WANSEMI
万芯半导体

WP3025DPA

Enhancement Mode N+P-Channel Power MOSFET

PDFN5x6/N+PMOS/30V/±20V/1.85V/25A/7.9mΩ

-30V/±20V/-1.5V/-19A/13.3mΩ

Rev1.0

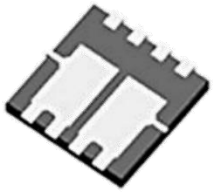
30V N+P-Channel MOSFET

1.Features

- High power and current handing capability
- Lead free product is acquired
- Fast switching
- Surface mount package
- 100% RG Tested
- 100% UIS Tested

2.Applications

- DC motor
- PWM applications



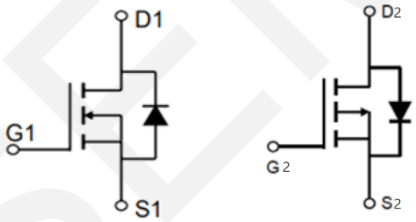
PDFN5x6
Pin Description

- N-Channel

V_{DS}	$R_{DS(on)}$ Typ.	I_D
30V	7.9mΩ @ 10V	25A
	12.1mΩ @ 4.5V	

- P-Channel

V_{DS}	$R_{DS(on)}$ Typ.	I_D
-30V	13.3mΩ @ -10V	-19A
	17.3mΩ @ -4.5V	



N-Channel P-Channel

Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Tube	PCS/CTN.
WP3025DPA	WP3025DPA	PDFN5X6	5,000	50,000

4.Absolute Max Ratings at Ta=25℃ (Note1)

Parameter	Symbol	N-chanel	P-chanel	Units
Drain to Source Voltage	V_{DSS}	30	-30	V
Gate to Source Voltage	V_{GSS}	±20	±20	V
Drain Current (DC)	I_D	25	-19	A
Drain Current (Pulse), PW≤300μs	I_{DM}	90	-60	A
Total Dissipation	P_D	21		W
Junction Temperature	T_j	-55 to +175		℃
Storage Temperature	T_{stg}			

Note 1: Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

5.Thermal Resistance Ratings (Note 2)

Parameter	Symbol	N-chanel	P-chanel	Unit
Maximum Junction-to-Ambient	$R_{\theta JA}$	7	7	℃/W

Note 2: When mounted on 1 inch square copper board t ≤ 10sec The value in any given application depends on the user's specific board design.

6.Electrical Characteristics at Ta=25℃ (Note 3)

N-Channel

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250μA, V_{GS} = 0V	30	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V	-	-	1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=250μA	1.2	1.85	2.2	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D = 7A, V_{GS} = 10V	-	7.9	10	mΩ
		I_D = 6A, V_{GS} = 4.5V	-	12.1	16	mΩ
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	1002	-	pF
Output Capacitance	C_{oss}		-	131	-	pF
Reverse Transfer Capacitance	C_{rss}		-	105	-	pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} =15V V_{GS} = 10V R_G = 3Ω R_L = 2.5Ω	-	5	-	ns
Rise Time	t_r		-	12	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	19	-	ns
Fall Time	t_f		-	6	-	ns
Total Gate Charge	Q_g	V_{DS} = 15V, V_{GS} = 10V, I_D = 6A	-	9.5	-	nC
	Q_{gs}		-	2	-	nC
	Q_{gd}		-	1.9	-	nC
Diode Forward Voltage	V_{FSD}	I_S =7A, V_{GS} = 0V	-	-	1.2	V

