

FEATURES

- 100% UIS and R_g tested
- Advanced planar process

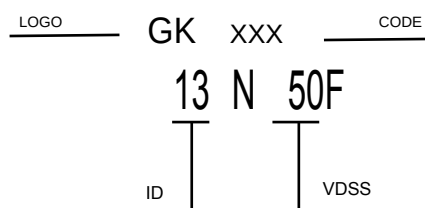
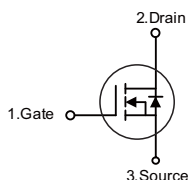
V_{DS} 500 V
 I_D 13 A
 $R_{DS(ON)}$ 0.37 Ω

APPLICATION

- Power Supply
- AC/DC LED Lighting



ITO-220AB



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

PARAMETER	SYMBOL	Limit	UNIT
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current ^(Note 1)	I_D	T _C = 25°C 13	A
		T _C = 100°C 8	
Pulsed Drain Current ^(Note 2)	I_{DM}	52	A
Total Power Dissipation @ T _C = 25°C	P_{DTOT}	57	W
Single Pulse Avalanche Energy ^(Note 3)	E_{AS}	608	mJ
Single Pulse Avalanche Current ^(Note 3)	I_{AS}	7.8	A
Operating Junction and Storage Temperature Range	T _J , T _{STG}	- 55 to +150	°C

THERMAL PERFORMANCE

PARAMETER	SYMBOL	Limit	UNIT
Junction to Case Thermal Resistance	$R_{\theta JC}$	2.2	°C/W
Junction to Ambient Thermal Resistance	$R_{\theta JA}$	62	°C/W

Thermal Performance Note: R_{θJA} is the sum of the junction-to-case and case-to-ambient thermal resistances. The case-thermal reference is defined at the solder mounting surface of the drain pins. R_{θJA} is guaranteed by design while R_{θCA} is determined by the user's board design.

ELECTRICAL SPECIFICATIONS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

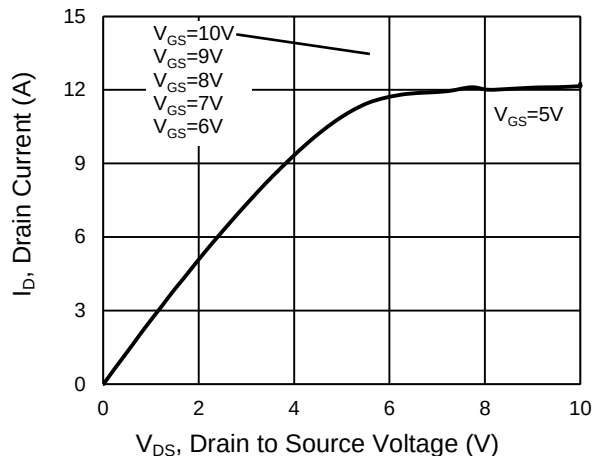
PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNIT
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	500	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	2.5	3	3.8	V
Gate Body Leakage	$V_{GS} = \pm 30V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = 500V, V_{GS} = 0V$	I_{DSS}	--	--	1	μA
Drain-Source On-State Resistance (Note 4)	$V_{GS} = 10V, I_D = 3.3A$	$R_{DS(on)}$	--	0.37	0.48	Ω
Dynamic (Note 5)						
Total Gate Charge	$V_{DS} = 400V, I_D = 6.5A,$ $V_{GS} = 10V$	Q_g	--	39	--	nC
Gate-Source Charge		Q_{gs}	--	10	--	
Gate-Drain Charge		Q_{gd}	--	12	--	
Input Capacitance	$V_{DS} = 50V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	1877	--	pF
Output Capacitance		C_{oss}	--	128	--	
Reverse Transfer Capacitance		C_{rss}	--	7	--	
Gate Resistance		R_g	--	1.1	2.2	Ω
Switching (Note 6)						
Turn-On Delay Time	$V_{DD} = 250V, R_G = 5\Omega,$ $I_D = 6.5A, V_{GS} = 10V$	$t_{d(on)}$	--	11	--	ns
Turn-On Rise Time		t_r	--	21	--	
Turn-Off Delay Time		$t_{d(off)}$	--	32	--	
Turn-Off Fall Time		t_f	--	22	--	
Source-Drain Diode						
Body-Diode Continuous Forward Current		I_S	--	--	13	A
Body-Diode Pulsed Current		I_{SM}	--	--	52	A
Forward Voltage (Note 4)	$I_S = 6.5A, V_{GS} = 0V$	V_{SD}	--	--	1.2	V
Reverse Recovery Time	$I_S = 6.5A$	t_{rr}	--	282	--	ns
Reverse Recovery Charge	$di_F/dt = 100A/\mu s$	Q_{rr}	--	2.9	--	μC

