HUASHUO SEMICONDUCTOR

HSBA1504

N-Ch 150V Fast Switching MOSFETs

General Description

- 100% EAS Guaranteed
- Green Device Available
- Super Low $RDS_{(ON)}$
- Advanced high cell density SGT MOS Technology

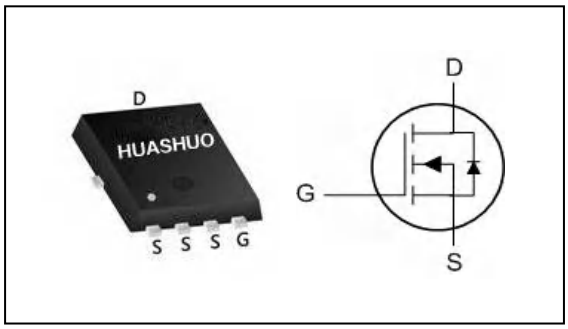
Product Summary

V_{DS}	150	V
$R_{DS(ON),typ}$	9.0	mΩ
I_D	80	A

Applications

- Load Switch
- LED Applications
- PWM Application
- Power Managenmet

PRPAK5*6 Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	150	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	80	A
I_D@T_C=100℃	Continuous Drain Current, V_{GS} @ 10V[1,6]	55	A
I_{DM}	Pulsed Drain Current[2]	320	A
EAS	Single Pulse Avalanche Energy[3]	530	mJ
P_D@T_C=25℃	Total Power Dissipation[4]	100	W
T_{STG}	Storage Temperature Range	-55 to 150	℃
T_J	Operating Junction Temperature Range	-55 to 150	℃

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{\theta JA}$	Thermal Resistance Junction-Ambient [1]	---	50	℃/W
$R_{\theta JC}$	Thermal Resistance Junction-Case[1]	---	0.88	℃/W

Electrical Characteristics (T_J=25 ℃, unless otherwise noted)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V , I_D=250uA	150	---	---	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance[2]	V_{GS}=10V , I_D=20A	---	9.0	11	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS}=V_{DS} , I_D =250uA	2.0	3.0	4.0	V
I_{DSS}	Drain-Source Leakage Current	V_{DS}=120V , V_{GS}=0V , T_J=25℃	---	---	1	uA
		V_{DS}=120V , V_{GS}=0V , T_J=55℃	---	---	5	
I_{GSS}	Gate-Source Leakage Current	V_{GS}=±20V , V_{DS}=0V	---	---	±100	nA
R_g	Gate Resistance	V_{DS}=0V , V_{GS}=0V , f=1MHz	---	3.6	---	Ω
Qg	Total Gate Charge (10V)	V_{DS}=75V , V_{GS}=10V , I_D=20A	---	50	---	nC
Qgs	Gate-Source Charge		---	19	---	
Qgd	Gate-Drain Charge		---	14	---	
Td(on)	Turn-On Delay Time	V_{DD}=75V , V_{GS}=10V , R_G=4.5Ω, R_L=1Ω,I_D=20A	---	17	---	ns
Tr	Rise Time		---	45	---	
Td(off)	Turn-Off Delay Time		---	48	---	
Tf	Fall Time		---	39	---	
Ciss	Input Capacitance	V_{DS}=75V , V_{GS}=0V , f=1MHz	---	3380	---	pF
Coss	Output Capacitance		---	321	---	
Crss	Reverse Transfer Capacitance		---	15	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current[1,5]	V_G=V_D=0V , Force Current	---	---	80	A
V_{SD}	Diode Forward Voltage[2]	V_{GS}=0V , I_S=50A , T_J=25℃	---	---	1.1	V
t_{rr}	Reverse Recovery Time	IF=15A , dI/dt=100A/μs , T_J=25℃	---	118	---	nS
Q_{rr}	Reverse Recovery Charge		---	431	---	nC

Note :
1.The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2.The data tested by pulsed , pulse width ≦ 300us , duty cycle ≦ 2%
3.The power dissipation is limited by 150℃ junction temperature
4.The EAS data shows Max. rating . The test condition is V_{DD}=75V,V_{GS}=10V,L=0.3mH,I_{AS} = 75A.
5.The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.
6.Package limitation current.

