GK600R65

N-Channel Super Junction Power MOSFET

V_{DSS}	650 V
I_D	7.3 A
$R_{DS(ON)}$	600 mΩ

FEATURES

650V,7A

$R_{DS(ON)}$ = 0.51Ω (Typ.) @ V_{GS} = 10V, I_D =3.5A

Fast Switching

Improved dv/dt Capability

100% Avalanche Tested

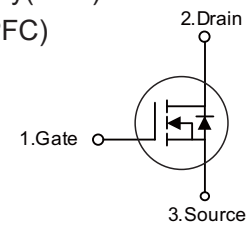
GK XXX
600R65

DESCRIPTION

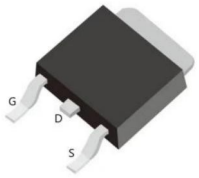
Switch Mode Power Supply(SMPS)

Uninterruptible Power Supply(UPS)

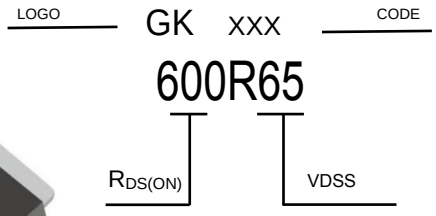
Power Factor Correction (PFC)



Schematic Diagram



TO-252 top view



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit
Drain – Source voltage		V_{DSS}	650	V
Gate – Source voltage		V_{GSS}	±30	V
Continuous drain current	T_C=25°C	I_D	7.3	A
	T_C=100°C		4.6	A
Pulsed drain current(1)		I_{DM}	21.9	A
Power dissipation		P_D	25	W
Single - pulse avalanche energy		E_{AS}	142	mJ
MOSFET dv/dt ruggedness		dv/dt	50	V/ns
Diode dv/dt ruggedness(2)		dv/dt	15	V/ns
Storage temperature		T_{stg}	-55 ~150	℃
Maximum operating junction temperature		T_j	150	℃

1) Pulse width t_P limited by $T_{j,max}$
2) $I_{SD} \leq I_D$, $V_{DS\ peak} \leq V_{(BR)DSS}$

Electrical characteristics (T_J=25℃ unless otherwise noted)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain – Source Breakdown voltage	$V_{(BR)DSS}$	650	-	-	V	V_{GS} = 0V, I_D = 250uA
Gate Threshold Voltage	$V_{GS(th)}$	2	3	4	V	V_{DS} = V_{GS}, I_D = 250uA
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	uA	V_{DS} = 650V, V_{GS} = 0V
Gate Leakage Current	I_{GSS}	-	-	100	nA	V_{GS} = ±30V, V_{DS} = 0V
Drain-Source On State Resistance	$R_{DS(ON)}$	-	0.51	0.60	Ω	V_{GS} = 10V, I_D = 3.5A
Input Capacitance	C_{iss}	-	545	-	pF	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz
Output Capacitance	C_{oss}	-	640	-		
Reverse Transfer Capacitance	C_{rss}	-	28.6	-		
Effective Output Capacitance Energy Related (3)	$C_{o(er)}$	-	18.8	-		V_{DS} = 0V to 520V, V_{GS} = 0V, f = 1.0MHz
Turn On Delay Time	$t_{d(on)}$	-	18	-	ns	V_{GS} = 10V, R_G = 25Ω, V_{DS} = 325V, I_D = 7.3A
Rise Time	t_r	-	33	-		
Turn Off Delay Time	$t_{d(off)}$	-	80	-		
Fall Time	t_f	-	28	-		
Total Gate Charge	Q_g	-	13.8	-	nC	V_{GS} = 10V, V_{DS} = 520V, I_D = 7.3A
Gate – Source Charge	Q_{gs}	-	3.6	-		
Gate – Drain Charge	Q_{gd}	-	5.6	-		
Gate Resistance	R_G	-	20	-	Ω	V_{GS} = 0V, f = 1.0MHz
Continuous Diode Forward Current	I_{SD}	-	-	7.3	A	
Diode Forward Voltage	V_{SD}	-	-	1.4	V	I_{SD} = 7.3A, V_{GS} = 0V
Reverse Recovery Time	t_{rr}	-	272	-	ns	I_{SD} = 7.3A di/dt = 100A/μs V_{DD} = 100V
Reverse Recovery Charge	Q_{rr}	-	3	-	uC	
Reverse Recovery Current	I_{rrm}	-	22.2	-	A	

