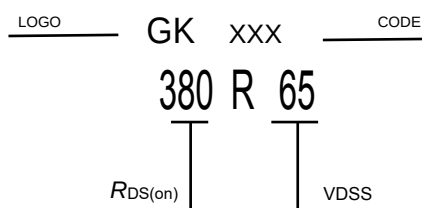
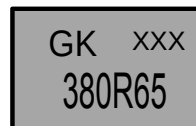


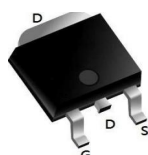
Features

- Drain-Source voltage: $V_{DS}=650V$ (@ $T_J=150^{\circ}C$)
- Low drain-source On resistance: $R_{DS(on)}=0.38\Omega$ (Max.)
- Ultra low gate charge: $Q_g=20nC$ (Typ.)
- RoHS compliant device
- 100% avalanche tested

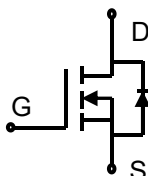
V_{DSS} 650 V
 I_D 11 A
 $R_{DS(ON)}$ 0.38 Ω



TO-252



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute maximum ratings ($T_C=25^{\circ}C$ unless otherwise noted)

Characteristic	Symbol	Rating	Unit
Drain-source voltage	V_{DSS}	650	V
Gate-source voltage	V_{GSS}	± 30	V
Drain current (DC) (Note 1)	I_D	$T_C=25^{\circ}C$	11 A
		$T_C=100^{\circ}C$	7 A
Drain current (Pulsed) (Note 1)	I_{DM}	44	A
Single pulsed avalanche energy (Note 2)	E_{AS}	135	mJ
Repetitive avalanche current (Note 1)	I_{AR}	5	A
Repetitive avalanche energy (Note 1)	E_{AR}	63.2	mJ
Power dissipation	P_D	32	W
Diode dv/dt ruggedness (Note 3)	dv/dt	15	V/ns
MOSFET dv/dt ruggedness (Note 4)	dv/dt	50	V/ns
Junction temperature	T_J	150	$^{\circ}C$
Storage temperature range	T_{stg}	-55~150	$^{\circ}C$

Thermal Characteristics

Characteristic	Symbol	Rating	Unit
Thermal resistance, junction to case	$R_{th(j-c)}$	Max. 3.9	$^{\circ}C/W$
Thermal resistance, junction to ambient	$R_{th(j-a)}$	Max. 62.5	

Electrical Characteristics ($T_J=25^{\circ}\text{C}$ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Drain-source breakdown voltage	BV_{DSS}	$I_D=250\mu\text{A}$, $V_{GS}=0$	650	-	-	V
Gate threshold voltage	$V_{GS(th)}$	$I_D=250\mu\text{A}$, $V_{DS}=V_{GS}$	2	3	4	V
Drain-source cut-off current	I_{DSS}	$V_{DS}=650\text{V}$, $V_{GS}=0\text{V}$	-	-	1	μA
		$V_{DS}=650\text{V}$, $T_J=125^{\circ}\text{C}$	-	-	100	μA
Gate leakage current	I_{GSS}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 30\text{V}$	-	-	± 100	nA
Drain-source on-resistance	$R_{DS(ON)}$	$V_{GS}=10\text{V}$, $I_D=5.5\text{A}$	-	0.31	0.38	Ω
Internal gate resistance	R_g	$f=1\text{MHz}$, Open drain	-	21	28	Ω
Input capacitance	C_{iss}	$V_{DS}=25\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	629	787	945	pF
Output capacitance	C_{oss}		344	431	518	
Reverse transfer capacitance	C_{rss}		19	24	29	
Turn-on delay time (Note 3)	$t_{d(on)}$	$V_{DS}=350\text{V}$, $I_D=11\text{A}$, $R_G=25\Omega$	-	17	25	ns
Rise time (Note 3)	t_r		-	14	24	
Turn-off delay time (Note 3)	$t_{d(off)}$		-	40	55	
Fall time (Note 3)	t_f		-	5	8	
Total gate charge (Note 4)	Q_g	$V_{DS}=400\text{V}$, $V_{GS}=10\text{V}$, $I_D=7\text{A}$	-	20	25	nC
Gate-source charge (Note 4)	Q_{gs}		-	6.5	10	
Gate-drain charge (Note 4)	Q_{gd}		-	5	10	