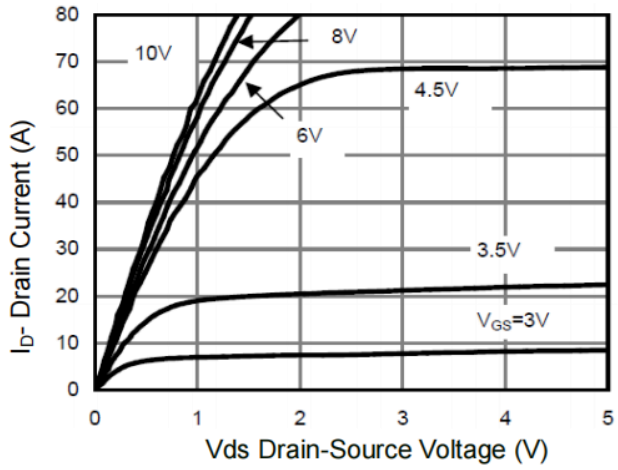
P-Channel

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = -250μA, V_{GS} = 0V	-30	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} = -30V, V_{GS} = 0V	-	-	-1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-1.0	-1.5	-2.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D = -6A, V_{GS} = -10V	-	13.3	17	mΩ
		I_D =-5A, V_{GS} =-4.5V	-	17.3	22.5	mΩ
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V, Frequency=1.0MHz	-	1267	-	pF
Output Capacitance	C_{oss}		-	166	-	pF
Reverse Transfer Capacitance	C_{rss}		-	126	-	pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} = -15V, V_{GS} = -10V, R_{GEN} =3Ω, R_L=1.5Ω,	-	8	-	ns
Rise Time	t_r		-	30	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	22	-	ns
Fall Time	t_f		-	26	-	ns
Total Gate Charge	Q_g	V_{DS} = -15V, V_{GS} = -10V, I_D = -6A	-	16.2	-	nC
	Q_{gs}		-	2.9	-	nC
	Q_{gd}		-	3.6	-	nC
Diode Forward Voltage	V_{FSD}	I_S = -6A, V_{GS} = 0V	-	-	-1.2	V

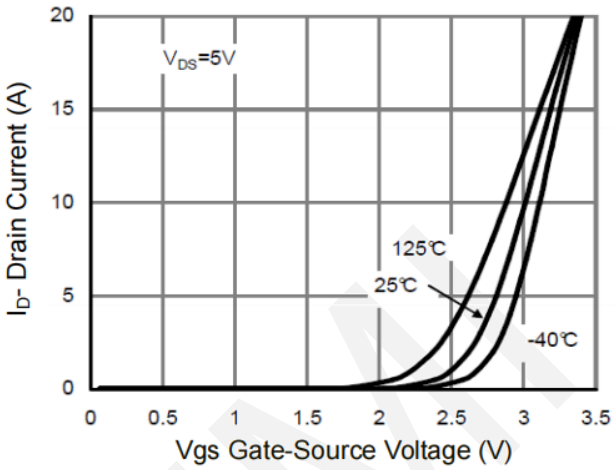
Note 3: Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

