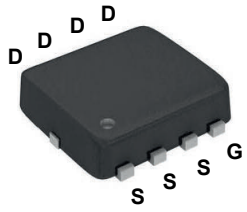
GOOD-ARK SEMICONDUCTOR

GSFN0265

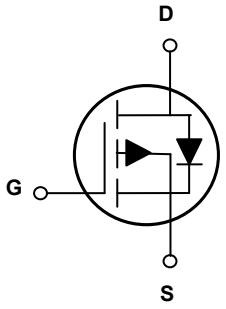
20V P-Channel MOSFET

Main Product Characteristics

BV_{DSS}	-20V
$R_{DS(ON)}$	6.8mΩ (Max.)
I_D	-65A



PPAK3x3



Schematic Diagram

Features and Benefits

- Advanced MOSFET process technology
- Ideal for high efficiency switched mode power supplies
- Low on-resistance with low gate charge
- Fast switching and reverse body recovery

Description

The GSFN0265 utilizes the latest techniques to achieve high cell density and low on-resistance. These features make this device extremely efficient and reliable for use in high efficiency switch mode power supplies and a wide variety of other applications.

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current (T_C=25°C)	I_D	-65	A
Drain Current (T_C=100°C)		-41	A
Peak Drain Current, Pulsed[1]	I_{DM}	-260	A
Single-Pulse Avalanche Current	I_{AS}	-23.8	A
Single-Pulse Avalanche Energy[2]	E_{AS}	141.6	mJ
Total Power Dissipation (T_C=25°C)	P_{tot}	29.7	W
Max. Thermal Resistance from Junction to Case	$R_{\theta JC}$	4.2	°C/W
Max. Thermal Resistance from Junction to Ambient[3]	$R_{\theta JA}$	80	°C/W
Operating Junction and Storage Temperature Range	T_J/T_{STG}	-55 to +150	°C

Notes:

1. See Fig.12 SOA for more detailed information.
2. Limited by $T_{J(MAX)}$, starting T_J=25°C, L=0.5mH, R_g=25Ω, I_{AS}=-23.8A, V_{GS}=-10V.
3. Device mounted on FR-4 substrate PC board, 2oz copper, with 1-inch square copper plate in still air.

Electrical Characteristics (T_A=25°C unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
On / Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	I_D=-250μA	-20	-	-	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=-20V	-	-	-1	μA
Gate Leakage Current	I_{GSS}	V_{GS}=±12V	-	-	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=-250μA	-0.4	-	-1	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS}=-4.5V, I_D=-15A	-	-	6.8	mΩ
		V_{GS}=-2.5V, I_D=-10A	-	-	9	
		V_{GS}=-1.8V, I_D=-8A	-	-	15	
Forward Transconductance	gfs	V_{DS}=-5V, I_D=-10A	-	38	-	S
Dynamic and Switching Characteristics						
Input Capacitance	C_{iss}	V_{DS}=-10V, V_{GS}=0V, f=1MHz	-	3758	-	pF
Output Capacitance	C_{oss}		-	552	-	
Reverse Transfer Capacitance	C_{rss}		-	442	-	
Total Gate Charge	Q_g	V_{GS}=-2.5V, V_{DS}=-10V, I_D=-15A	-	25	-	nC
Total Gate Charge	Q_g	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-15A	-	43	-	
Gate to Source Charge	Q_{gs}		-	6.6	-	
Gate to Drain Charge	Q_{gd}		-	11	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD}=-10V, V_{GS}=-4.5V, I_D=-15A, R_g=3.3Ω	-	17	-	nS
Turn-On Rise Time	t_r		-	63	-	
Turn-Off Delay Time	$t_{d(off)}$		-	120	-	
Turn-Off Fall Time	t_f		-	37	-	
Gate Resistance	R_g	V_{DS}=0V, V_{GS}=0V, f=1MHz	-	13	-	Ω
Source-Drain Ratings and Characteristics						
Drain-Source Diode Forward Voltage	V_{SD}	I_S=-1A, V_{GS}=0V	-	-	-1.2	V
Body-Diode Continuous Current	I_S	-	-	-	-65	A
Body-Diode Continuous Current, Pulsed	I_{SM}	-	-	-	-260	A
Body Diode Reverse Recovery Time	T_{rr}	I_S=-15A, di/dt=100A/μs	-	155	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	224	-	nC