3) $C_{o(er)}$ is a capacitance that gives the same stored energy as C_{OSS} while V_{DS} is rising from 0V to 80% $V_{(BR)DSS}$

RATING AND CHARACTERISTIC CURVES

Fig.1 On-Region characteristics,

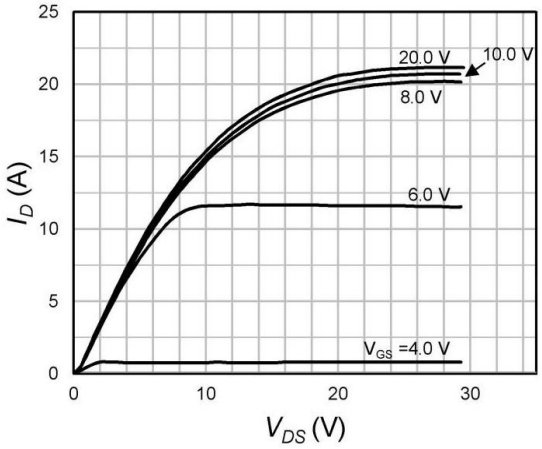


Fig.2 On-resistance Variation with Drain Current and Gate Voltage

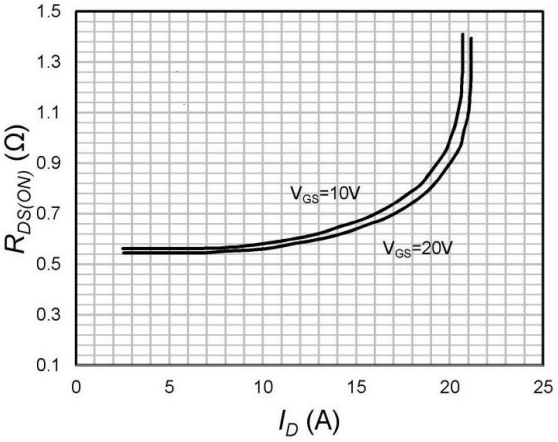


Fig.3 On-Resistance Variation with temprature (Normalized)

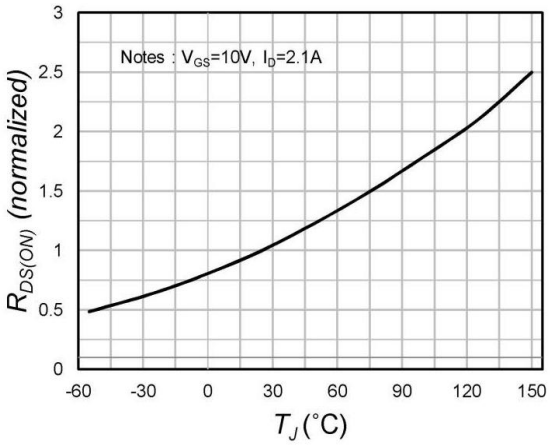


Fig.4 Breakdown Voltage Variation vs. Temperature (Normalized)