Notes:

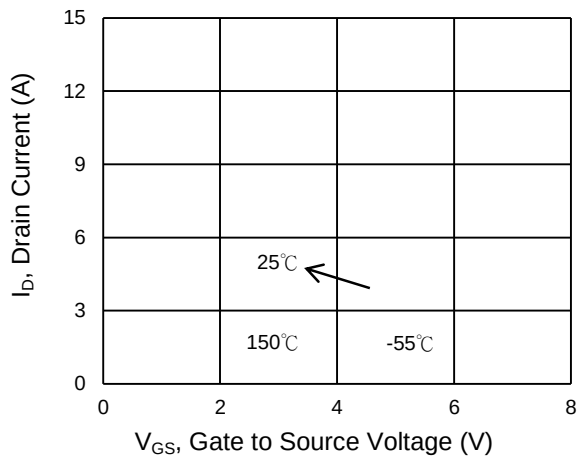
1. Current limited by package
2. Pulse width limited by the maximum junction temperature
3. $L = 20mH, I_{AS} = 7.8A, V_{DD} = 50V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
4. Pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$
5. For DESIGN AID ONLY, not subject to production testing.
6. Switching time is essentially independent of operating temperature.

RATING AND CHARACTERISTIC CURVES

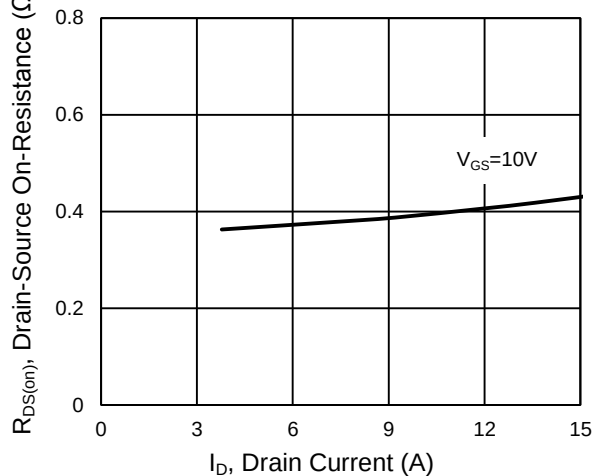
Output Characteristics



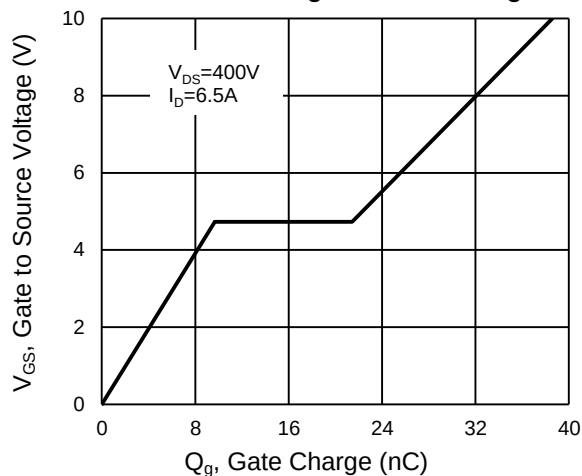
Transfer Characteristics



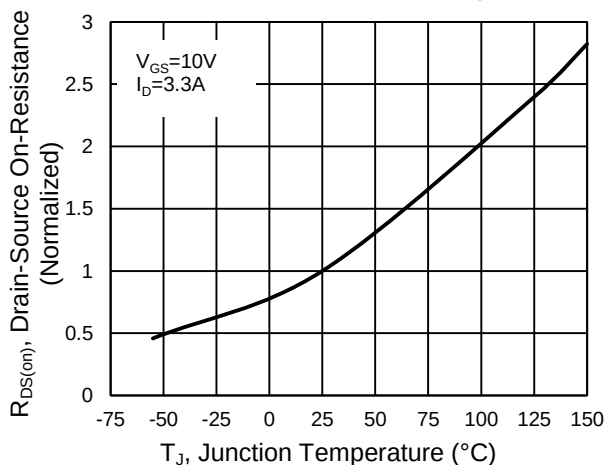