Typical Electrical and Thermal Characteristic Curves

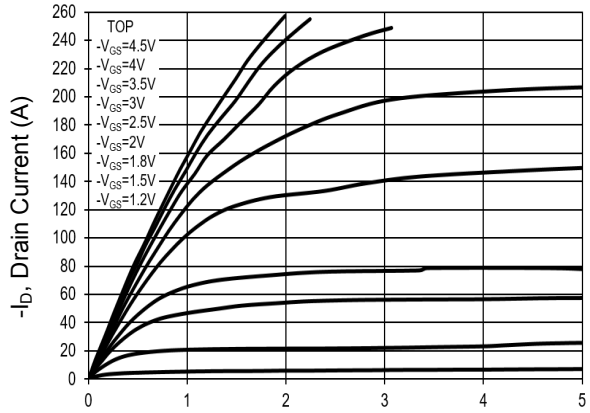


Figure 1. Typical Output Characteristics

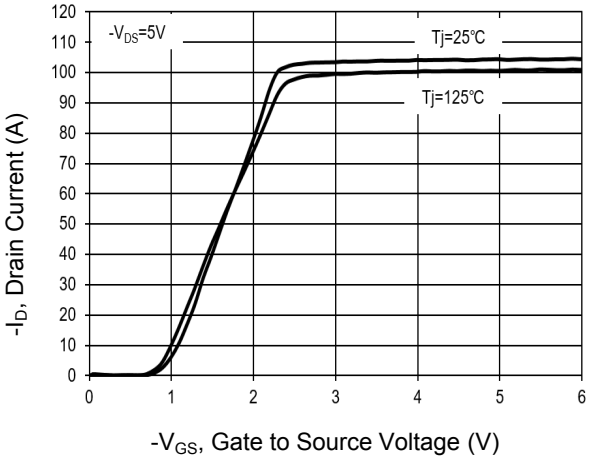


Figure 2. Typical Transfer Characteristics

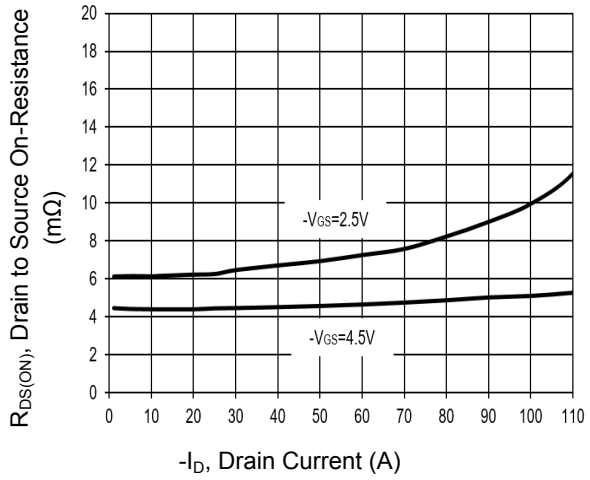


Figure 3. $R_{DS(ON)}$ vs. Drain Current

