N-Channel 240-V (D-S) MOSFET

PRODUCT SUMMARY

Part Number	V_{DS} Min (V)	$r_{DS(on)}$ (Ω)	$V_{GS(th)}$ (V)	I_D (A)
TN2404K	240	4 @ V_{GS} = 10 V	0.8 to 2.0	0.2
TN2404KL/BS107KL		4 @ V_{GS} = 10 V	0.8 to 2.0	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

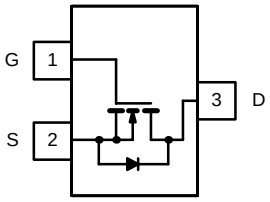
BENEFITS

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

APPLICATIONS

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

TO-236
(SOT-23)



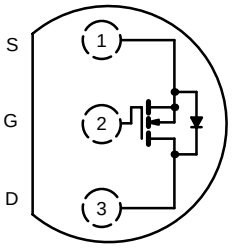
Top View

TN2404K

Marking Code: K1*ywl*

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

TO-226AA
(TO-92)



Device Marking
Front View

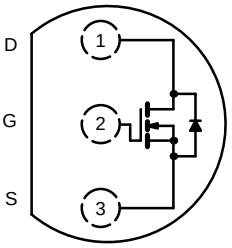
"S" TN
2404KL
xxyy

"S" = Siliconix Logo
xxyy = Date Code

Top View

TN2404KL

TO-92-18RM
(TO-18 Lead Form)



Device Marking
Front View

"S" BS
107KL
xxyy

"S" = Siliconix Logo
xxyy = Date Code

Top View

BS107KL

ORDERING INFORMATION

TN2404K-T1	With Tape and Reel Folding Option
TN2404KL-TA	
BS107KL-TA	
TN2404KL-TR1	Spool Option
BS107KL-TR1	

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter		Symbol	TN2404K	TN2404KL/BS107KL	Unit
Drain-Source Voltage		V_{DS}	240		V
Gate-Source Voltage		V_{GS}	±20		
Continuous Drain Current (T_J = 150°C)	T_A= 25°C	I_D	0.2	0.3	A
	T_A= 70°C		0.16	0.25	
Pulsed Drain Current[a]		I_{DM}	0.8	1.4	
Power Dissipation	T_A= 25°C	P_D	0.36	0.8	W
	T_A= 70°C		0.23	0.51	
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
a. Pulse width limited by maximum junction temperature.
b. Surface mounted on an FR4 board.

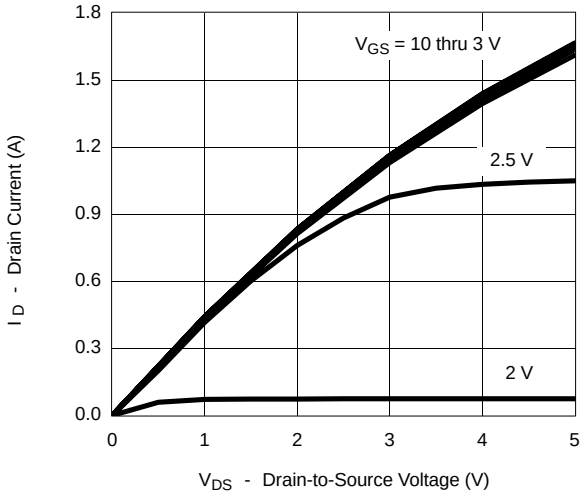
SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Conditions	Limits Min	Limits Typ[a]	Limits Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 100 μA	240	257		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	0.8	1.65	2.0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 192 V, V_{GS} = 0 V			1	μA
		T_J = 55°C			10	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 10 V, V_{GS} =10 V	0.8			A
		V_{DS} = 10 V, V_{GS} = 4.5 V	0.5			
Drain-Source On-Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 0.3 A		2.2	4	Ω
		V_{GS} = 4.5 V, I_D = 0.2 A		2.3	4	
		V_{GS} = 2.5 V, I_D = 0.1 A		2.4	6	
Forward Transconductance[b]	g_{fs}	V_{DS} = 10 V, I_D = 0.3 A		1.6		S
Diode Forward Voltage	V_{SD}	I_S = 0.3 A, V_{GS} = 0 V		0.8	1.2	V
Dynamic[a]						
Total Gate Charge	Q_g	V_{DS} = 192 V, V_{GS} = 10 V, I_D = 0.5 A		4.87	8	nC
Gate-Source Charge	Q_{gs}			0.56		
Gate-Drain Charge	Q_{gd}			1.53		
Turn-On Time	$t_{d(on)}$	V_{DD} = 60 V, R_L = 200 Ω I_D ≃ 0.3 A, V_{GEN} = 10 V, R_G = 25 Ω		5	10	nS
	t_r			12	20	
turn-Off Time	$t_{d(off)}$			35	60	
	t_r			16	25	