Source-Drain Diode Ratings and Characteristics ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Characteristic	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Source current (DC)	I_S	Integral reverse diode in the MOSFET	-	-	11	A
Source current (Pulsed)	I_{SM}		-	-	44	A
Forward voltage	V_{SD}	$V_{GS}=0\text{V}$, $I_S=11\text{A}$	-	-	1.2	V
Reverse recovery time (Note 3,4)	t_{rr}	$I_S=11\text{A}$, $V_{GS}=0\text{V}$, $di_S/dt=100\text{A}/\mu\text{s}$	-	326	450	ns
Reverse recovery charge (Note 3,4)	Q_{rr}		-	2.8	4.5	μC

Note:

1. Calculated continuous current based on maximum allowable junction temperature
2. $L=10\text{mH}$, $I_{AS}=5\text{A}$, $V_{DD}=50\text{V}$, Starting $T_J=25^{\circ}\text{C}$
3. Guaranteed by design, not subject to production testing
4. Pulse test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$

RATING AND CHARACTERISTIC CURVES

Fig. 1 Typical Output Characteristics

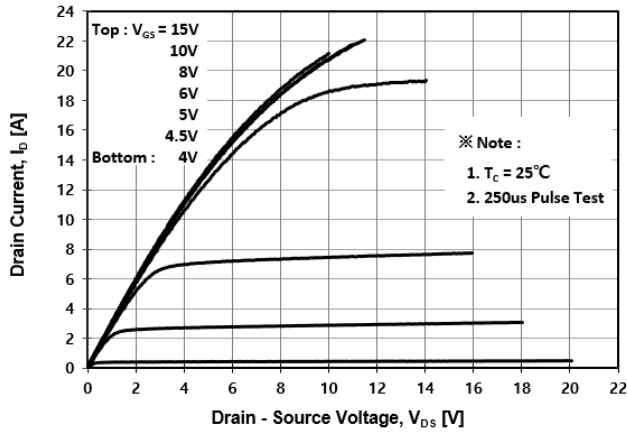


Fig. 2 Typical Transfer Characteristics

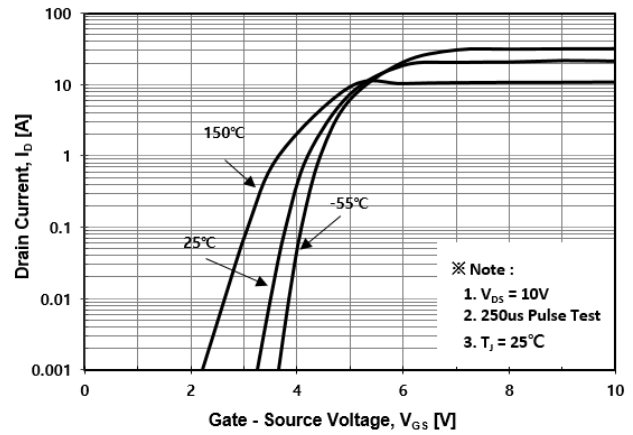


Fig.3 On-Resistance Variation with Drain Current and Gate Voltage

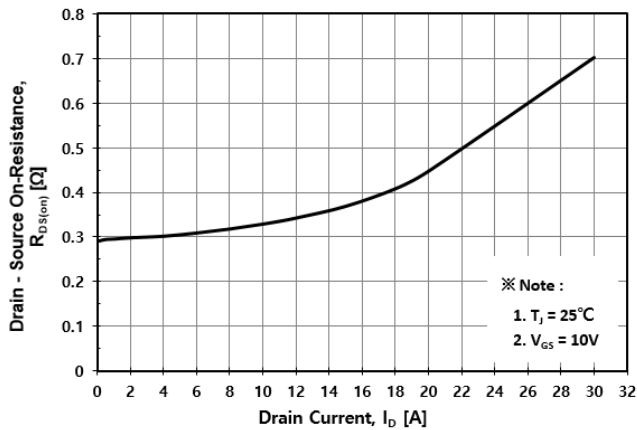


Fig. 4 Body Diode Forward Voltage Variation with Source Current

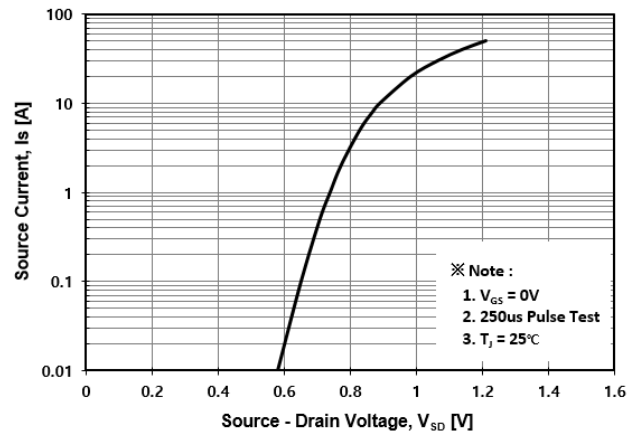


Fig. 5 Typical Capacitance Characteristics

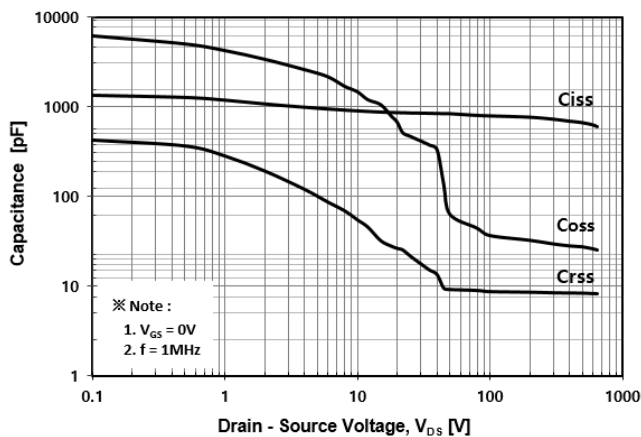
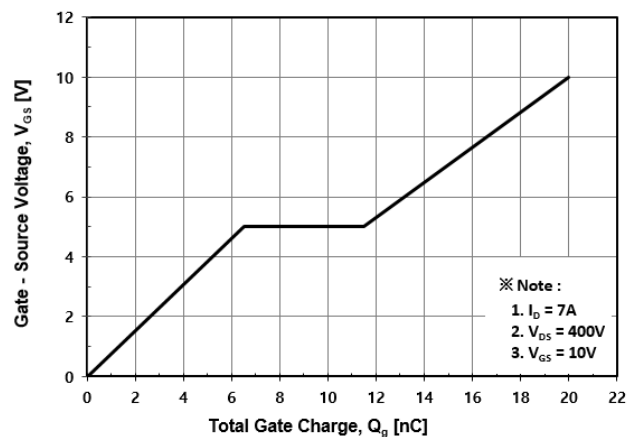