Typical Characteristics

Figure 1: Power De-rating

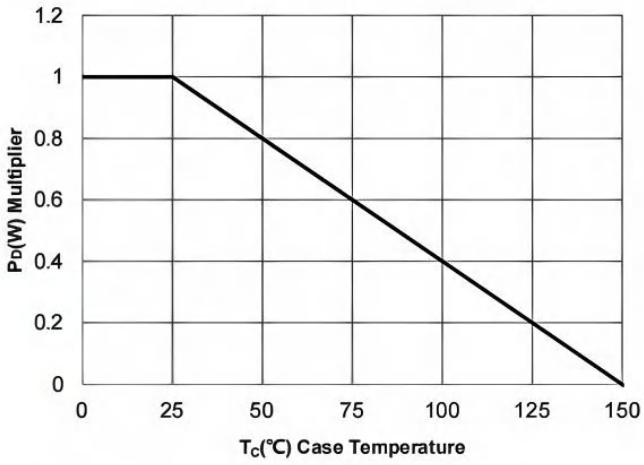


Figure 2: Current De-rating

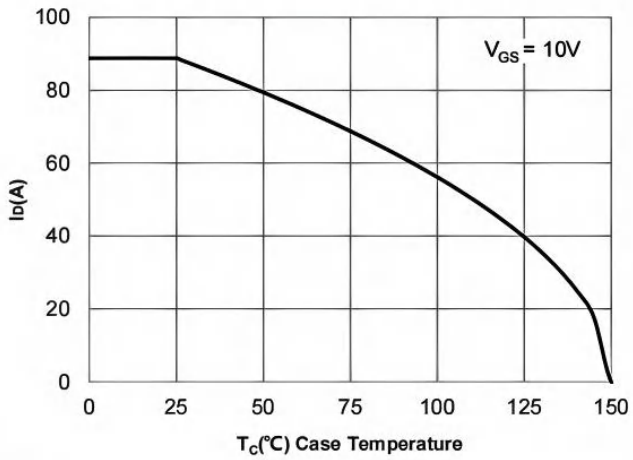


Figure 3: Normalized Maximum Transient Thermal Impedance

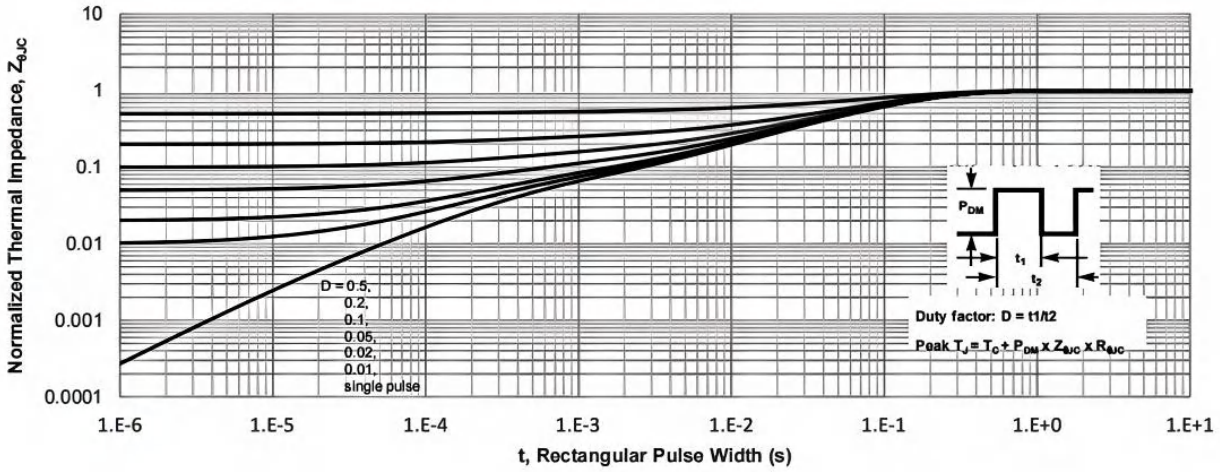


Figure 4: Peak Current Capacity

