New Product

P-Channel 60-V (D-S) MOSFET

PRODUCT SUMMARY			
$V_{(BR)DSS(min)}$ (V)	$r_{DS(on)}$ (Ω)	$V_{GS(th)}$ (V)	I_D (A)
−60	6 @ V_{GS} = −10 V	−1 to −3.0	−0.27
	10 @ V_{GS} = −4.5 V		−0.21

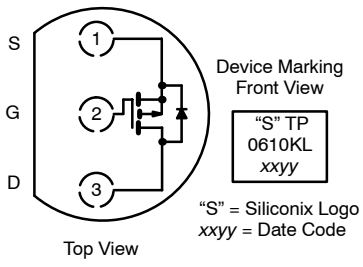
FEATURES

- TrenchFET® Power MOSFET
- ESD Protected: 2000 V

APPLICATIONS

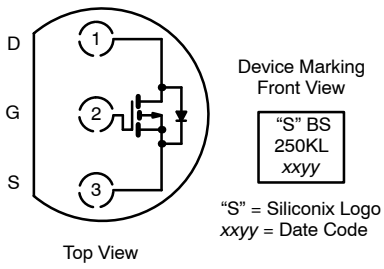
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.
- Battery Operated Systems
- Power Supply, Converter Circuits
- Motor Control

TO-226AA
(TO-92)

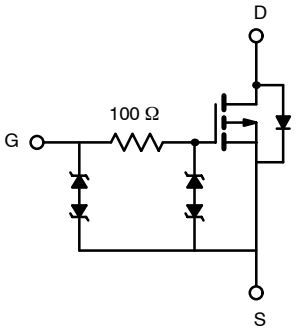


Ordering Information: TP0610KL-TR1

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



Ordering Information: BS250KL-TR1



ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	−60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_A = 25°C	I_D	−0.27	A
	T_A = 70°C		−0.22	
Pulse Drain Current[a]		I_{DM}	−1.0	
Power Dissipation	T_A = 25°C	P_D	0.8	W
	T_A = 70°C		0.51	
Maximum Junction-to-Ambient		R_{thJA}	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.

SPECIFICATIONS (T_A = 25°C UNLESS OTHERWISE NOTED)

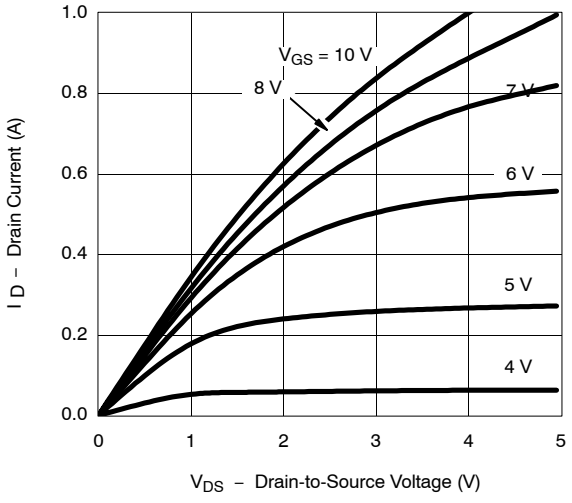
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = −10 μA	−60			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = −250 μA	−1	−2.1	−3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±10	μA
		V_{DS} = 0 V, V_{GS} = ±10 V			±200	nA
		V_{DS} = 0 V, V_{GS} = ±10 V, T_J = 85°C			±500	
		V_{DS} = 0 V, V_{GS} = ±5 V			±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = −60 V, V_{GS} = 0 V			−1	μA
		V_{DS} = −60 V, V_{GS} = 0 V, T_J = 55°C			−10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} = −10 V, V_{GS} = −4.5 V	−50			mA
		V_{DS} = −10 V, V_{GS} = −10 V	−600			
Drain-Source On-Resistance[a]	$r_{DS(on)}$	V_{GS} = −4.5 V, I_D = −25 mA		5.5	10	Ω
		V_{GS} = −10 V, I_D = −500 mA		3.1	6	
		V_{GS} = −10 V, I_D = −500 mA, T_J = 125°C		4.7	9	
Forward Transconductance[a]	g_{fs}	V_{DS} = −10 V, I_D = −100 mA		180		mS
Diode Forward Voltage[a]	V_{SD}	I_S = −200 mA, V_{GS} = 0 V		−0.9	−1.4	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = −30 V, V_{GS} = −15 V, I_D ≅ −500 mA		1.7	3	nC
Gate-Source Charge	Q_{gs}			0.26		
Gate-Drain Charge	Q_{gd}			0.46		
Gate Resistance	R_g			285		Ω
Turn-On Time	$t_{d(on)}$	V_{DD} = −25 V, R_L = 150 Ω I_D ≅ −150 mA, V_{GEN} = −10 V R_g = 10 Ω		2.4	5	ns
	t_r			15.5	25	
Turn-Off Time	$t_{d(off)}$			21	35	
	t_f			12.5	20	

Notes
a. Pulse test: PW ≤300 ms duty cycle ≤2%.
b. Guaranteed by design, not subject to production testing.

