



100V N-Channel MOSFETs

General Description

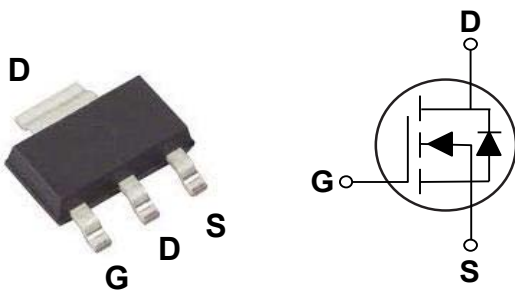
The TKMNM047 is the high cell density trench N-ch MOSFETs, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

BV_{DSS}	$R_{DS(ON)}$	I_D
100 V	47 m Ω	6 A

Features

- $R_{DS(ON)} \leq 47m\Omega @ V_{GS}=10V$
- Super Low Gate Charge
- Excellent CdV/dt effect decline
- Green Device Available

SOT-223 Pin Configuration



Applications

- Networking
- Load Switch
- LED applications

Absolute Maximum Ratings $T_C=25^\circ C$ unless otherwise noted

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current - Continuous ($T_A=25^\circ C$)	6	A
	Drain Current - Continuous ($T_A=70^\circ C$)	4.7	A
I_{DM}	Pulsed Drain Current (NOTE 1)	24	A
EAS	Single Pulse Avalanche Energy (NOTE 2)	11.3	mJ
IAS	Avalanche Current	15	A
P_D	Power Dissipation ($T_A=25^\circ C$) (NOTE 3)	1.5	W
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
Marking Code		NM047 , L0016	

Thermal Characteristics

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction to Ambient (Steady State)	---	70	$^\circ C/W$

Electrical Characteristics ($T_J=25^\circ\text{C}$, unless otherwise noted)

Off Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	100	---	---	V
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=80V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	10	μA
		$V_{DS}=80V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	100	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA

On Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
$R_{DS(ON)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=5A$	---	---	47	m Ω
		$V_{GS}=4.5V, I_D=5A$	---	---	50	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\mu A$	1.2	---	2.5	V
gfs	Forward Transconductance	$V_{DS}=5V, I_D=5A$	---	6.2	---	S

Dynamic and switching Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Q_g	Total Gate Charge	$V_{DS}=80V, V_{GS}=10V, I_D=5A$	---	60	---	nC
Q_{gs}	Gate-Source Charge		---	9.2	---	
Q_{gd}	Gate-Drain Charge		---	9.9	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=50V, V_{GS}=10V, R_G=3.3\Omega, I_D=3A$	---	10.8	---	nS
T_r	Rise Time		---	27	---	
$T_{d(off)}$	Turn-Off Delay Time		---	56	---	
T_f	Fall Time		---	24	---	
C_{iss}	Input Capacitance	$V_{DS}=15V, V_{GS}=0V, F=1\text{MHz}$	---	3848	---	pF
C_{oss}	Output Capacitance		---	137	---	
C_{riss}	Reverse Transfer Capacitance		---	82	---	

Drain-Source Diode Characteristics and Ratings

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current (NOTE 4)	$V_G=V_D=0V, \text{Force Current}$	---	---	6	A
I_{SM}	Pulsed Source Current (NOTE 1 & 4)		---	---	24	A
V_{SD}	Diode Forward Voltage (NOTE 1)	$V_{GS}=0V, I_S=1A, T_J=25^\circ\text{C}$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=5A, di/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	25	---	nS
Q_{rr}	Reverse Recovery Charge		---	29	---	nC

NOTES :

1. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
2. The EAS data shows Max. rating. The test condition is $V_{DD}=25V, V_{GS}=10V, I_{AS}=15A, L=0.1\text{mH}$.
3. The power dissipation is limited by 150°C junction temperature.
4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.