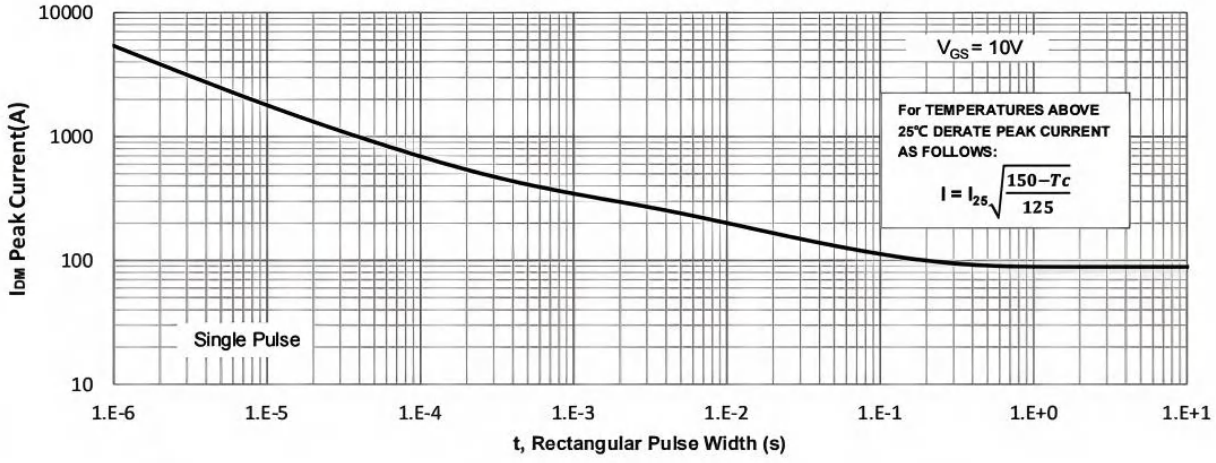


Figure 5: Output Characteristics

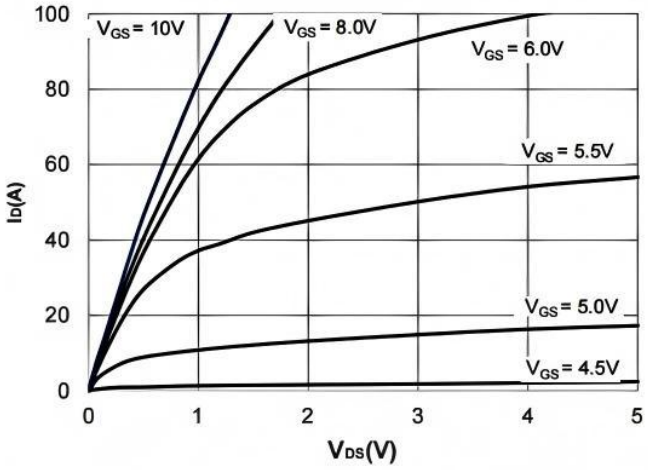


Figure 6: Typical Transfer Characteristics

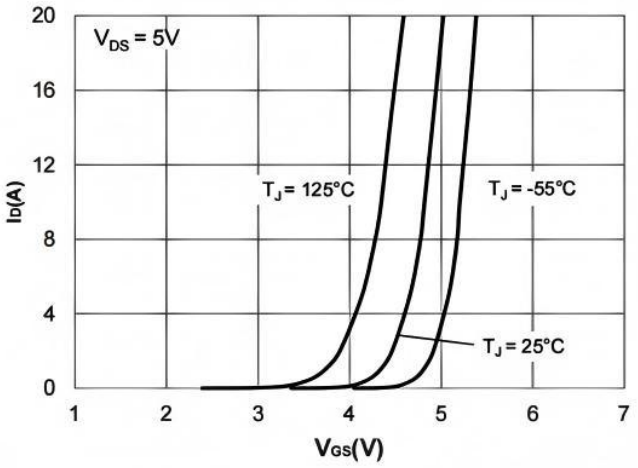


Figure 7: On-resistance vs. Drain Current

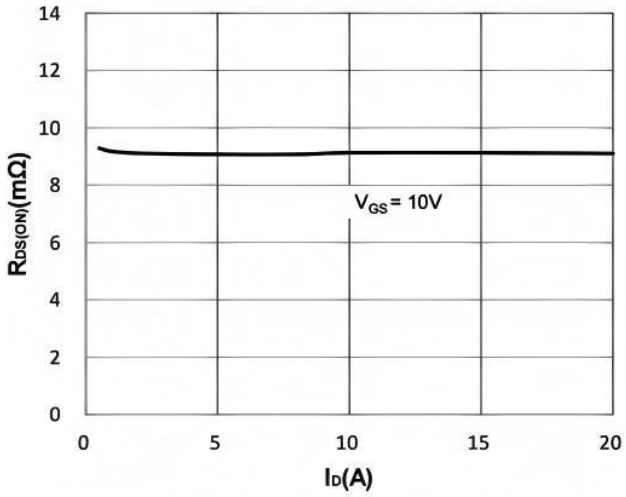


Figure 8: Body Diode Characteristics