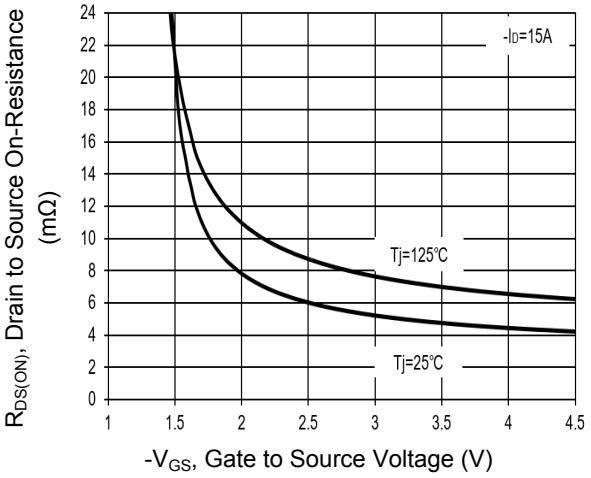


Figure 4. $R_{DS(ON)}$ vs. Gate to Source Voltage

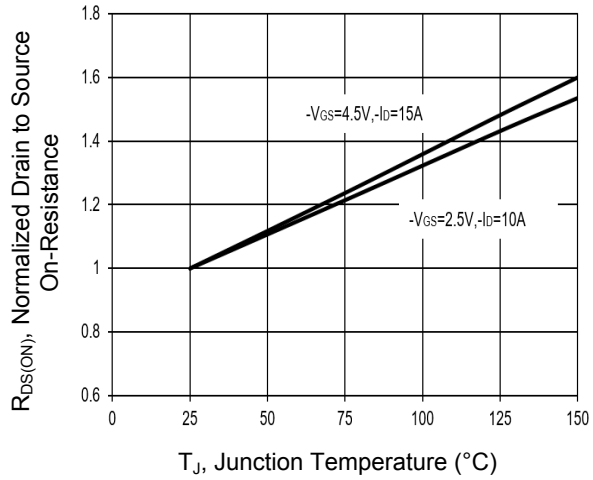


Figure 5. $R_{DS(ON)}$ vs. T_J

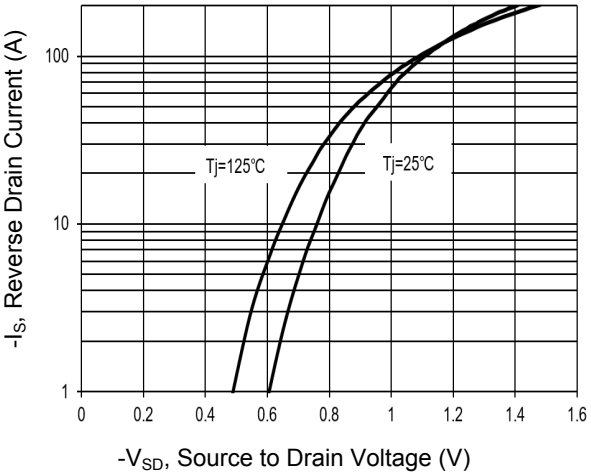


Figure 6. Typical Body-Diode Forward Characteristics

Typical Electrical and Thermal Characteristic Curves