Characteristics Curves

FIG.1-Typical Output Characteristics

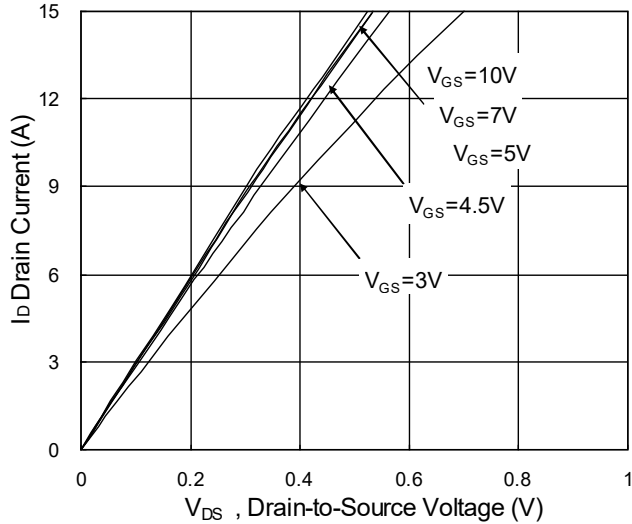


FIG.2-On-Resistance vs. G-S Voltage

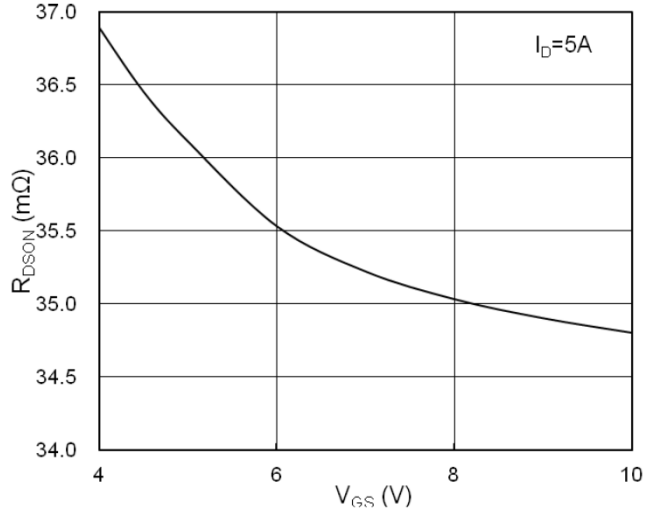


FIG.3-Forward Characteristics Of Reverse Diode