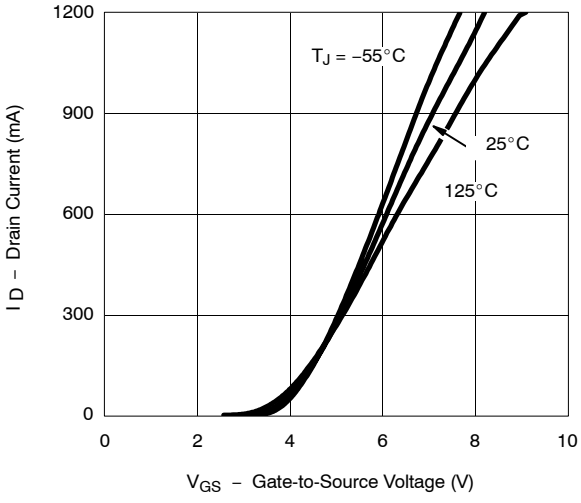
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

For the following graphs, p-channel negative polarities for all voltage and current values are represented as positive values.

Output Characteristics



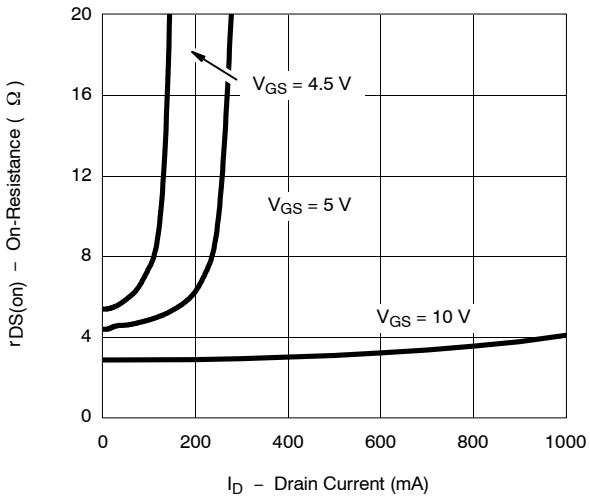
Transfer Characteristics



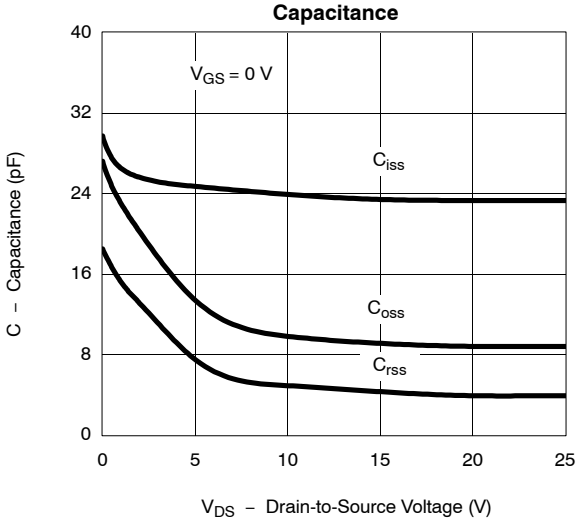
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

For the following graphs, p-channel negative polarities for all voltage and current values are represented as positive values.