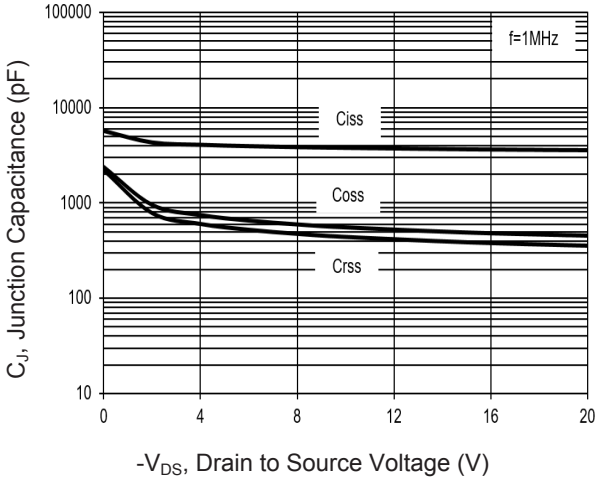


Figure 7. Typical Junction Capacitance

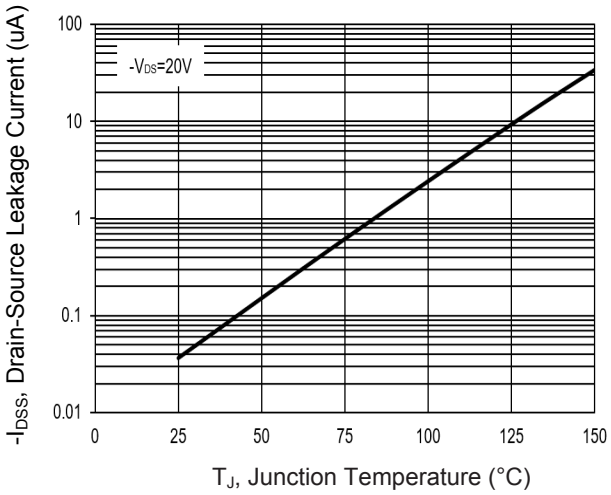


Figure 8. Drain-Source Leakage Current vs. T_J

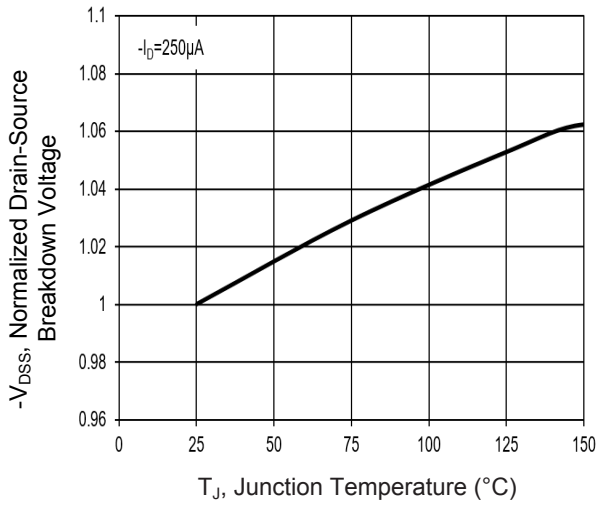


Figure 9. $V_{(BR)DSS}$ vs. T_J

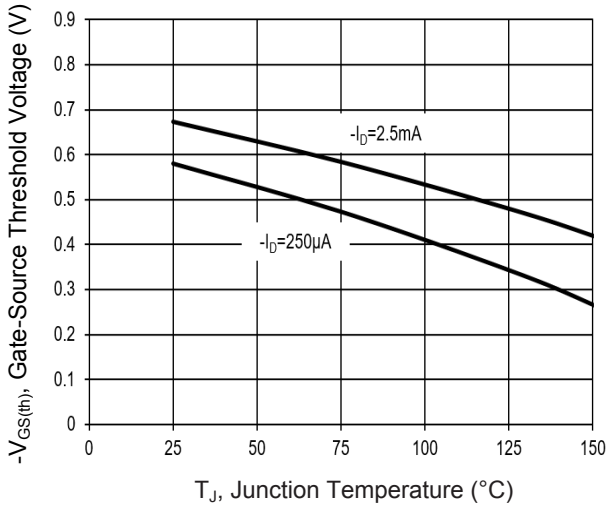


Figure 10. Gate Threshold Variation vs. T_J