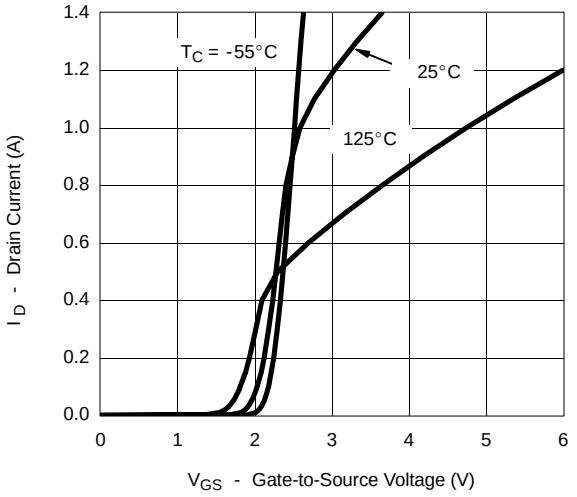
Notes
a. For DESIGN AID ONLY, not subject to production testing.
b. Pulse test: PW ≤ 300 μs duty cycle ≤ 2%.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

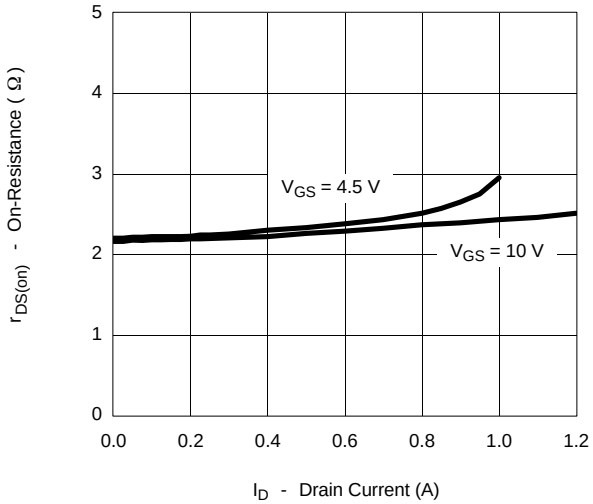
Output Characteristics



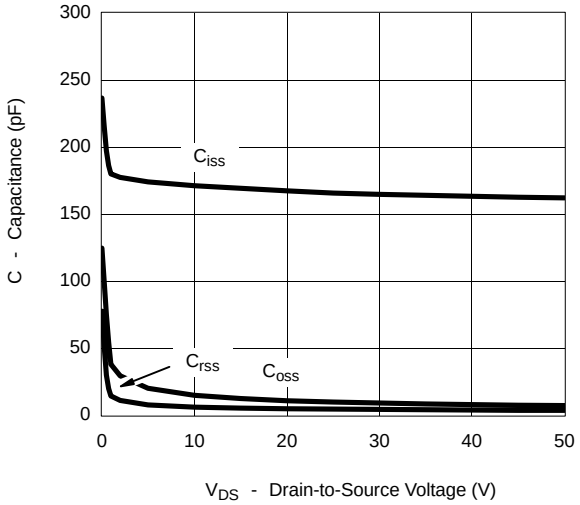
Transfer Characteristics