7.Typical electrical and thermal characteristics

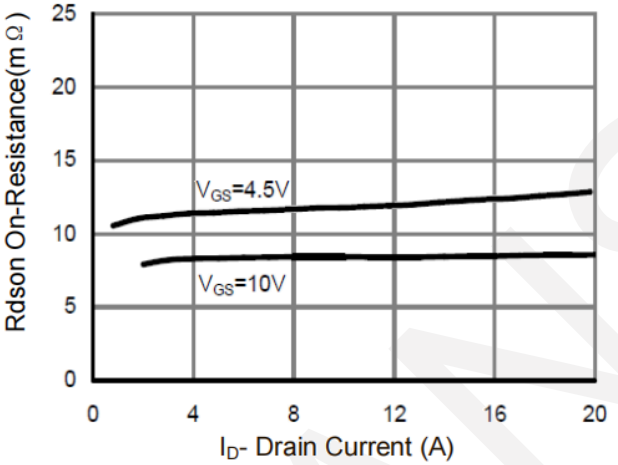
N-Channel



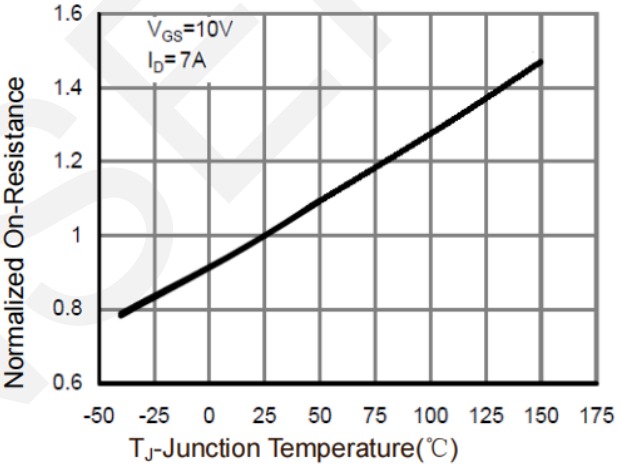
Output Characteristics



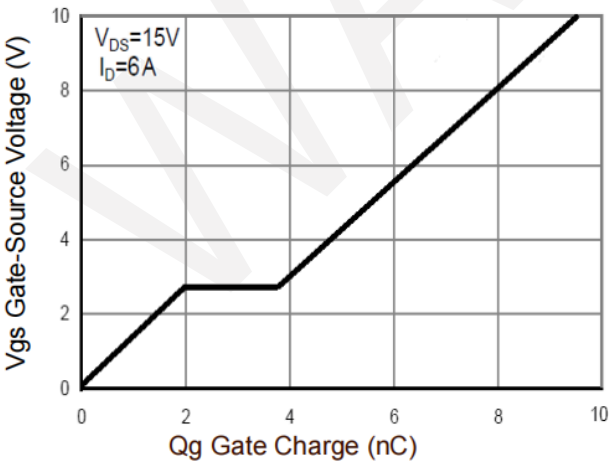
Transfer Characteristics



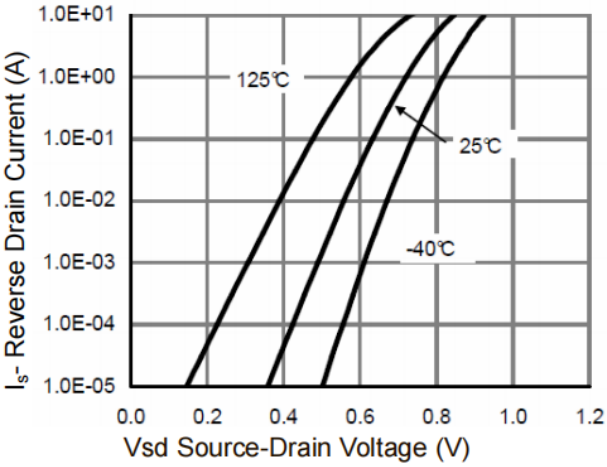
Rdson- Drain Current



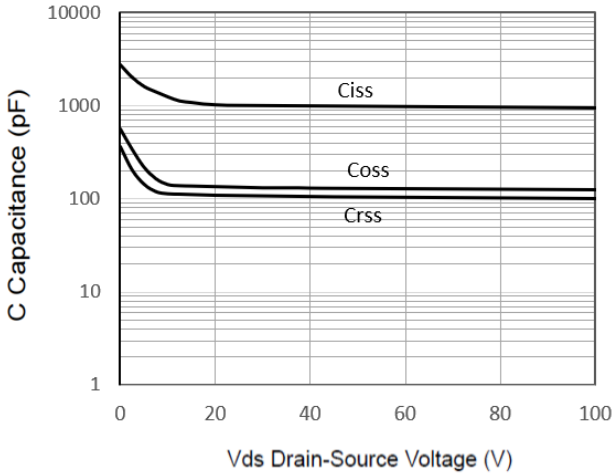
Rdson-Junction Temperature



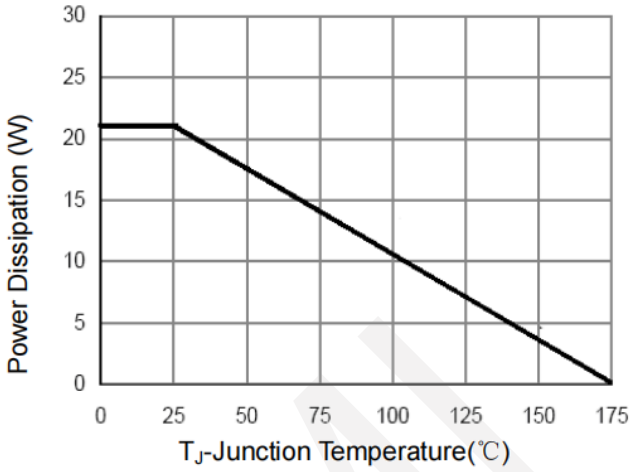
Gate Charge



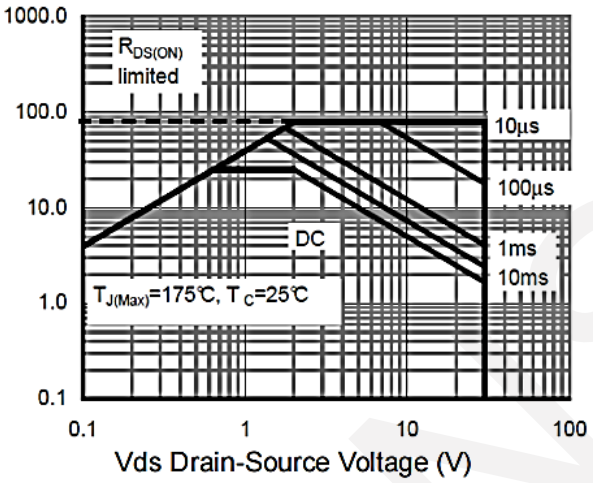