Fig. 6 Typical Total Gate Charge Characteristics



RATING AND CHARACTERISTIC CURVES

Fig. 7 Breakdown Voltage Variation vs. Temperature

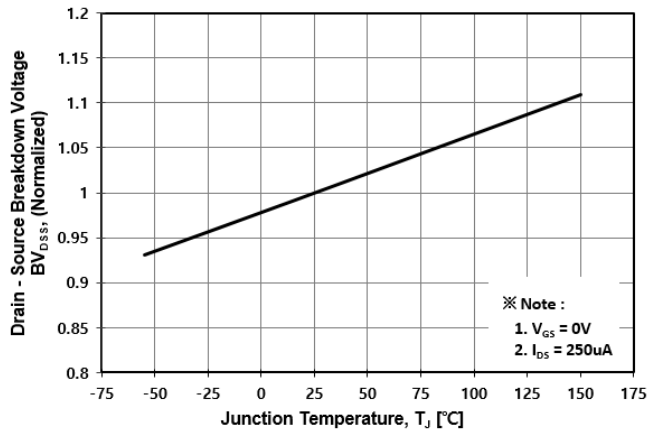


Fig. 8 On-Resistance Variation vs. Temperature

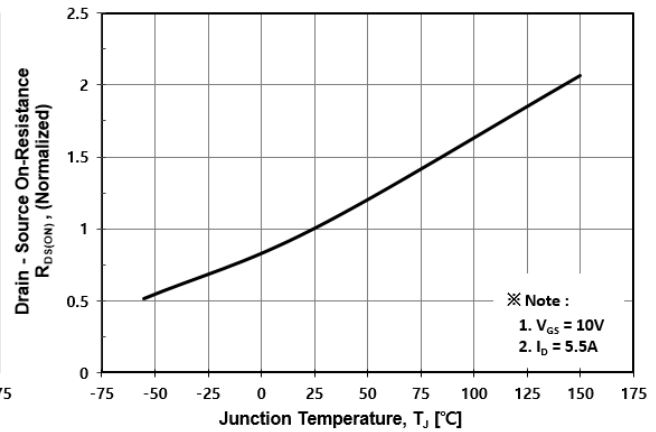


Fig. 9 Maximum Drain Current vs. Case Temperature

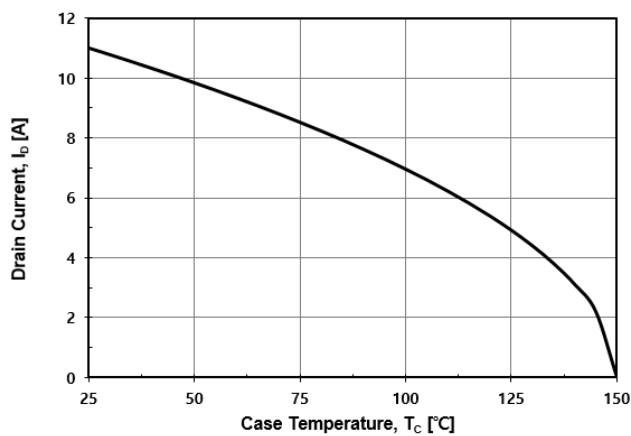


Fig. 10 Maximum Safe Operating Area

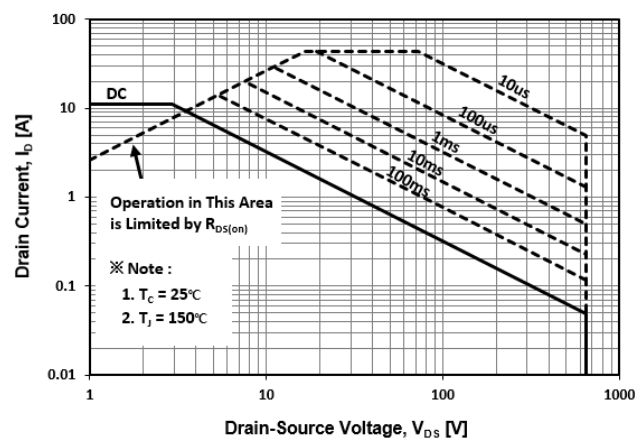
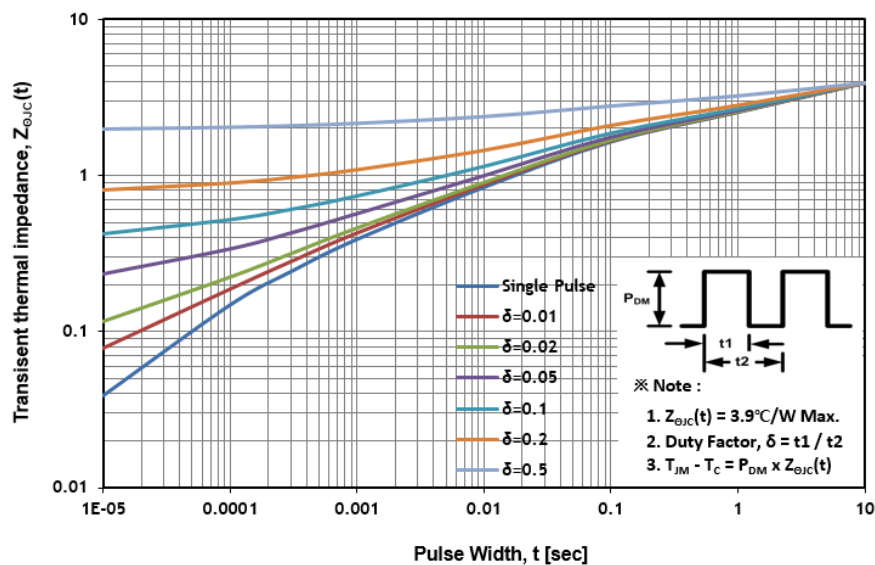
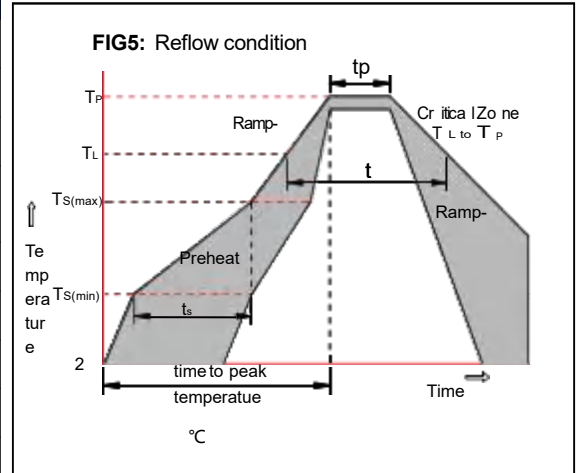