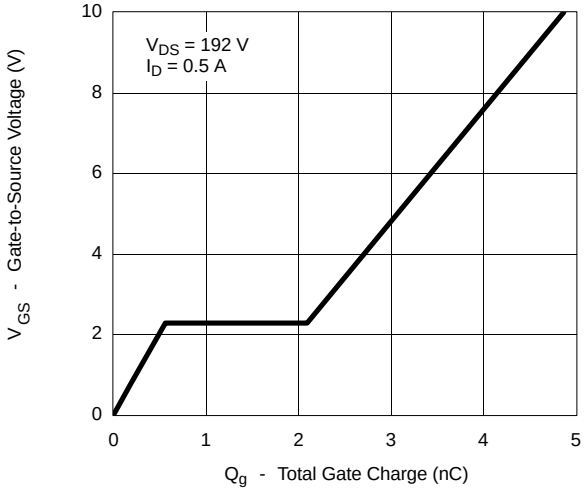
On-Resistance vs. Drain Current



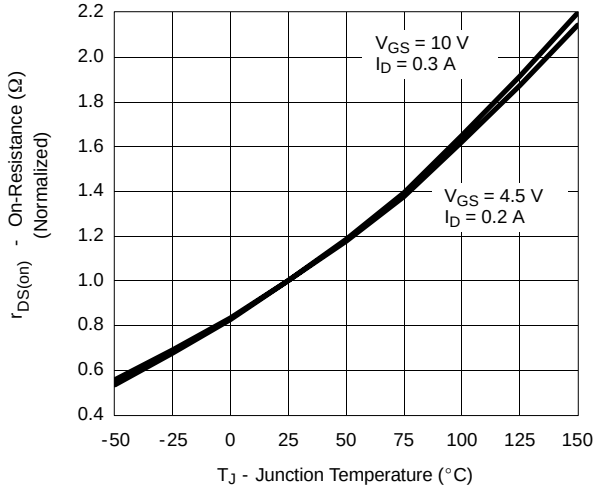
Capacitance



Gate Charge

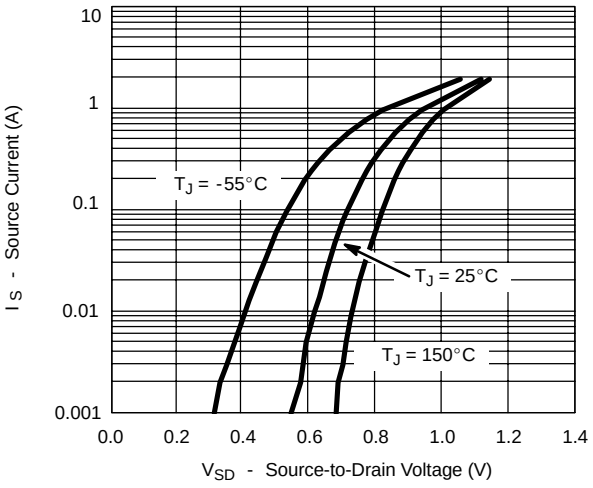


On-Resistance vs. Junction Temperature

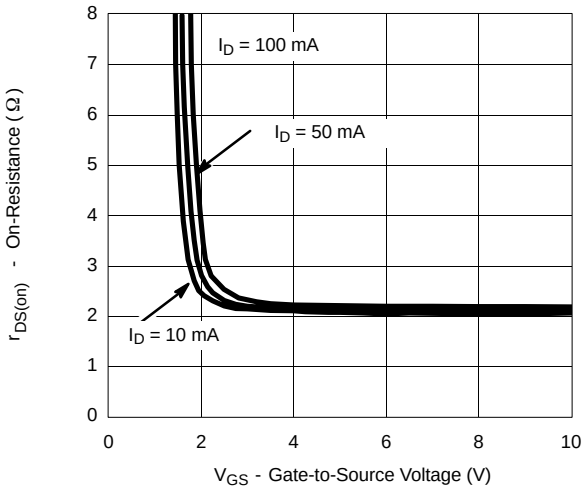


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

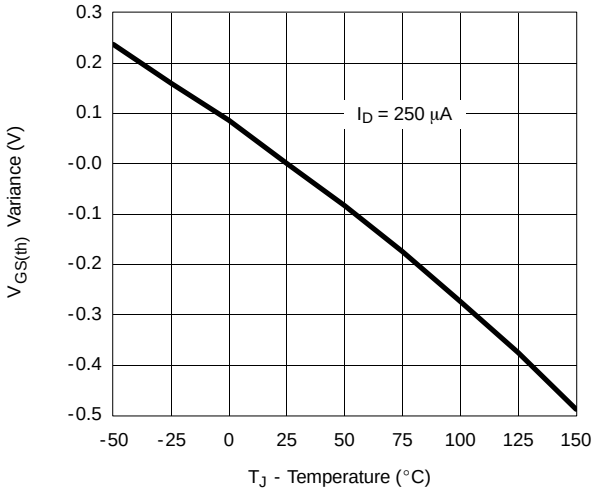