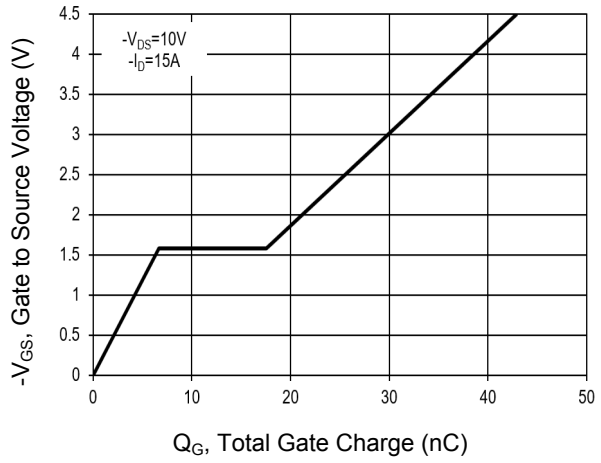


Figure 11. Gate Charge

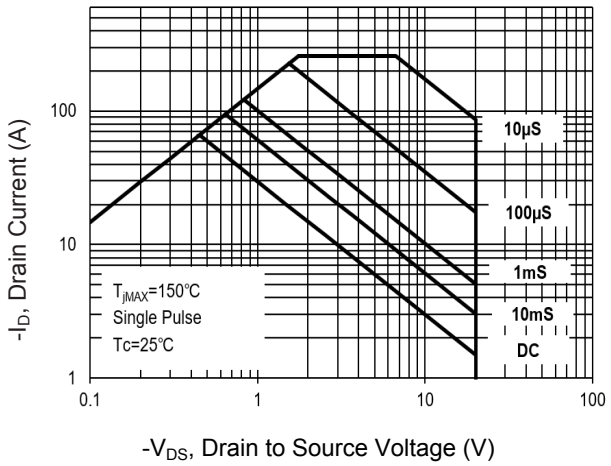


Figure 12. Safe Operation Area

Typical Electrical and Thermal Characteristic Curves

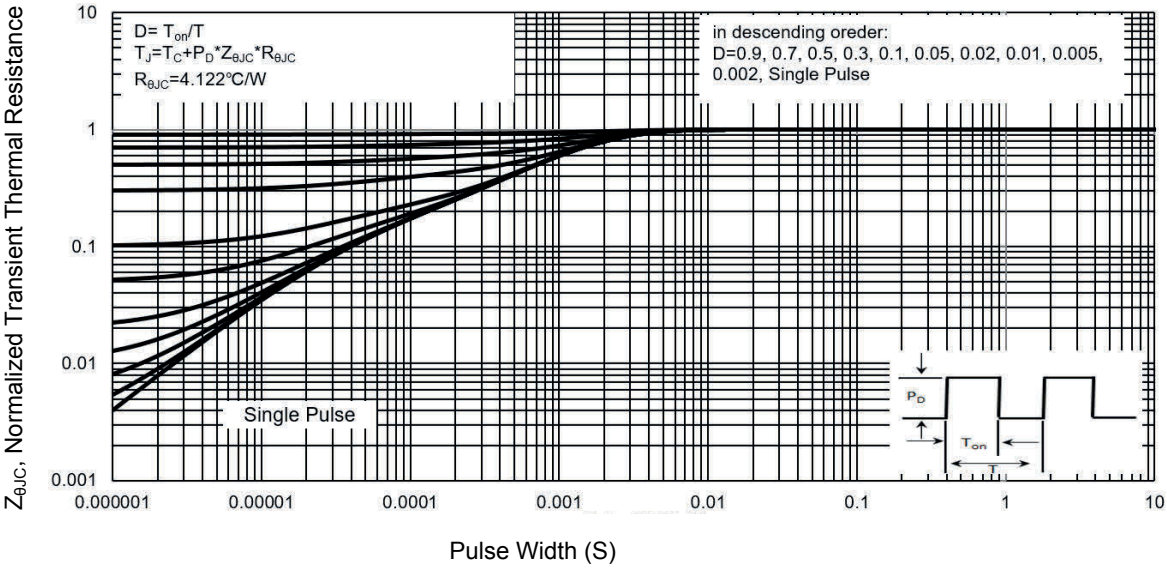


Figure 13. Normalized Maximum Transient Thermal Impedance ($Z_{\theta JC}$)