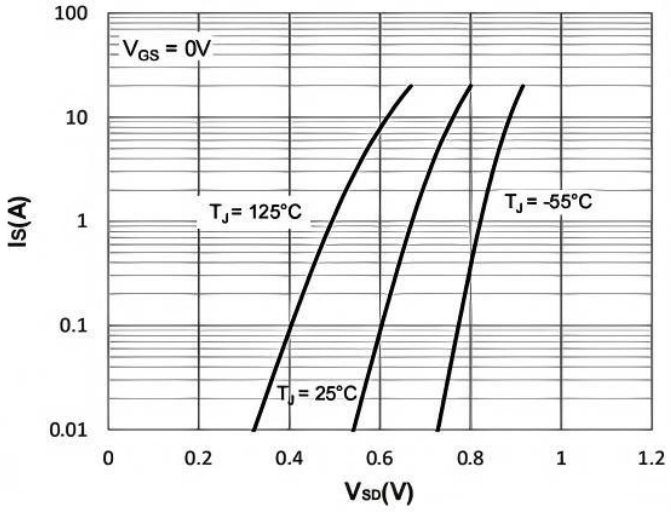


Figure 9: Gate Charge Characteristics

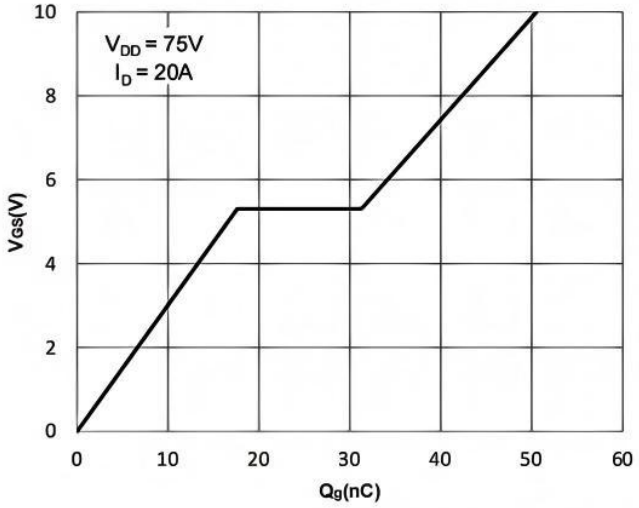


Figure 10: Capacitance Characteristics

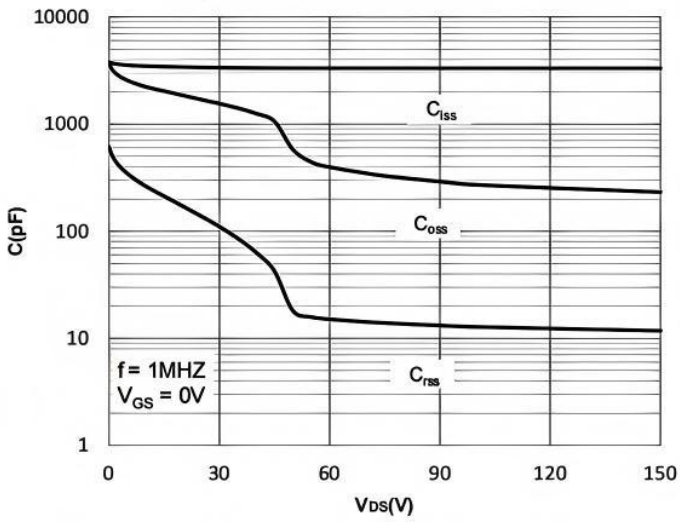


Figure 11: Normalized Breakdown voltage vs. Junction Temperature

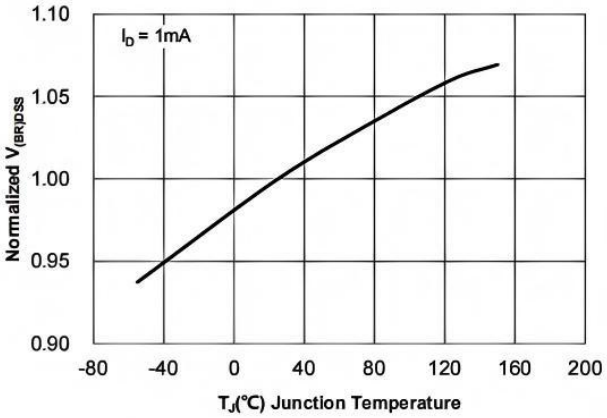


