8°	0°	8°