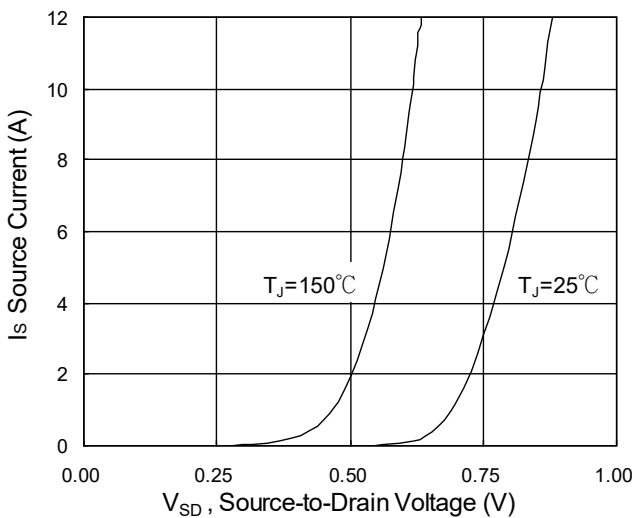


FIG.4-Gate Charge Characteristics

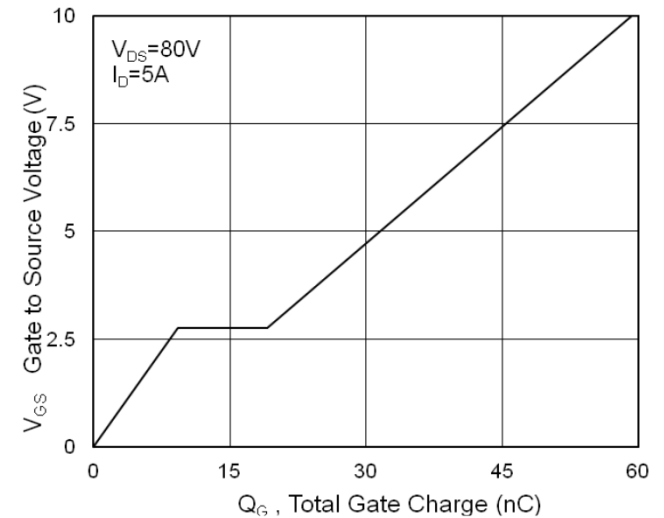


FIG.5-Normalized $V_{GS(th)}$ vs. T_J

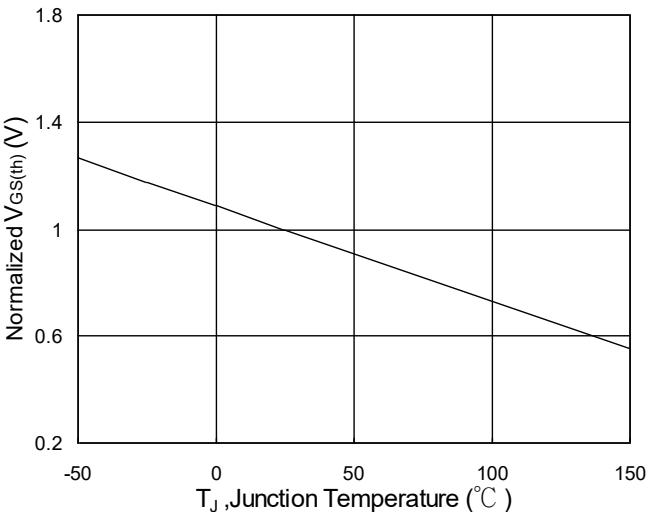
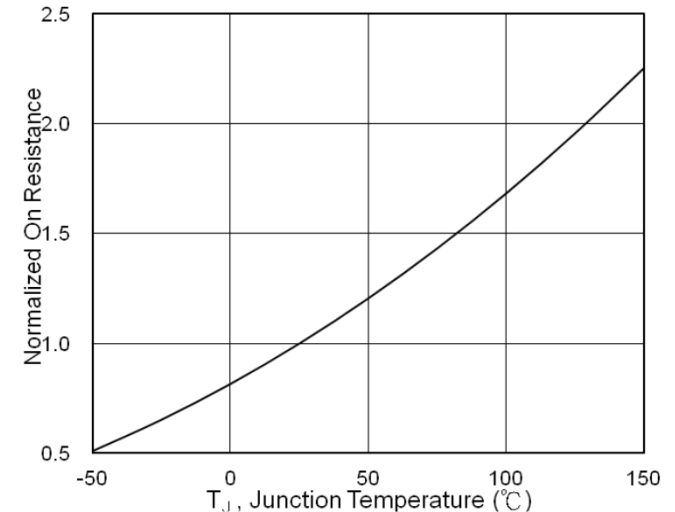


FIG.6-Normalized $R_{DS(on)}$ vs. T_J





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Characteristics Curves

FIG.7-Switching Time Waveform

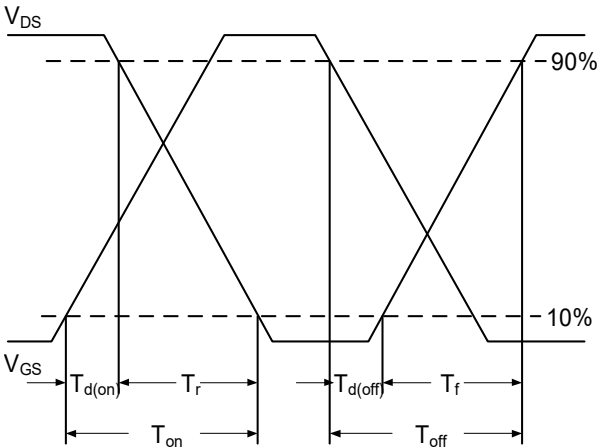
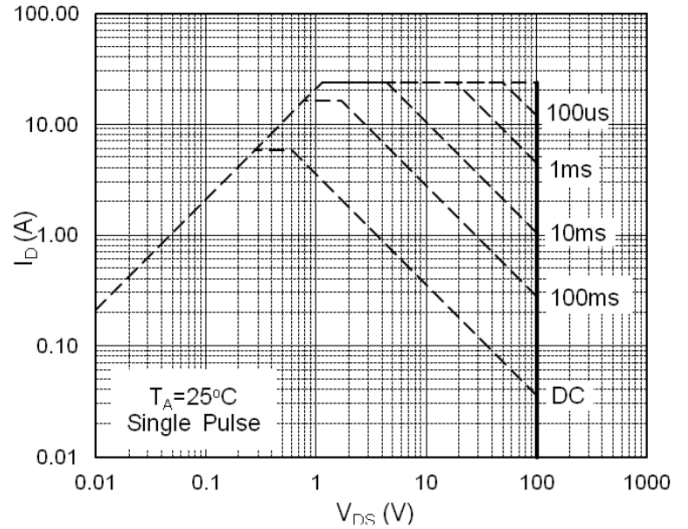
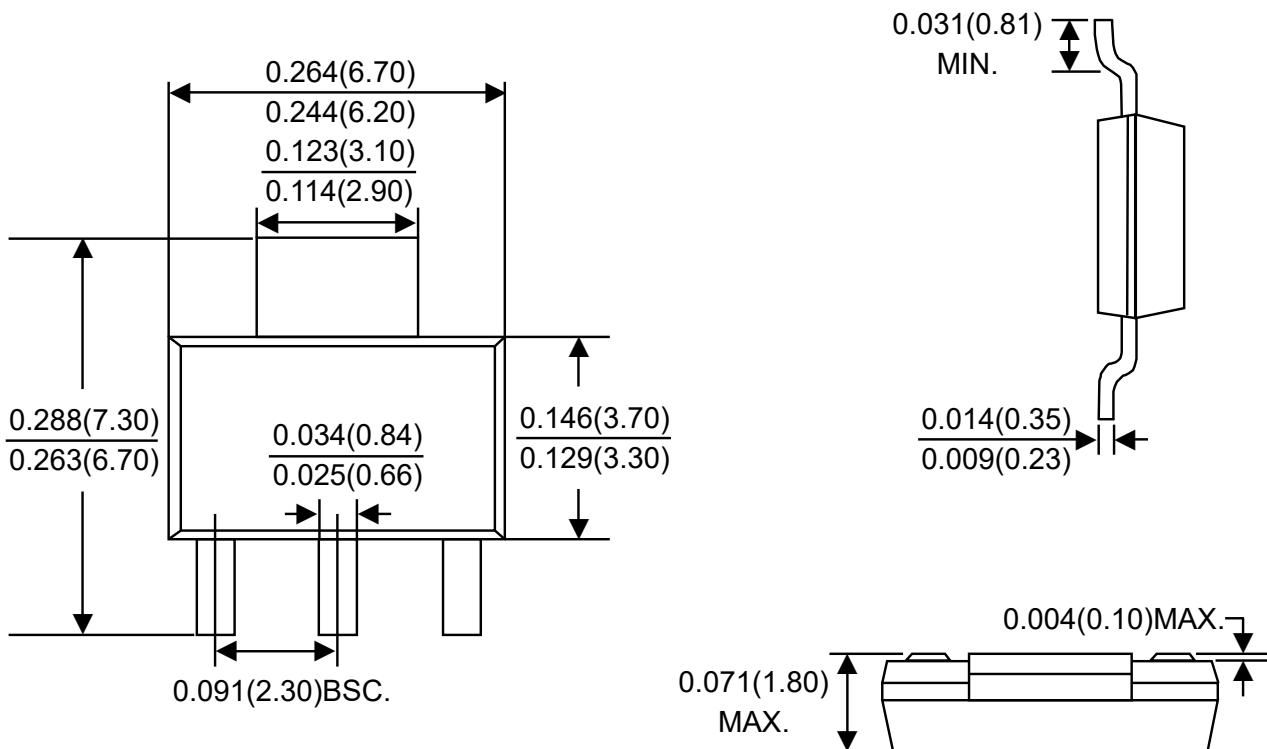


FIG.8-Safe Operating Area



Package Outline Dimensions



SOT-223

Dimensions in inches and (millimeters)



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