Figure 12: Normalized on Resistance vs. Junction Temperature

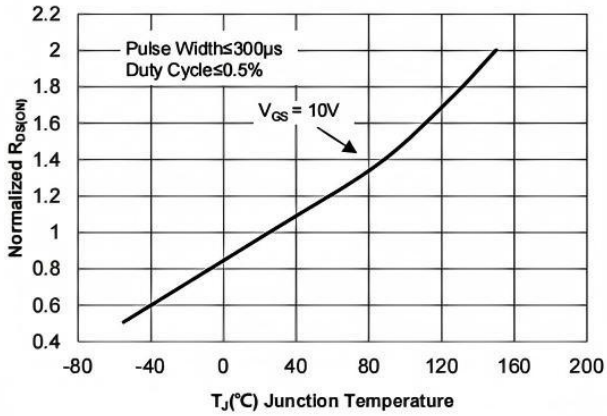


Figure 13: Normalized Threshold Voltage vs. Junction Temperature

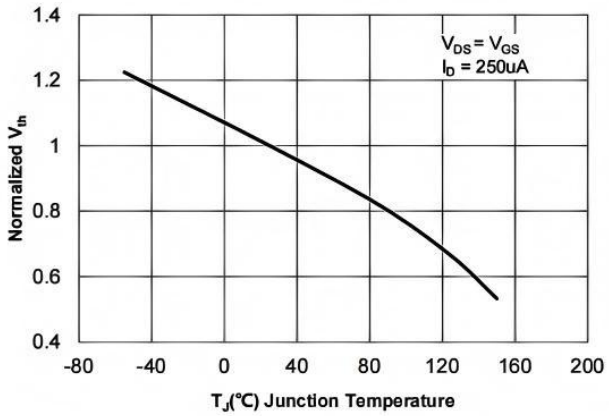


Figure 14: $R_{DS(ON)}$ vs. V_{GS}

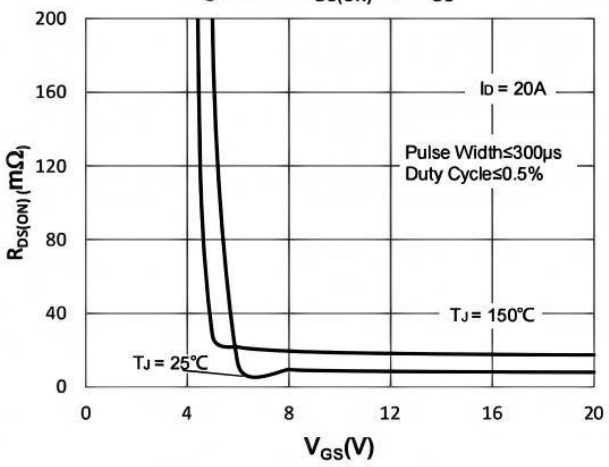
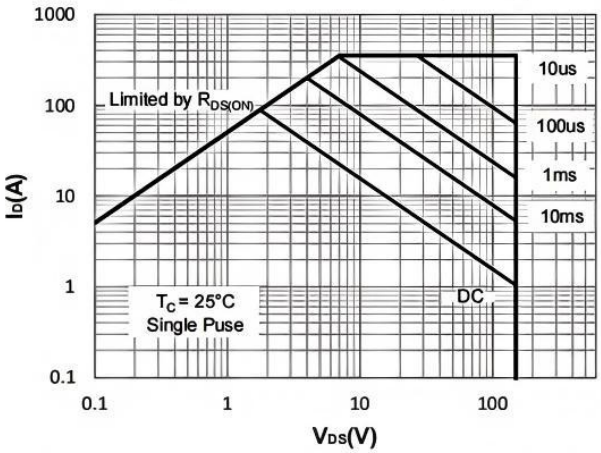