Fig. 11 Transient Thermal Impedance



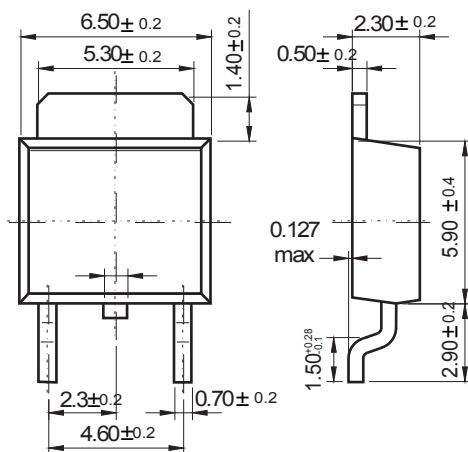
Soldering parameters

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

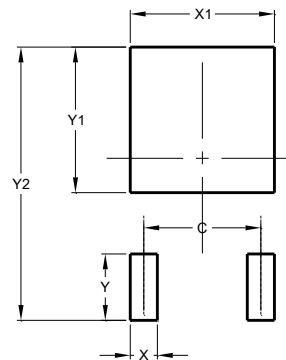


Package Dimensions & Suggested Pad Layout

TO-252



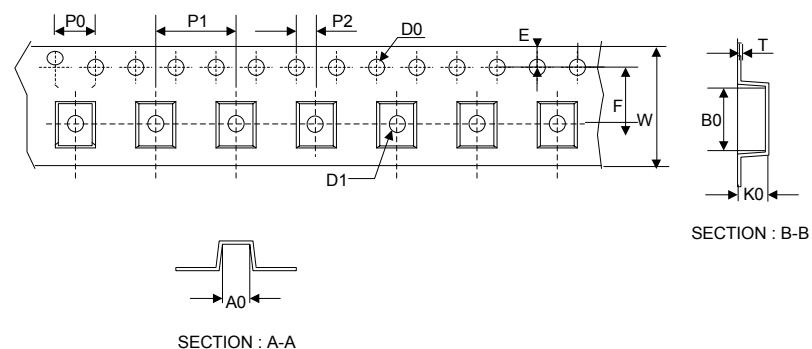
Dimensions in inches and (millimeters)



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

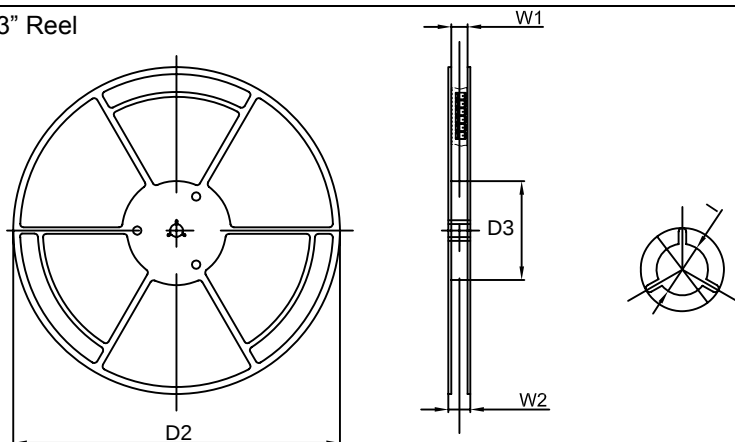
Tape & reel specification

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
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

13" Reel



Quantity: 2500PCS