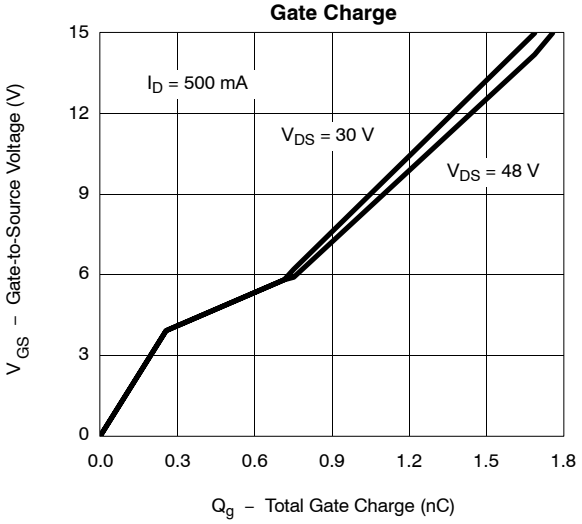
On-Resistance vs. Drain Current



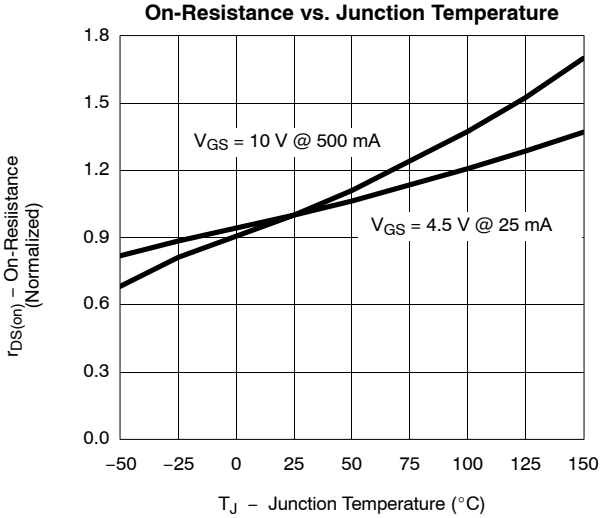
Capacitance



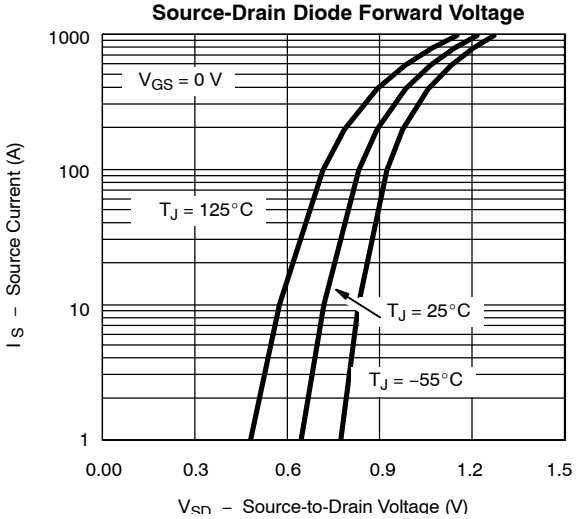
Gate Charge



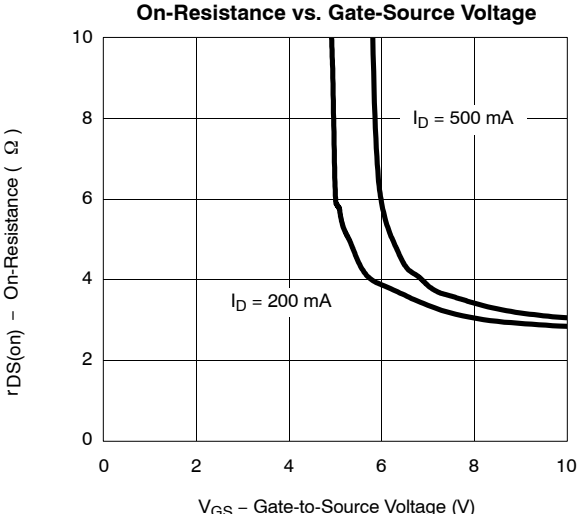
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