Source- Drain Diode Forward



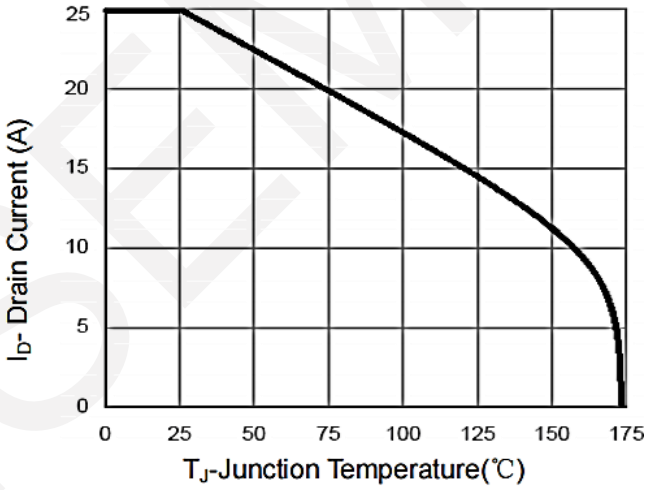
Capacitance vs Vds



Power De-rating

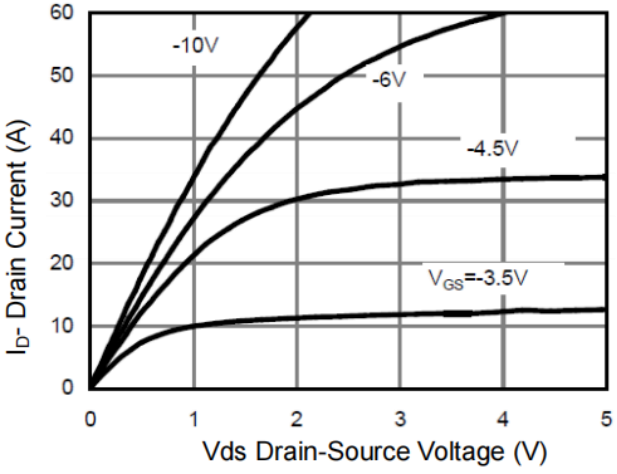


Safe Operation Area

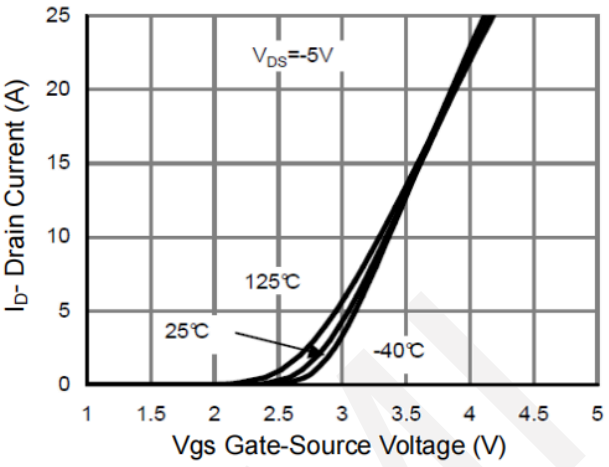


Current De-rating

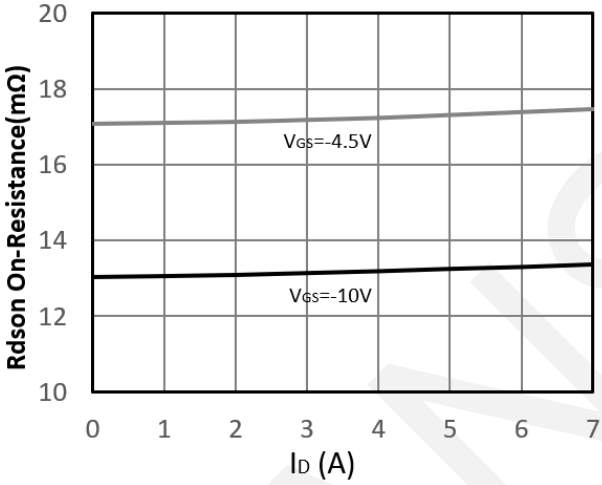
P-Channel



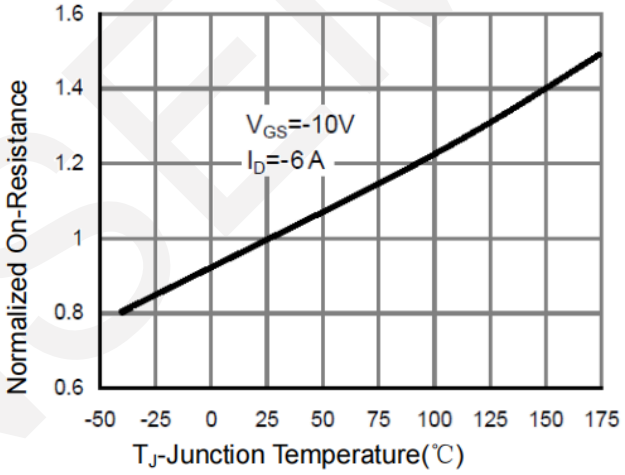
Output Characteristics



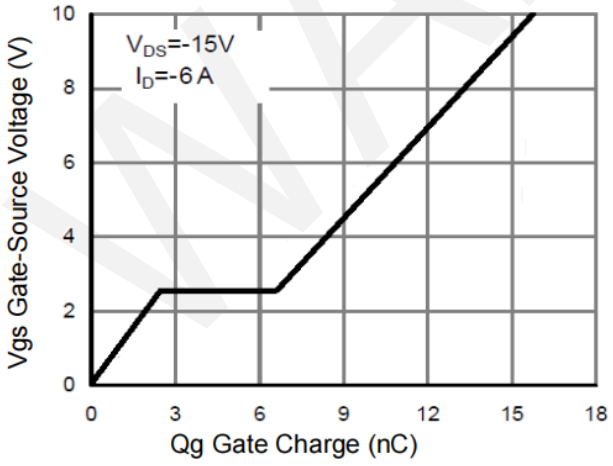
Transfer Characteristics



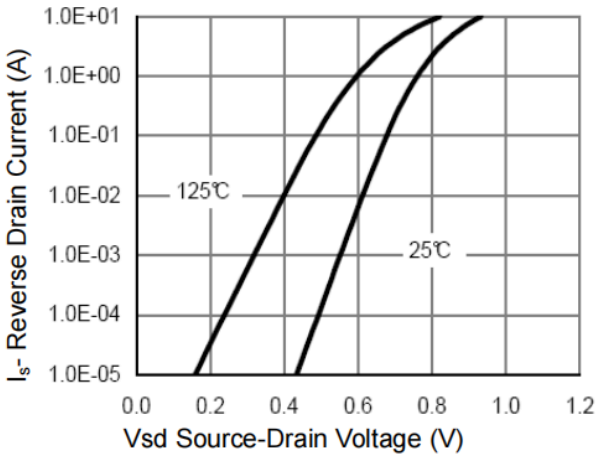
Rdson- Drain Current