On-Resistance vs. Drain Current



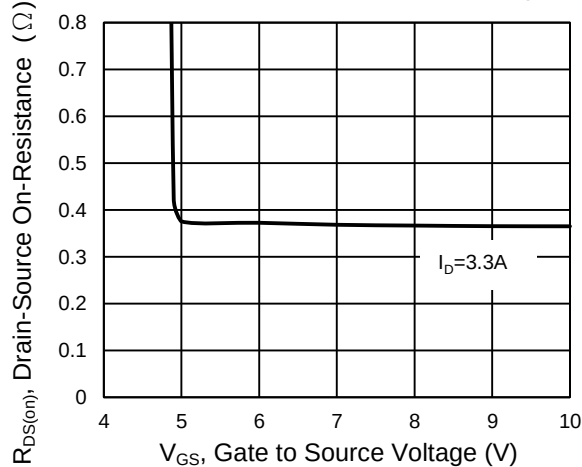
Gate-Source Voltage vs. Gate Charge



On-Resistance vs. Junction Temperature

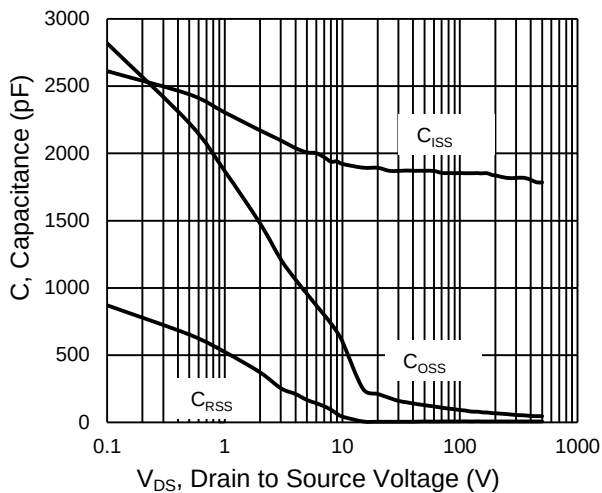


On-Resistance vs. Gate-Source Voltage

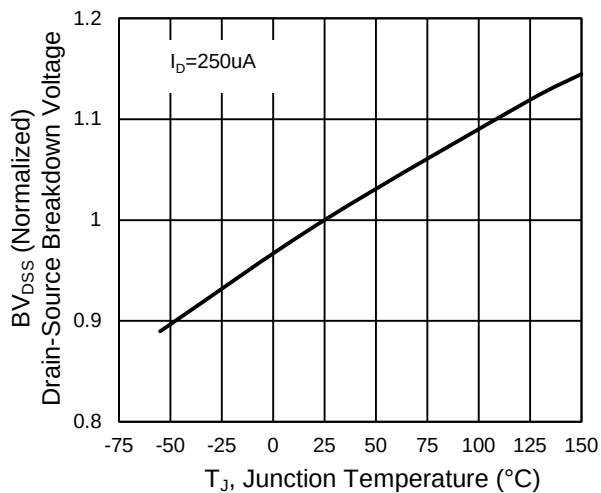


RATING AND CHARACTERISTIC CURVES

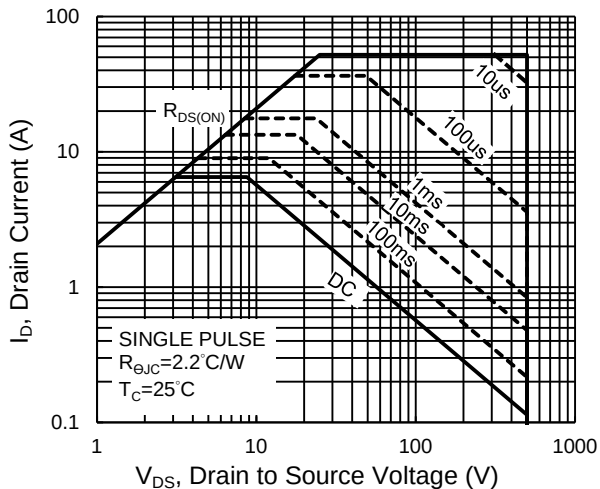
Capacitance vs. Drain-Source Voltage



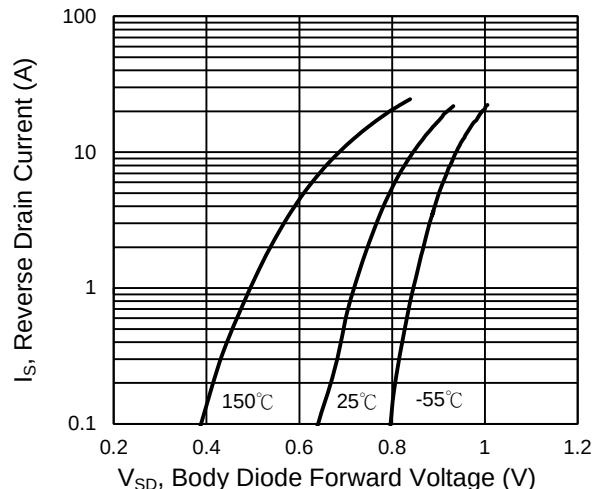
BV_{DSS} vs. Junction Temperature



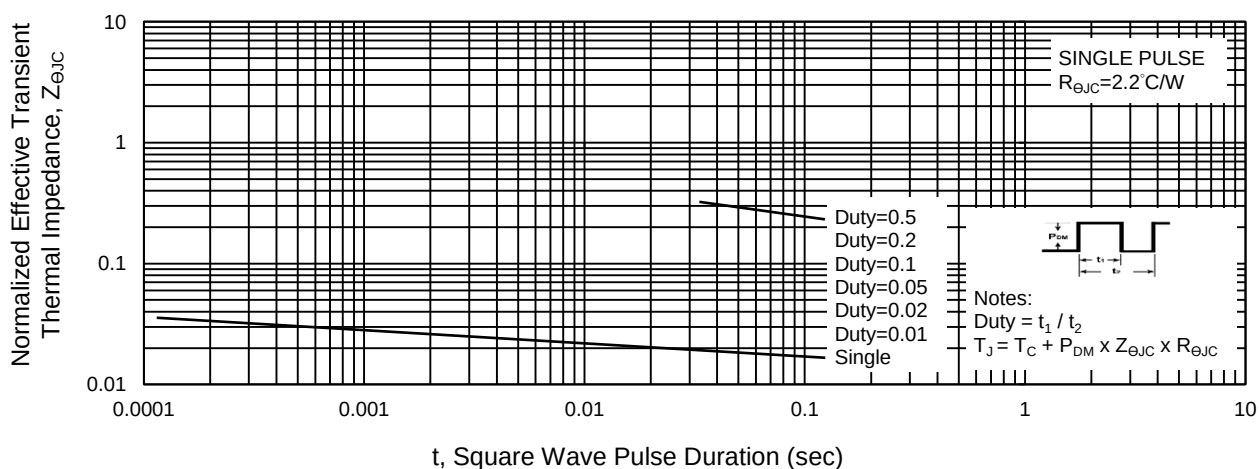
Maximum Safe Operating Area, Junction-to-Case



Source-Drain Diode Forward Current vs. Voltage

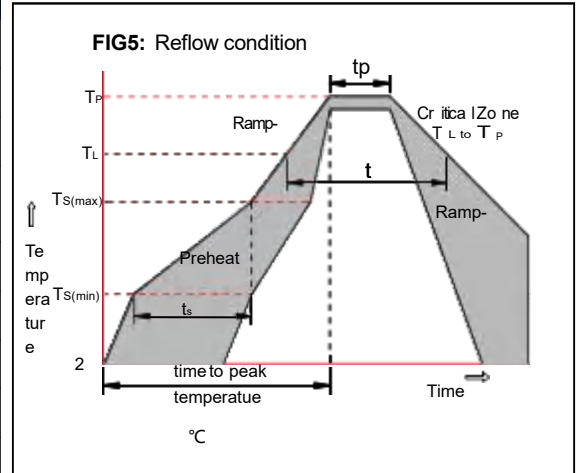


Normalized Thermal Transient Impedance, Junction-to-Case



Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150 °C
	-Temperature Max($T_{s(max)}$)	+200 °C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3 °C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3 °C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217 °C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5) °C
Time within 5 °C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6 °C/sec. Max
Time 25 °C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260 °C



Package Dimensions & Suggested Pad Layout

