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)	Q_g (Typ)
TN2404K	240	4 @ V_{GS} = 10 V	0.8 to 2.0	0.2	4.87
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

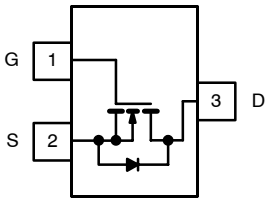
BENEFITS

- 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)



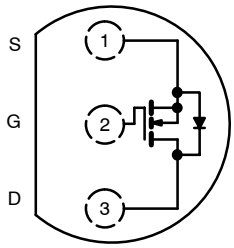
Top View

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

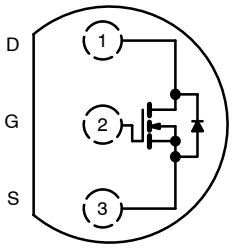
"S" TN
2404KL
xxyy

"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		
Standard Part Number	Lead (Pb)-Free Part Number	Option
TN2404K-T1	TN2404K-T1—E3	With Tape and Reel Folding Option
TN2404KL-TR1	TN2404KL-TR1—E3	Spool Option
BS107KL-TR1	BS107KL-TR1—E3	

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)

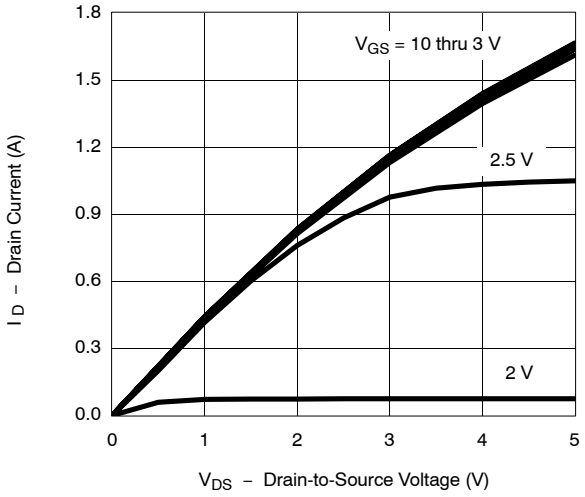
Parameter	Symbol	Test Conditions	Limits Min	Limits Typ[a]	Limits Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 100 μA	240	257		V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	0.8	1.65	2.0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 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%.

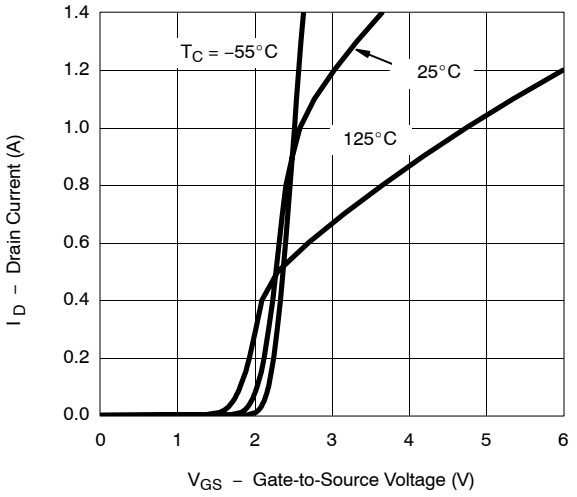
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