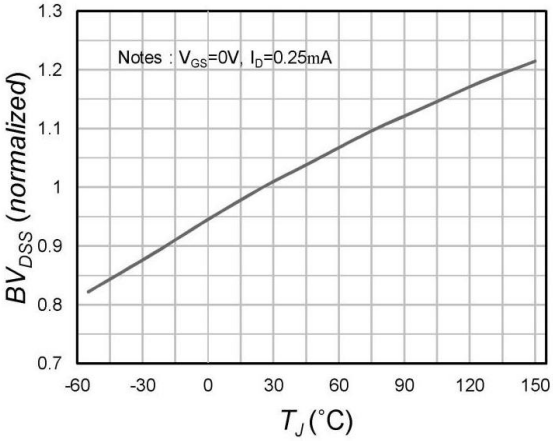


Fig.5 Transfer Characteristics

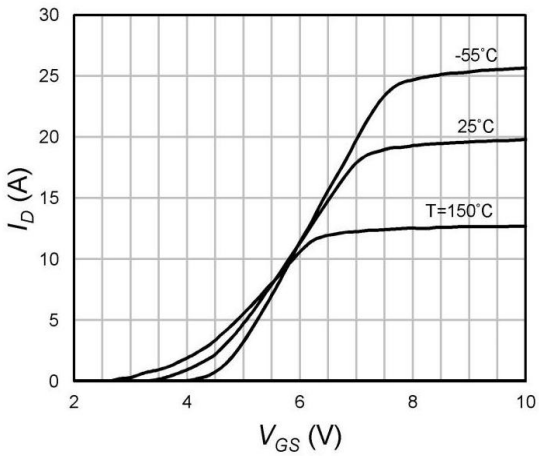
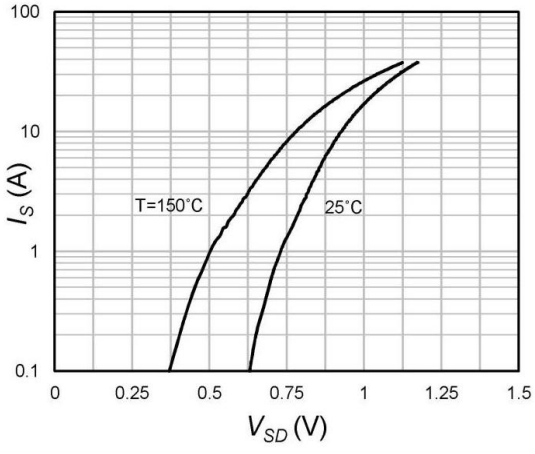


Fig.6 Body Diode Forward Voltage Variation with Source Current and Temperature



RATING AND CHARACTERISTIC CURVES

Fig.7 Gate charge Characteristics

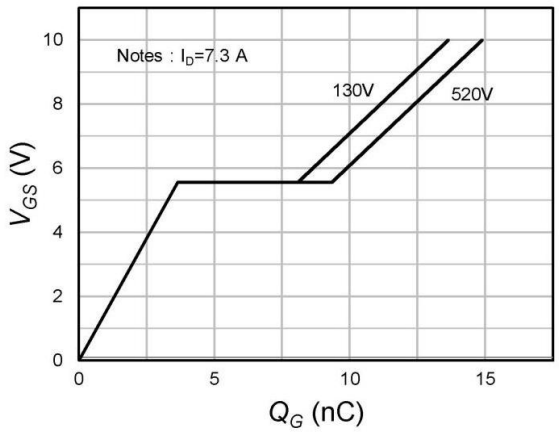


Fig.8 Capacitance Characteristics

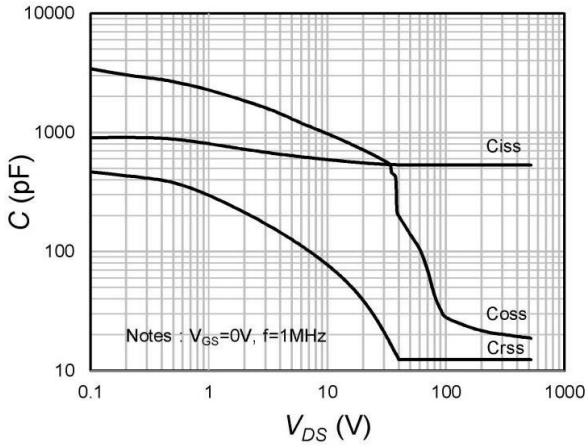


Fig.9 $V_{GS(th)}$ Variation with Temperature (Nomalized)