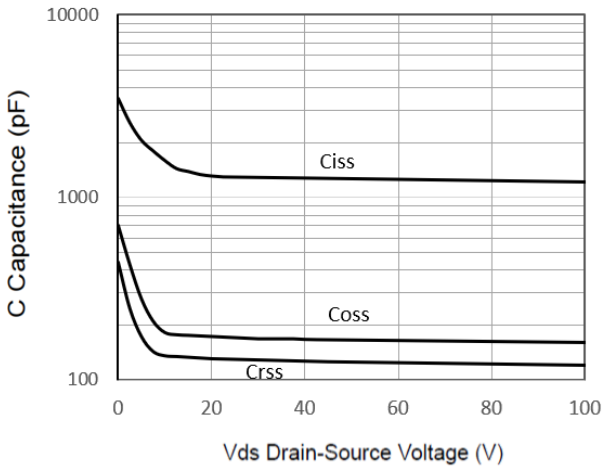
Rdson-Junction Temperature



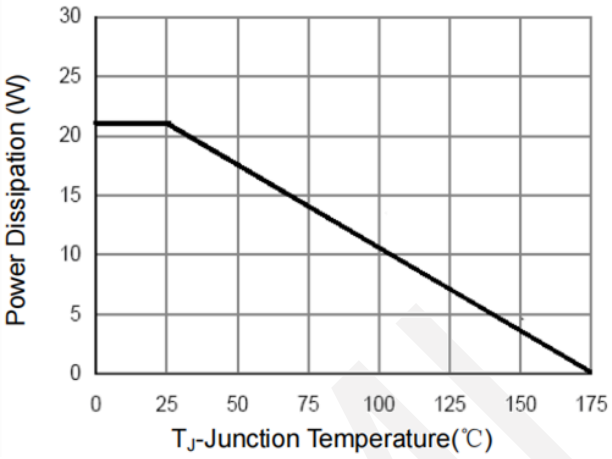
Gate Charge



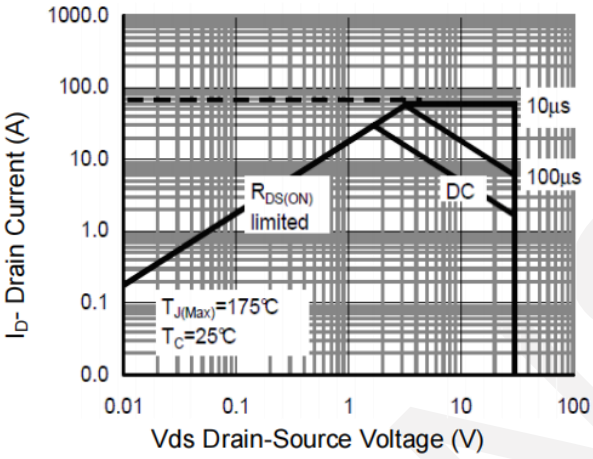
Source- Drain Diode Forward



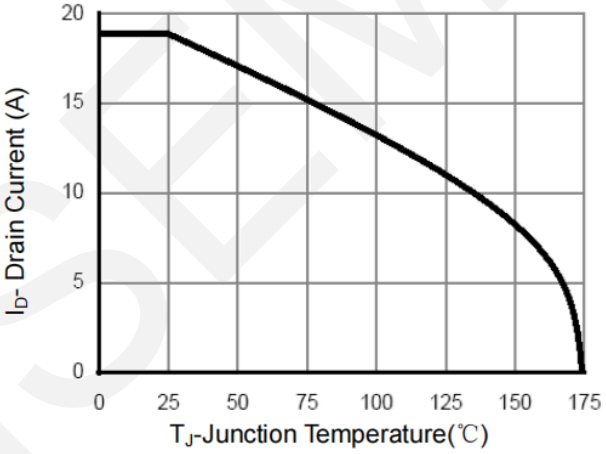
Capacitance vs Vds



Power De-rating

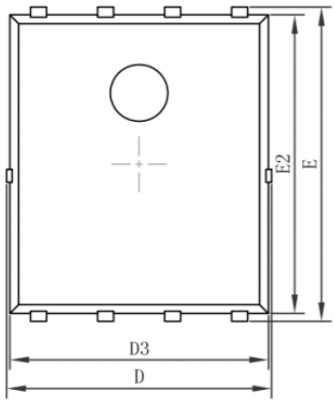


Safe Operation Area

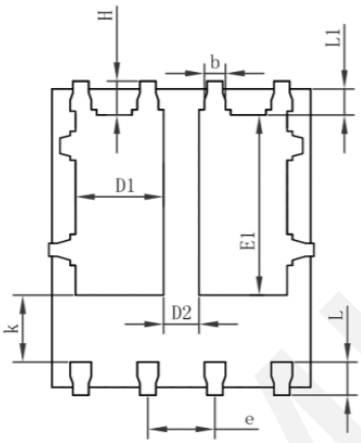


Current De-rating

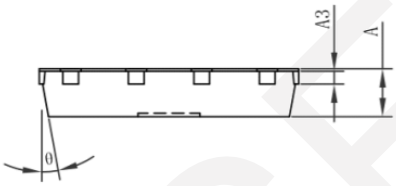
8.Package Dimensions



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A3	0.154REF.		0.006REF.	
D	4.944	5.096	0.195	0.201
E	5.974	6.126	0.235	0.241
D1	1.470	1.870	0.058	0.074
D2	0.470	0.870	0.019	0.034
E1	3.375	3.575	0.133	0.141
D3	4.824	4.976	0.190	0.196
E2	5.674	5.826	0.223	0.229
k	1.190	1.390	0.047	0.055
b	0.350	0.450	0.014	0.018
e	1.270TYP.		0.050TYP.	
L	0.559	0.711	0.022	0.028
L1	0.424	0.576	0.017	0.023
H	0.574	0.726	0.023	0.029
θ	10°	12°	10°	12°

9. Important Notice

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