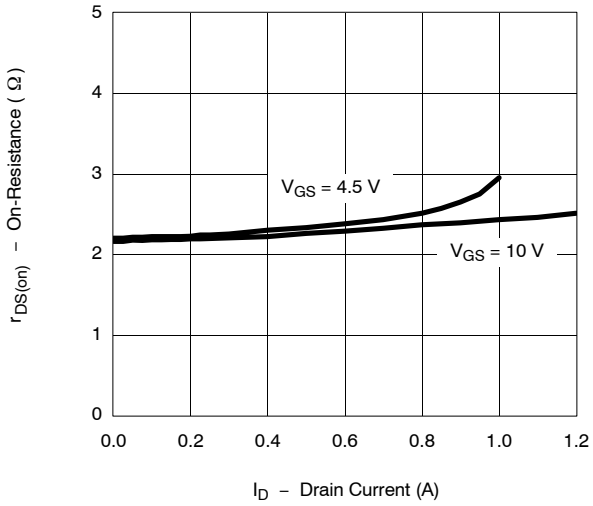
Output Characteristics



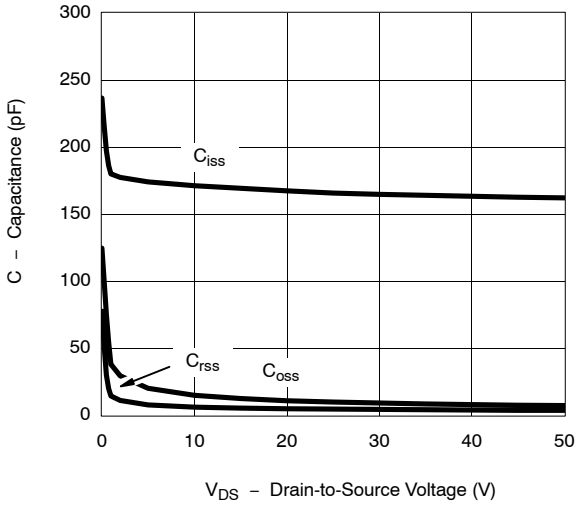
Transfer Characteristics



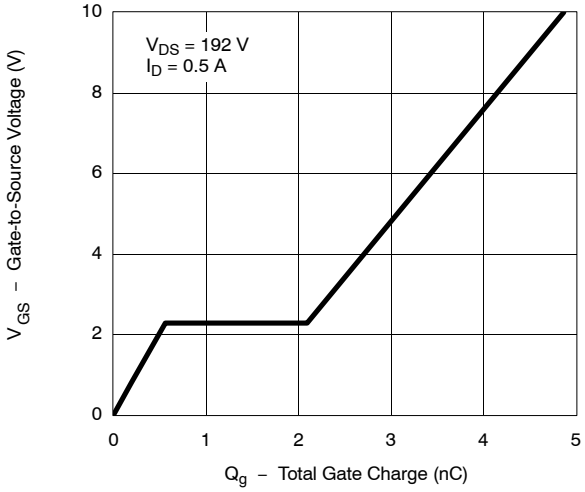
On-Resistance vs. Drain Current



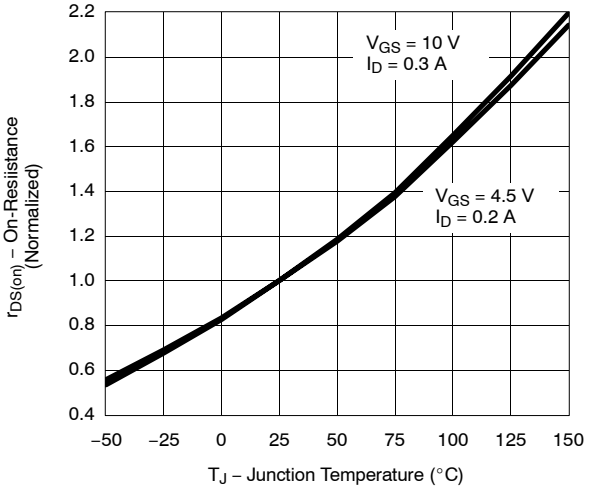
Capacitance



Gate Charge

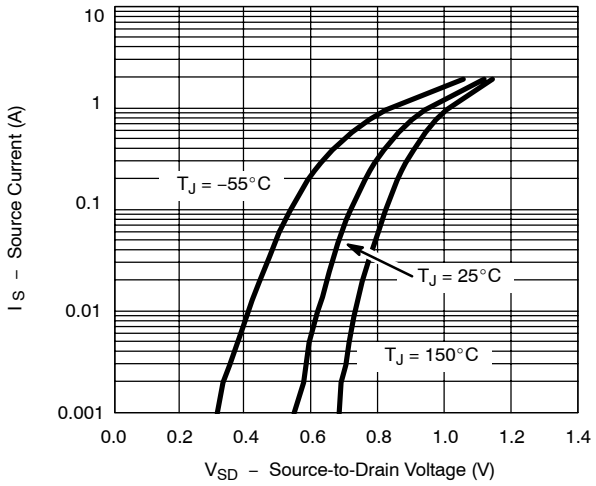


On-Resistance vs. Junction Temperature

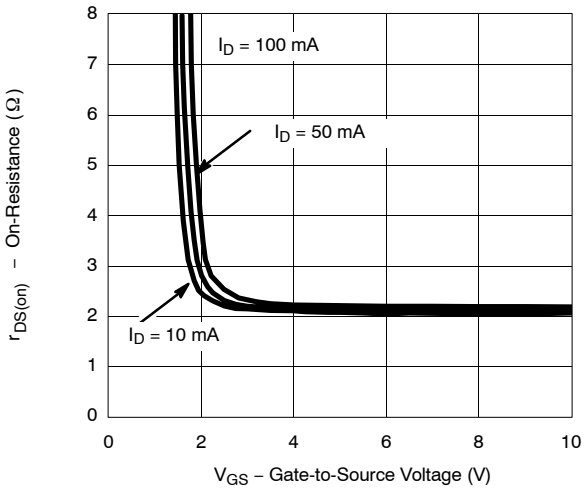


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