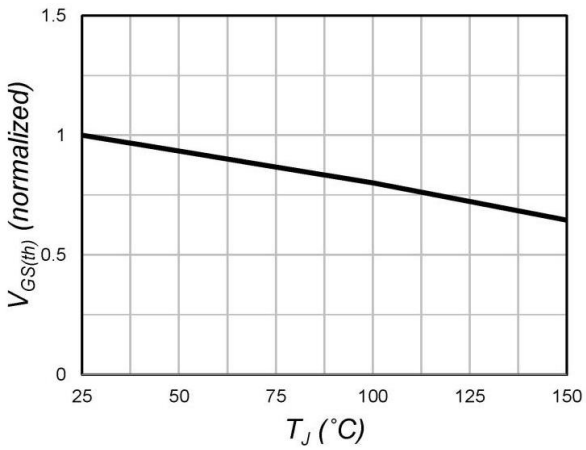


Fig.10 Maximum Drain Current vs. Case Temperature

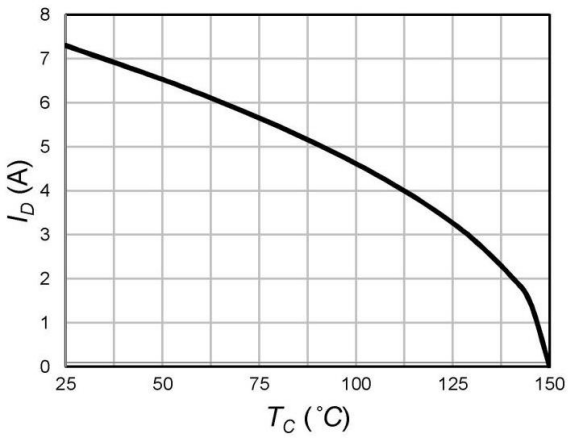


Fig. 11 Single Pulse Maximum Power Dissipation

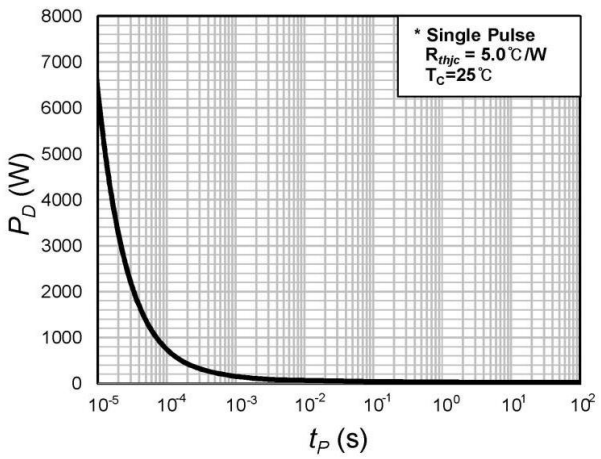
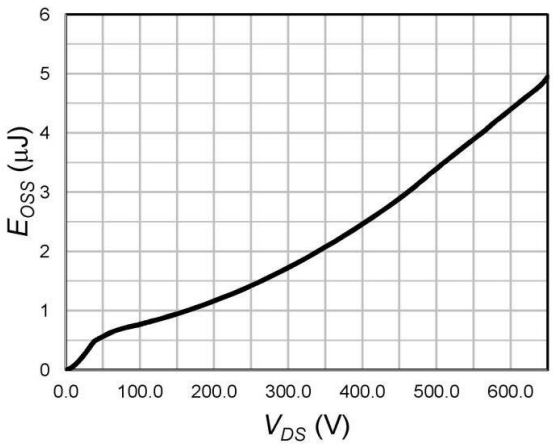


Fig. 12 Output Capacitance Stored Energy



RATING AND CHARACTERISTIC CURVES

Fig.13 Transient Thermal Response Curve

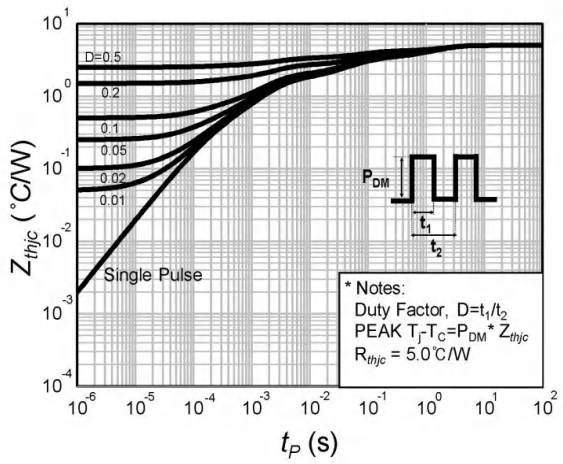
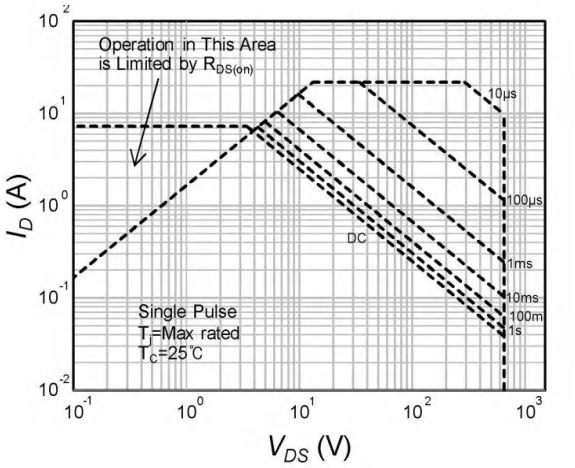


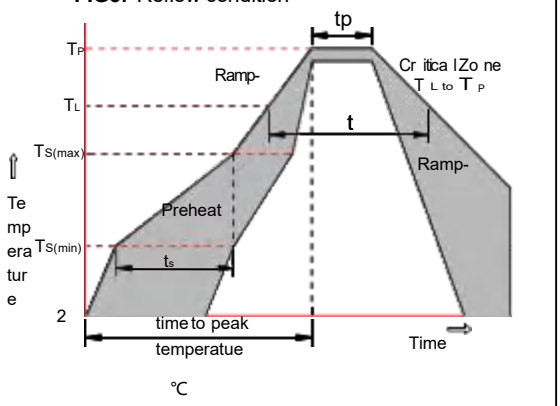
Fig. 14 Maximum Safe Operating Area



Soldering parameters

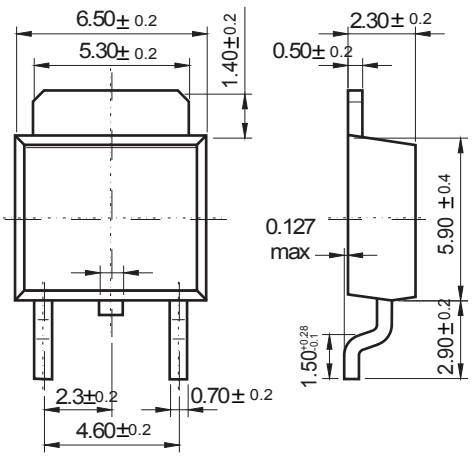
Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid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

FIG5: Reflow condition

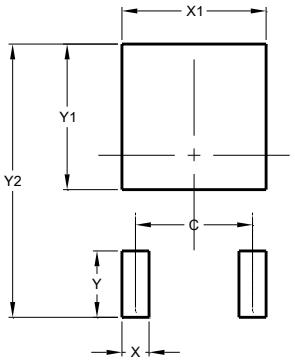


Package Dimensions & Suggested Pad Layout

TO-252



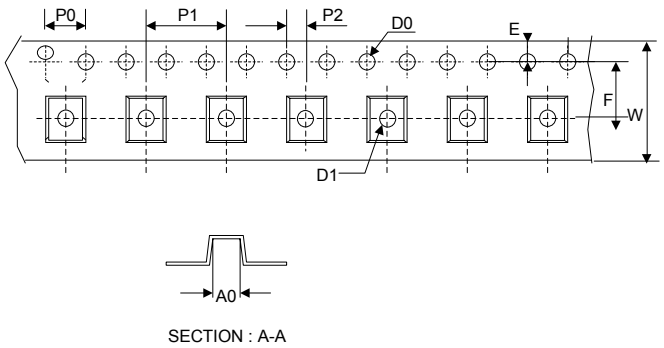
Dimensions in inches and (millimeters)



Dimensions	Value (in mm)
C	4.55
X	1.50
X1	5.80
Y	2.70
Y1	6.00
Y2	10.90

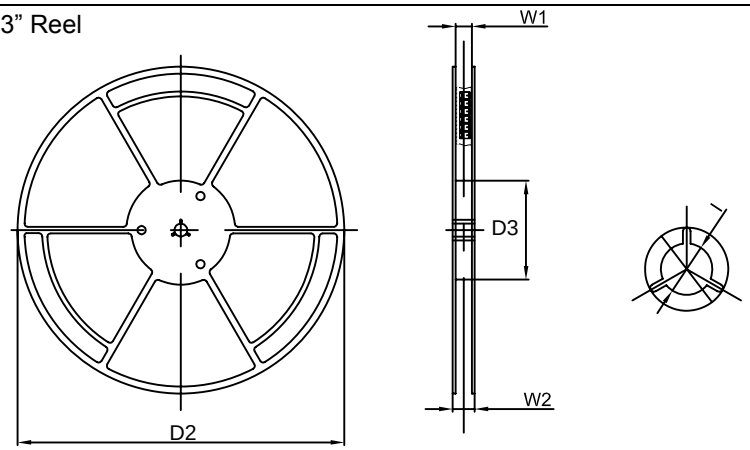
Tape & rell specification

Tape



Symbol	Dimension (mm)
P0	4.00±0.20
P1	8.00±0.20
P2	2.00±0.20
D0	1.55±0.15
D1	1.55±0.20
E	1.75±0.20
F	7.50±0.20
W	16.00±0.20
A0	7.10±0.20
B0	10.50±0.20
K0	2.70±0.20
T	0.30±0.10

13” Reel



D2	330.0±5.0
D3	100.0±4.0
W1	20.0±5.0
W2	25.0±5.0
I	13.0±2.0

Quantity: 2500PCS

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