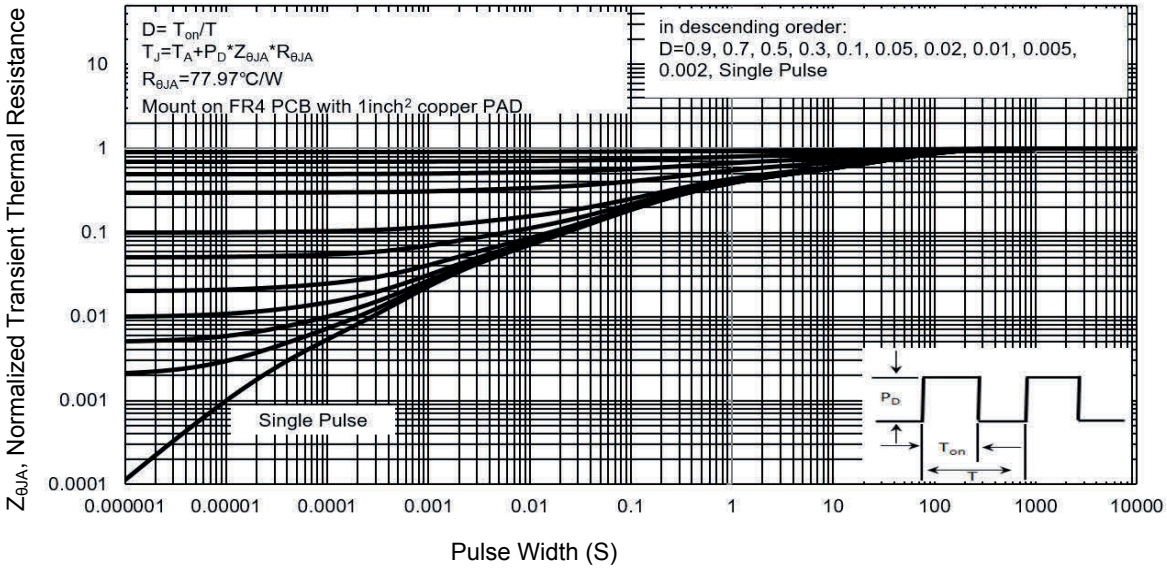
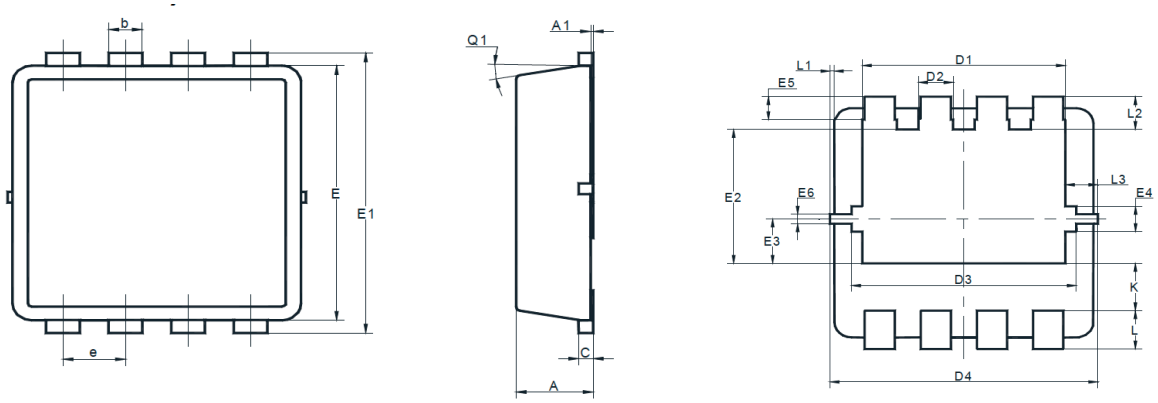


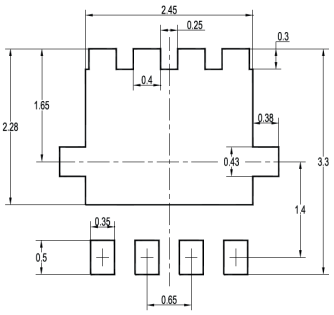
Figure 14. Normalized Maximum Transient Thermal Impedance ($Z_{\theta JA}$)

Package Outline Dimensions (PPAK3x3)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.050	0.000	0.002
b	0.240	0.350	0.009	0.014
c	0.100	0.250	0.004	0.010
D1	2.400	2.600	0.094	0.102
D2	0.300	0.500	0.012	0.020
D3	2.500	2.700	0.098	0.106
D4	3.000	3.200	0.118	0.126
E	2.900	3.100	0.114	0.130
E1	3.100	3.300	0.122	0.122
E2	1.650	1.850	0.065	0.073
E3	0.480	0.680	0.019	0.027
E4	0.230	0.430	0.009	0.017
E5	0.200	0.400	0.008	0.016
E6	0.150	0.250	0.006	0.010
e	0.600	0.700	0.024	0.028
K	0.520	0.720	0.020	0.028
L	0.300	0.500	0.012	0.020
L1	0.000	0.100	0.000	0.004
L2	0.330	0.530	0.013	0.021
L3	0.275	0.475	0.011	0.019
θ1	0°	12°	0°	12°

Recommended Pad Layout



Unit: mm

Order Information

Device	Package	Marking	Carrier	Quantity
GSFN0265	PPAK3x3	068U	Tape & Reel	5,000 pcs / Reel