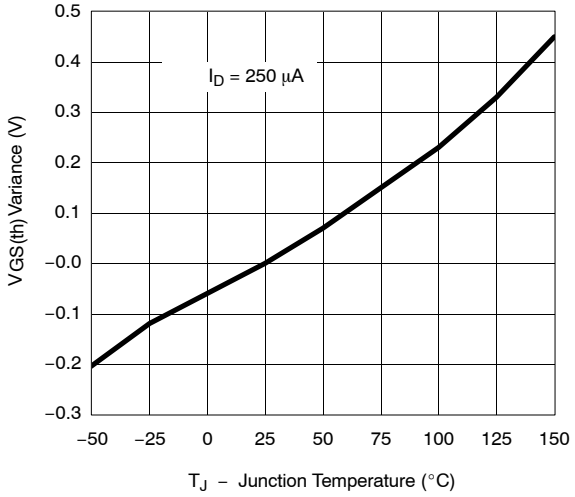
On-Resistance vs. Gate-Source Voltage



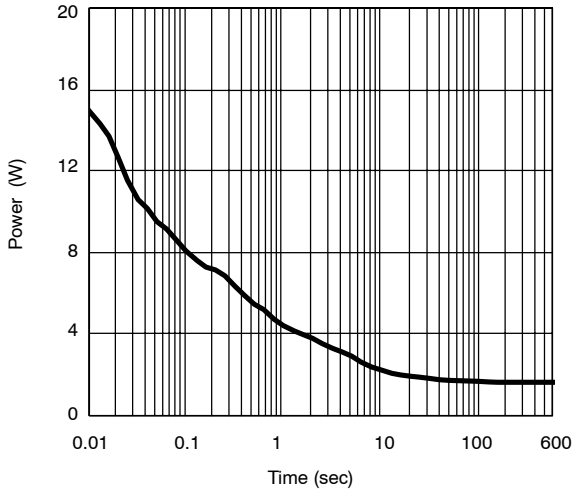
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

For the following graphs, p-channel negative polarities for all voltage and current values are represented as positive values.

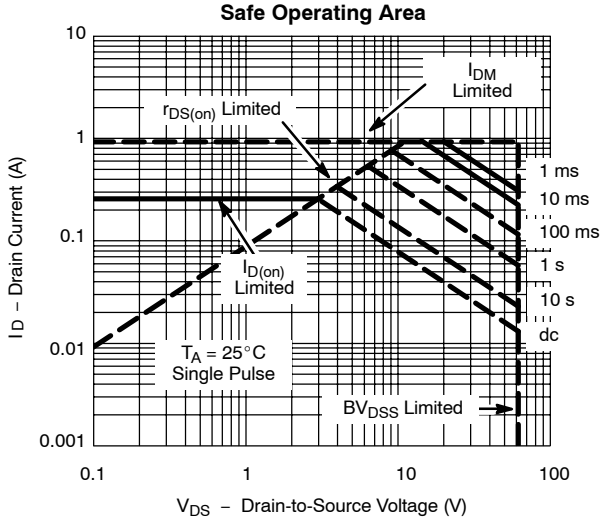
Threshold Voltage Variance Over Temperature



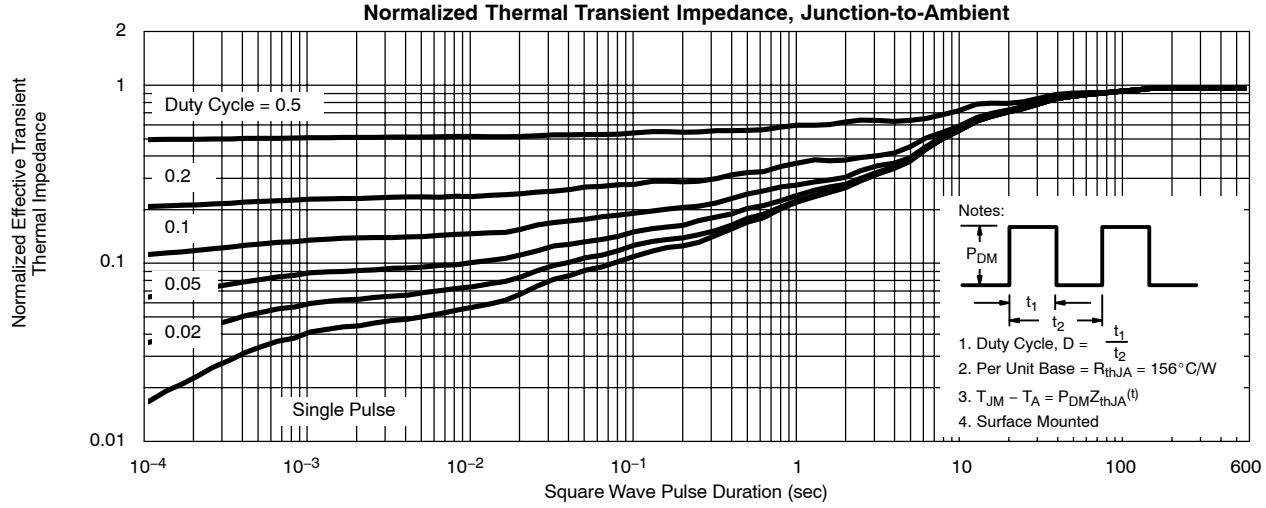
Single Pulse Power, Junction-to-Ambient



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



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