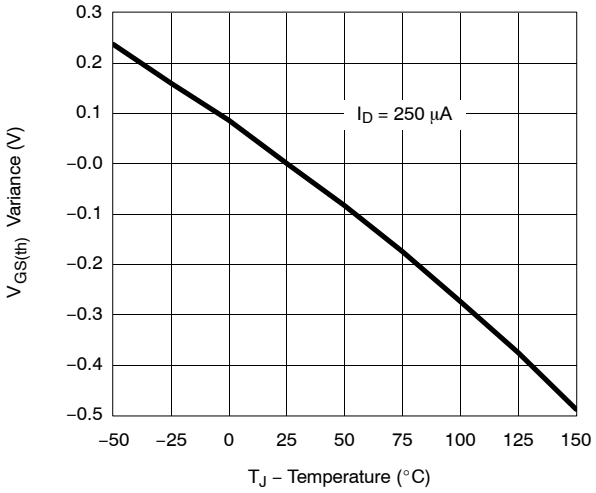
Source-Drain Diode Forward Voltage



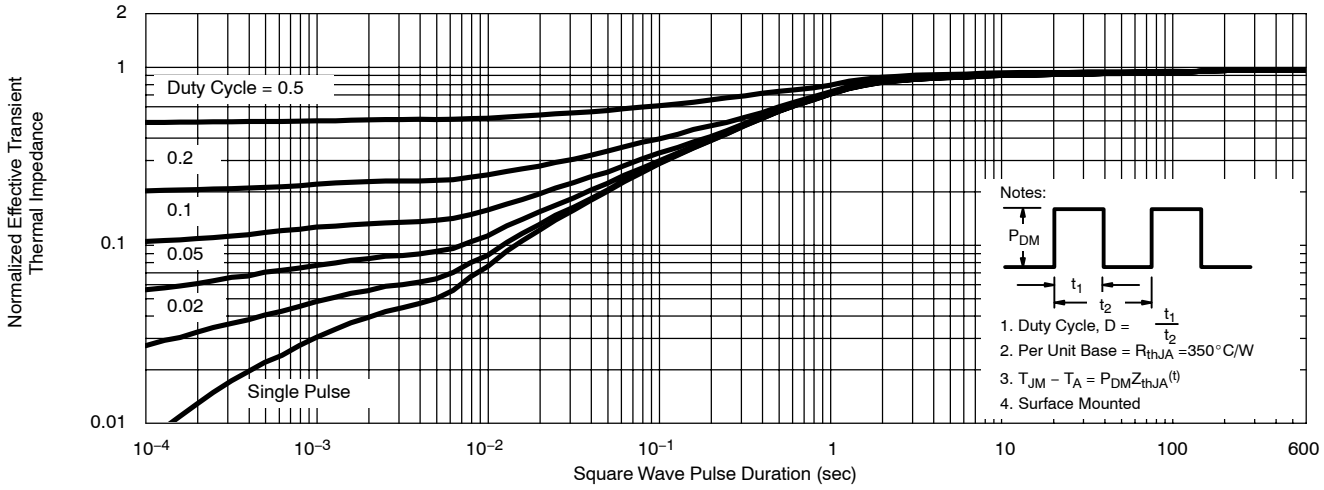
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

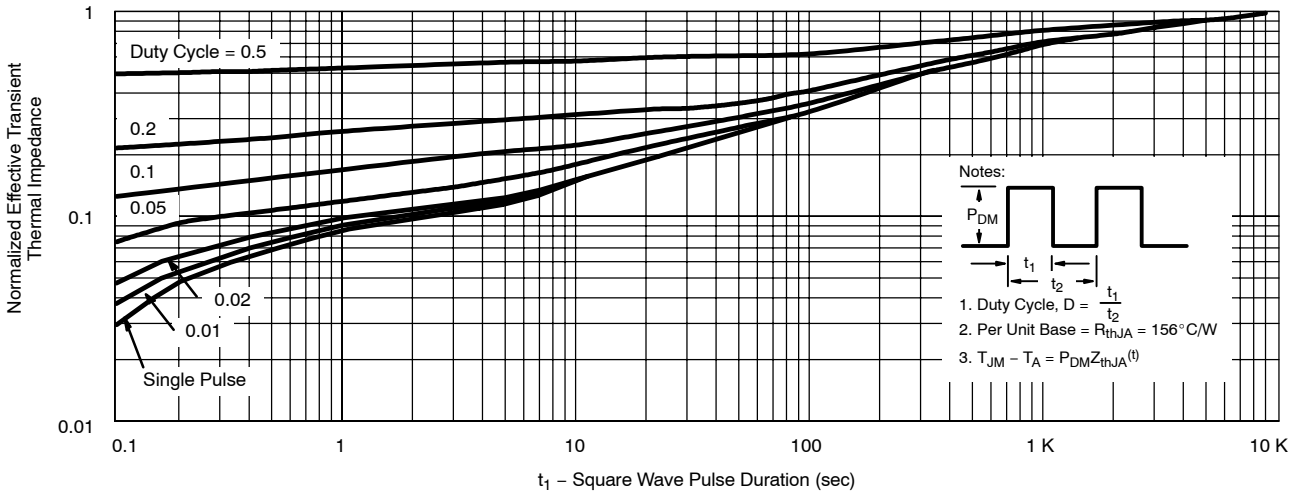


Normalized Thermal Transient Impedance, Junction-to-Ambient (TO-236, TN2404K Only)



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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



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