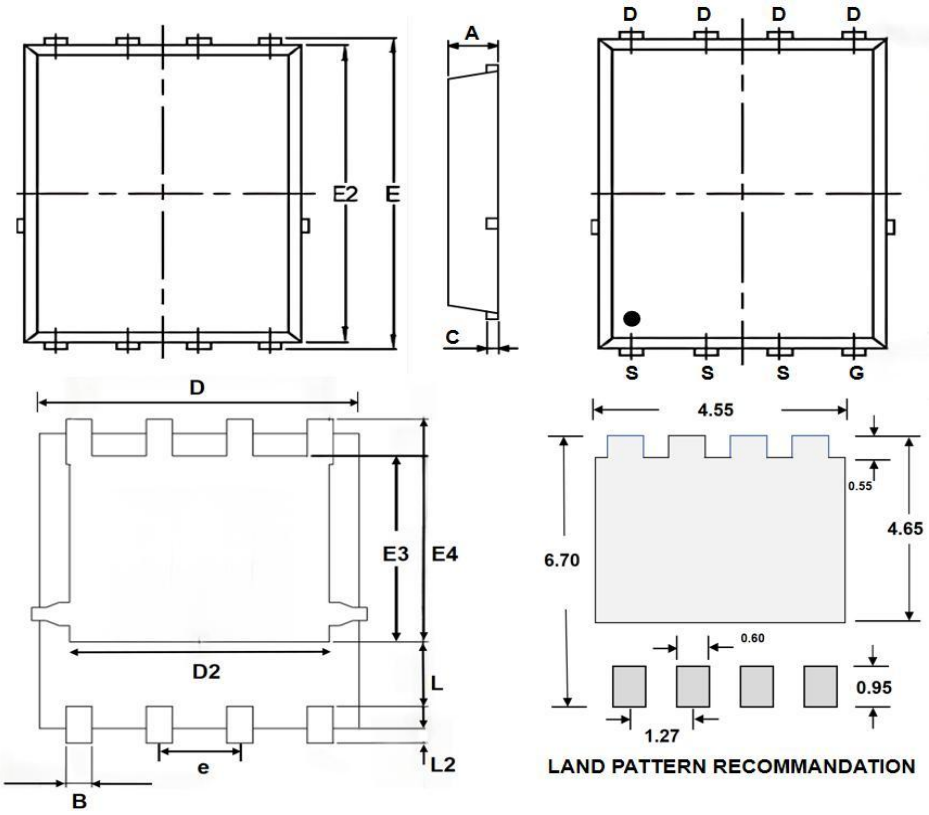
Figure 15: Maximum Safe Operating Area

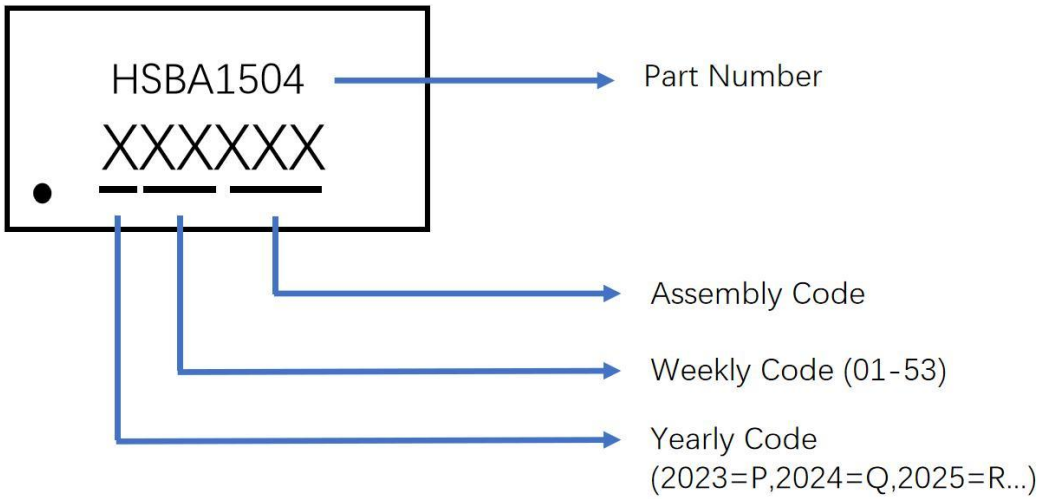


Ordering Information

Part Number	Package code	Packaging
HSBA1504	PRPAK5*6	3000/Tape&Reel

PRPAK5*6 Package Outline



SYMBOLS	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	--	1.20	0.031	--	0.047
B	0.25	--	0.51	0.012	--	0.020
C	0.15	--	0.35	0.006	--	0.014
D	4.80	--	5.45	0.189	--	0.209
D2	3.61	--	4.35	0.142	--	0.171
E	5.90	--	6.35	0.232	--	0.250
E2	5.42	--	6.06	0.213	--	0.232
E3	3.23	--	3.90	0.127	--	0.154
E4	3.69	--	4.55	0.145	--	0.179
L	0.61	--	1.80	0.024	--	0.071
L2	0.05	--	0.36	0.002	--	0.014
e	--	1.27	--	--	0.050	--

HSBA1504 Marking: