

N-Channel 240 V (D-S) MOSFET

PRODUCT SUMMARY					
Part Number	V _{DS} (V)	R _{DS(on)} (Ω)	V _{GS(th)} (A)	I _D (A)	Q _g (Typ.)
TN2404K	240	4 at V _{GS} = 10 V	0.8 to 2	0.2	4.87 nC
TN2404K, BS107KL				0.3	

FEATURES

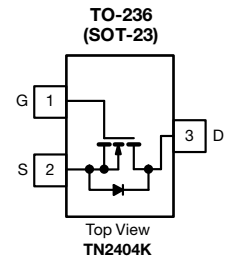
- Low On-Resistance: 4 Ω
- Secondary Breakdown Free: 260 V
- Low Power/Voltage Driven
- Low Input and Output Leakage
- Excellent Thermal Stability
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
Available

APPLICATIONS

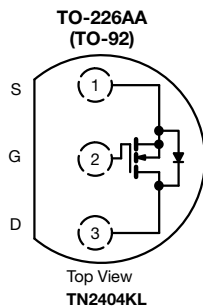
- High-Voltage Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Transistors, etc.
- Telephone Mute Switches, Ringer Circuits
- Power Supply, Converters
- Motor Control



BENEFITS

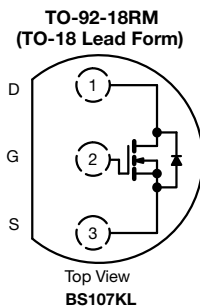
- Low Offset Voltage
- Full-Voltage Operation
- Easily Driven Without Buffer
- Low Error Voltage
- No High-Temperature "Run-Away"

Marking Code: K1ywl
K1 = Part Number Code for TN2404K
y = Year Code
w = Week Code
l = Lot Traceability



Device Marking
Front View

"S" TN
2404KL
xxyy
"S" = Siliconix Logo
xxyy = Date Code



Device Marking
Front View

"S" BS
107KL
xxyy
"S" = Siliconix Logo
xxyy = Date Code

ORDERING INFORMATION

Standard Partnumber	Ordering Part Number	Option
TN2404K	TN2404K-T1-E3	Lead (Pb) free
	TN2404K-T1-GE3	Lead (Pb) free and Halogen free
TN2404KL	TN2404KL-TR1-E3	With Tape and Reel Spool Option
BS107KL	BS107KL-TR1-E3	

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

Parameter	Symbol	TN2404K	TN2404KL/BS107KL	Symbol
Drain-Source Voltage	V _{DS}	240		V
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C)	I _D	T _A = 25 °C	0.2	A
		T _A = 70 °C	0.16	
Pulsed Drain Current (t = 300 μs)	I _{DM}	0.8	1.4	
Maximum Power Dissipation	P _D	T _A = 25 °C	0.36	W
		T _A = 70 °C	0.23	
Thermal Resistance Junction-to-Ambient	R _{thJA}	350 ^b	156	°C/W
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150		°C

Notes:

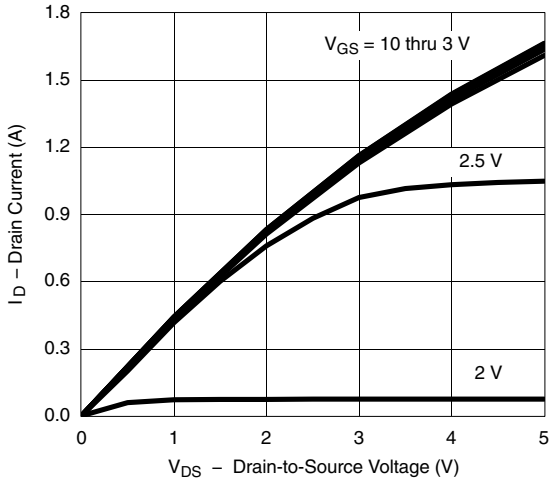
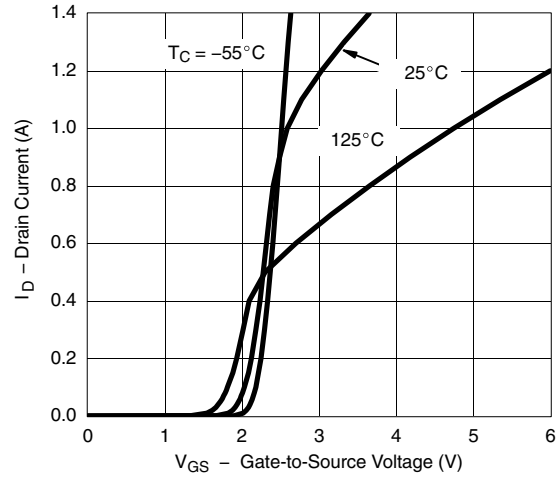
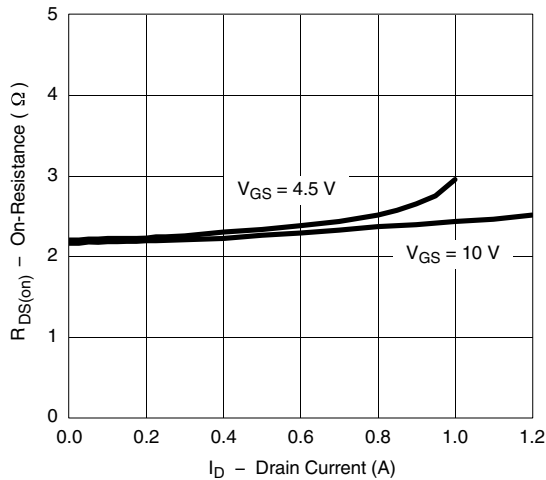
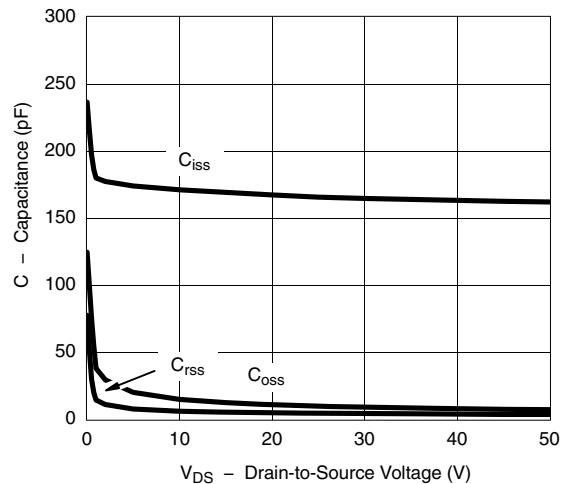
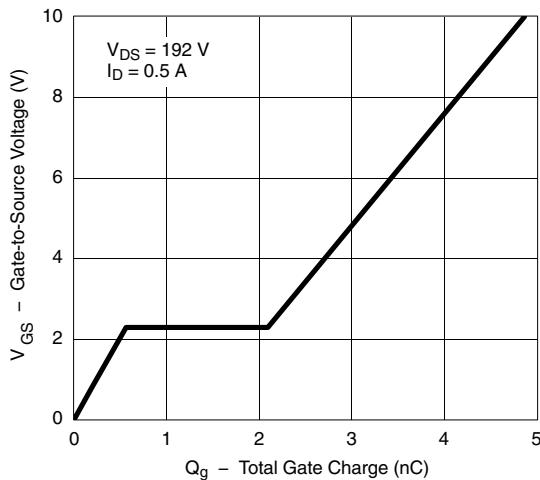
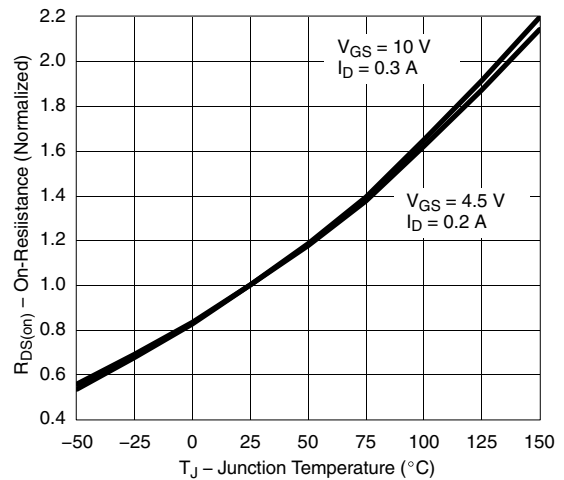
- Pulse width limited by maximum junction temperature.
- Surface mounted on an FR4 board.

SPECIFICATIONS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Limits			
			Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$	240	257		V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.8	1.65	2	
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 192\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 192\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 10\text{ V}, V_{GS} = 10\text{ V}$	0.8			A
		$V_{DS} = 10\text{ V}, V_{GS} = 4.5\text{ V}$	0.5			
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 0.3\text{ A}$		2.2	4	Ω
		$V_{GS} = 4.5\text{ V}, I_D = 0.2\text{ A}$		2.3	4	
		$V_{GS} = 2.5\text{ V}, I_D = 0.1\text{ A}$		2.4	6	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\text{ V}, I_D = 0.3\text{ A}$		1.6		S
Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 0.3\text{ A}$		0.8	1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 192\text{ V}, V_{GS} = 10\text{ V}, I_D = 0.5\text{ A}$		4.87	8	nC
Gate-Source Charge	Q_{gs}			0.56		
Gate-Drain Charge	Q_{gd}			1.53		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 60\text{ V}, R_L = 200\text{ }\Omega$ $I_D \cong 0.3\text{ A}, V_{GEN} = 10\text{ V}, R_g = 25\text{ }\Omega$		5	10	ns
Rise Time	t_r			12	20	
Turn-Off Delay Time	$t_{d(off)}$			35	60	
Fall Time	t_f			16	25	

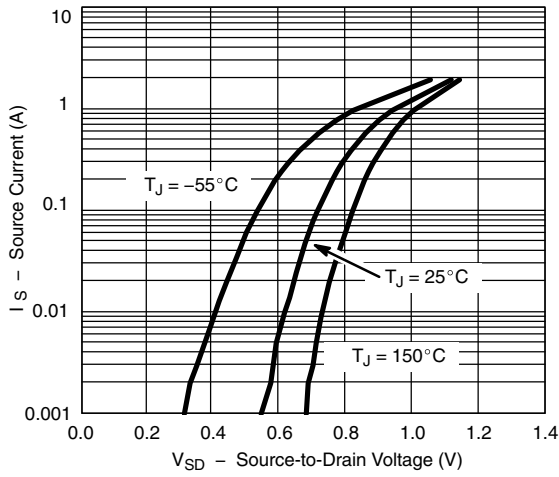
Notes:

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- b. Guaranteed by design, not subject to production testing.

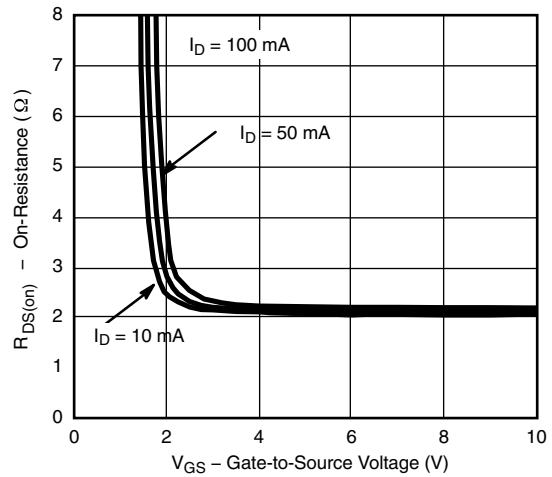
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

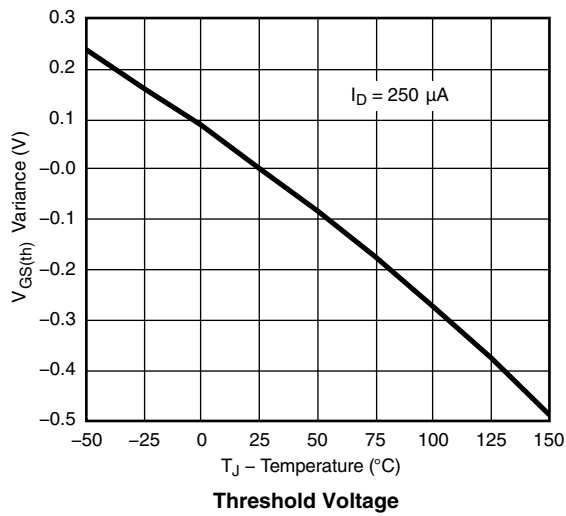
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Source-Drain Diode Forward Voltage

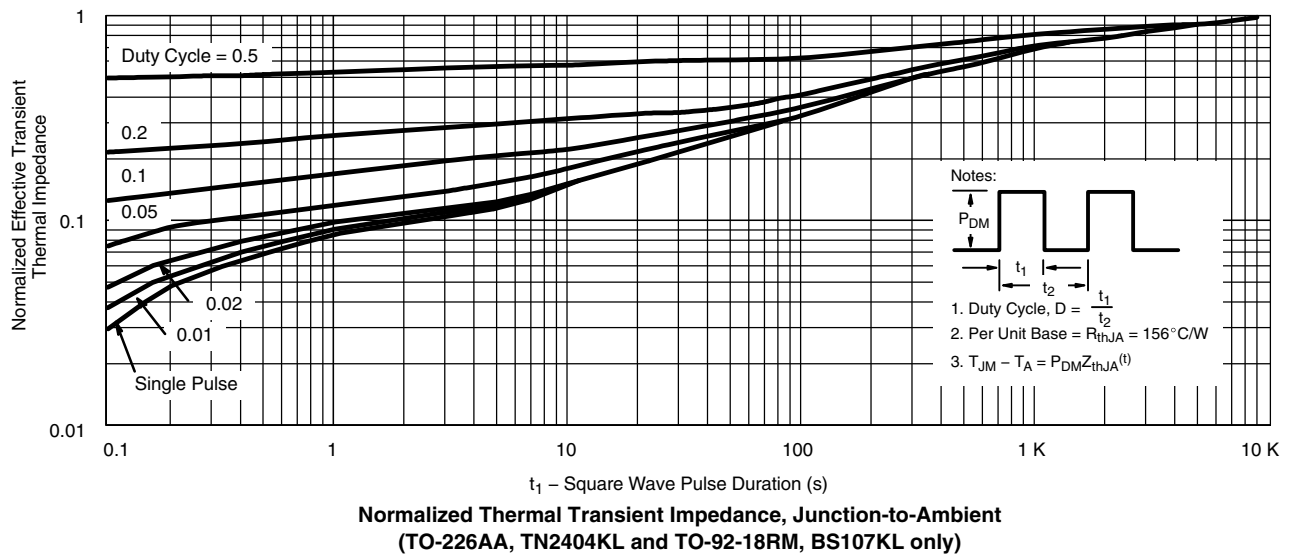
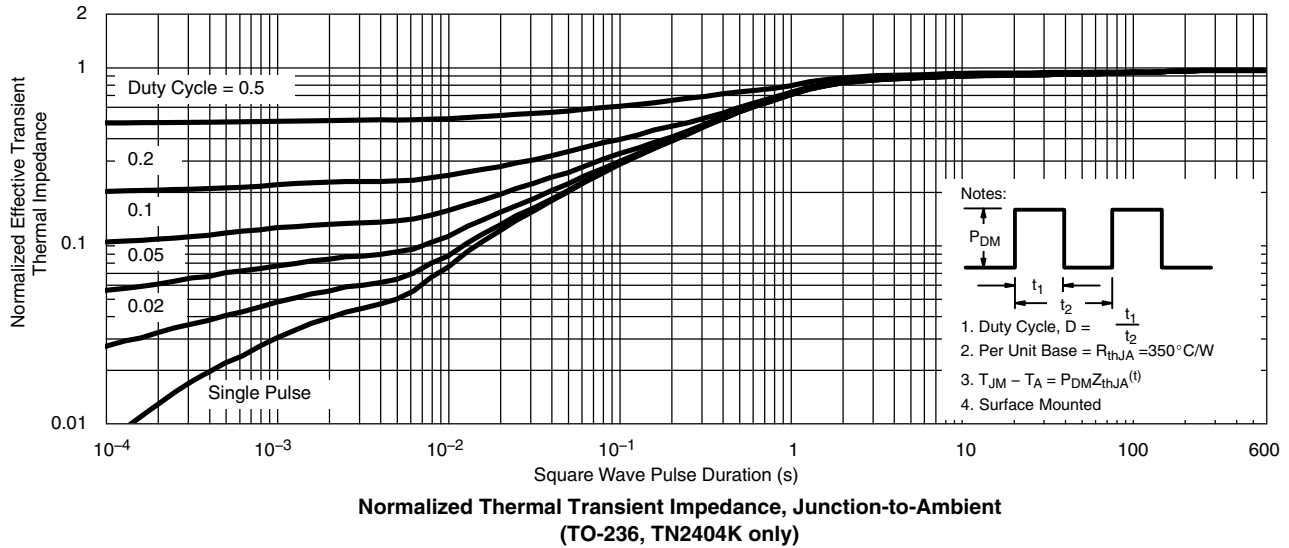


On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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SOT-23 (TO-236): 3-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A ₁	0.01	0.10	0.0004	0.004
A ₂	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E ₁	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e ₁	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L ₁	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°

ECN: S-03946-Rev. K, 09-Jul-01
DWG: 5479

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads
Dimensions in Inches/(mm)

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