Source-Drain Diode Forward Voltage



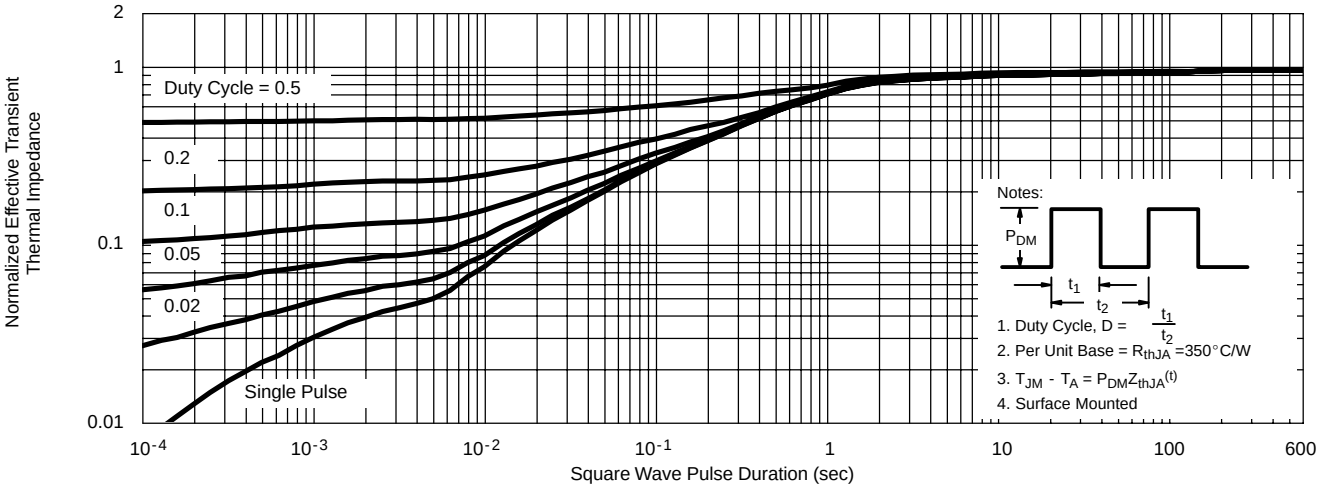
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-236, TN2404K Only)



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

Normalized Effective Transient Thermal Impedance, Junction-to-Ambient
(TO-226AA, TN2404KL and TO-92-18RM, BS107KL Only)