

SOT-23 Plastic-Encapsulate MOSFETS

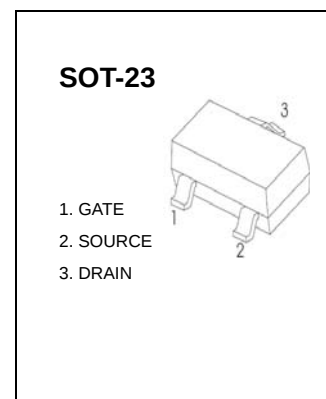
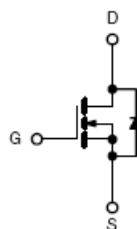
N-Channel Enhancement Mode Field Effect Transistor

General FEATURE

- TrenchFET Power MOSFET
- Lead free product is acquired
- Surface mount package

APPLICATION

- Load Switch for Portable Devices
- DC/DC Converter



MARKING: 40N05

Maximum ratings ($T_a=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	5	A
Drain Current-Pulsed (note 1)	I_{DM}	19	A
Power Dissipation	P_D	350	mW
Thermal Resistance from Junction to Ambient (note 2)	$R_{\theta JA}$	357	$^{\circ}\text{C}/\text{W}$
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55~+150	$^{\circ}\text{C}$

Electrical characteristics (T_a=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-source breakdown voltage	V _{(BR) DSS}	V _{GS} = 0V, I _D =250μA	40			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =40V,V _{GS} = 0V			1	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} = 0V			±100	nA
On characteristics						
Drain-source on-resistance (note 3)	R _{DS(on)}	V _{GS} =10V, I _D =5A			40	mΩ
		V _{GS} =4.5V, I _D =4A			60	mΩ
Forward tranconductance	g _{FS}	V _{DS} =5V, I _D =4A	8			S
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0		2.2	V
Dynamic Characteristics (note 4,5)						
Input capacitance	C _{iss}	V _{DS} =20V,V _{GS} =0V,f =1MHz		495		pF
Output capacitance	C _{oss}			42		pF
Reverse transfer capacitance	C _{rss}			33		pF
Gate resistance	R _g	V _{DS} =0V,V _{GS} =0V,f =1MHz			3.6	Ω
Switching Characteristics (note 4,5)						
Turn-on delay time	t _{d(on)}	V _{GS} =10V,V _{DS} =20V, I _D =5A,R _{GEN} =3Ω		15		ns
Turn-on rise time	t _r			49		ns
Turn-off delay time	t _{d(off)}			19		ns
Turn-off fall time	t _f			11		ns
Drain-source diode characteristics and maximum ratings						
Diode forward voltage (note 3)	V _{SD}	I _S =1A,V _{GS} =0V			1.2	V

Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Characteristics

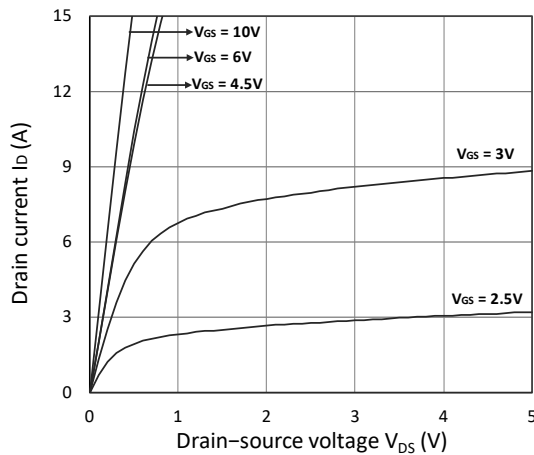


Figure 1. Output Characteristics

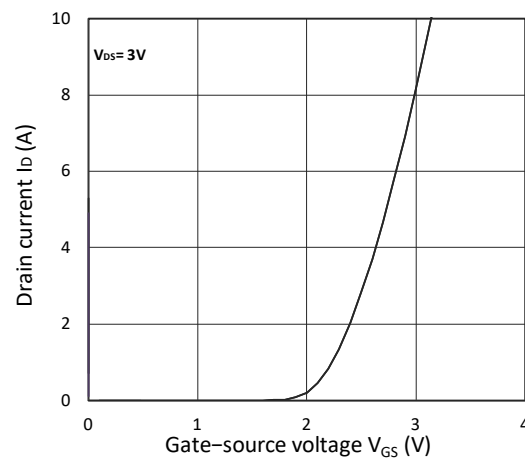


Figure 2. Transfer Characteristics

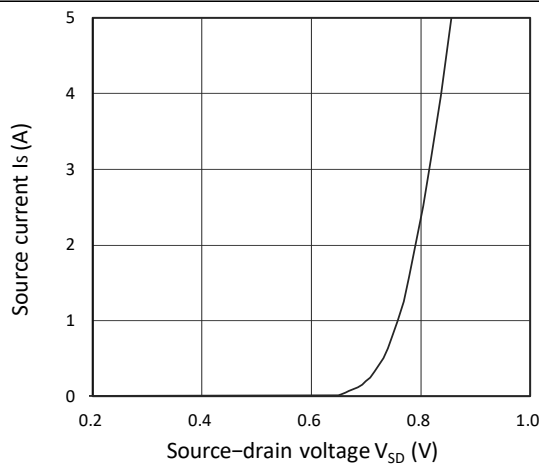


Figure 3. Forward Characteristics of Reverse

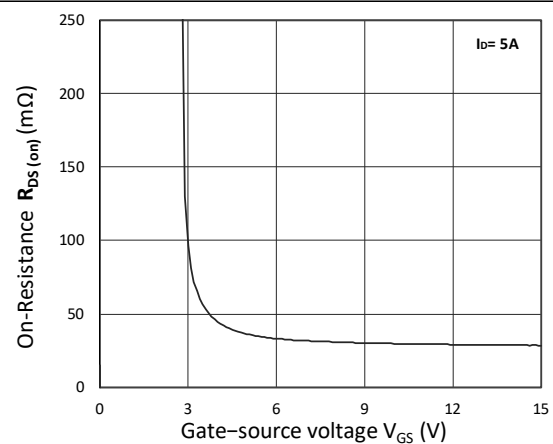


Figure 4. $R_{DS(on)}$ vs. V_{GS}

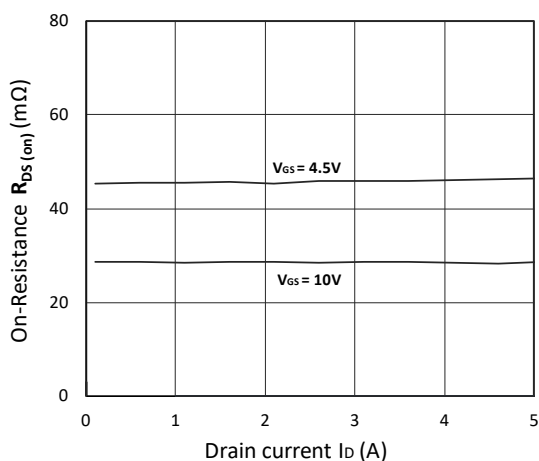


Figure 5. $R_{DS(on)}$ vs. I_D

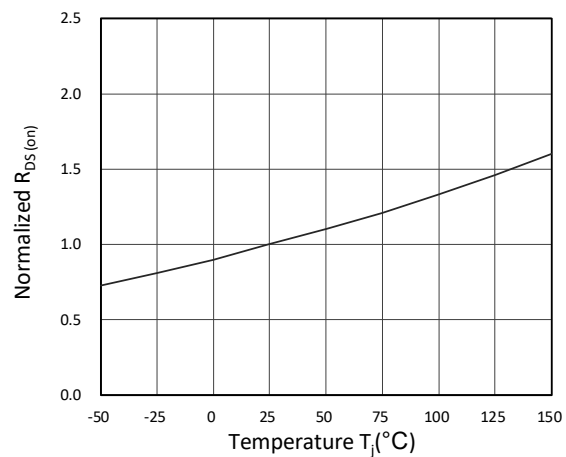


Figure 6. Normalized $R_{DS(on)}$ vs. Temperature