



WANSEMI
万芯半导体

WP3025

Enhancement Mode N+P-Channel Power MOSFET

TO-252-4L/N+P/30V.-30V/±20V/1.8V.-1.5V/25A.-19A/

7.8mΩ.13.5mΩ

Rev0.6

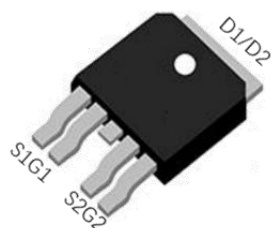
30V N+P-Channel MOSFET

1.Features

- ◆ High power and current handing capability
- ◆ Lead free product is acquired
- ◆ Fast switching
- ◆ Surface mount package

2.Applications

- ◆ DC motor
- ◆ PWM applications



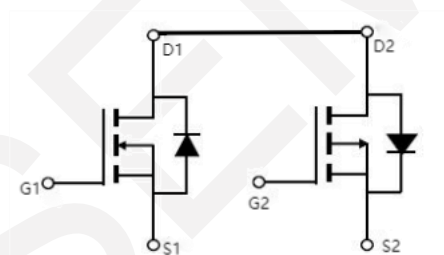
TO-252-4L
Pin Description

◆ N-Channel

V_{DS}	$R_{DS(on)}$ Typ.	I_D
30V	7.8mΩ @10V	25A
	11.9mΩ @ 4.5V	

◆ P-Channel

V_{DS}	$R_{DS(on)}$ Typ.	I_D
-30V	13.5mΩ @ -10V	-19A
	17.5mΩ @ -4.5V	



N-Channel P-Channel
Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP3025	WP3025	TO-252-4L	2,500	25,000

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

Parameter	Symbol	N-channel	P-channel	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), $PW \leq 300\mu s$	I_{DM}	90	-60	A
Total Dissipation	P_D	21		W
Junction Temperature	T_j	-55 to +175		°C
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-channel	P-channel	Unit
Maximum Junction-to-Ambient	$R_{\theta JA}$	7	7	$^{\circ}\text{C/W}$

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

6. Electrical Characteristics at $T_a=25^{\circ}\text{C}$ (Note 3)

N-Channel

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = 250\mu\text{A}$, $V_{GS} = 0\text{V}$	30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{V}$, $V_{GS} = 0\text{V}$			1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20\text{V}$, $V_{DS} = 0\text{V}$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_{DS}=250\mu\text{A}$	1.0	1.8	3.0	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = 7\text{A}$, $V_{GS} = 10\text{V}$		7.8	12	$\text{m}\Omega$
		$I_D = 6\text{A}$, $V_{GS} = 4.5\text{V}$		11.9	18	$\text{m}\Omega$
Input Capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=15\text{V}$, Frequency=1.0MHz		450		pF
Output Capacitance	C_{oss}			150	-	pF
Reverse Transfer Capacitance	C_{rss}			90	-	pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DD} = 15\text{V}$ $V_{GS} = 10\text{V}$ $R_G = 3\Omega$ $R_L = 2.5\Omega$		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	$V_{DS} = 15\text{V}$, $V_{GS} = 10\text{V}$, $I_D = 6\text{A}$		9.5		nC
	Q_{gs}			2		nC
	Q_{gd}			1.9		nC
Diode Forward Voltage	V_{FSD}	$I_S = 25\text{A}$, $V_{GS} = 0\text{V}$			1.2	V

P-Channel

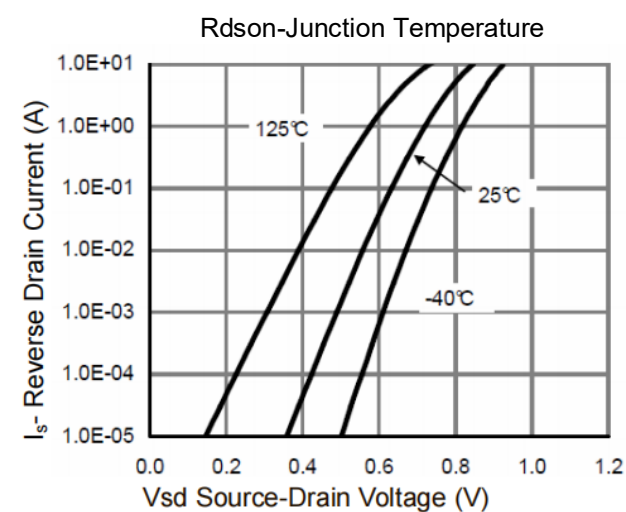
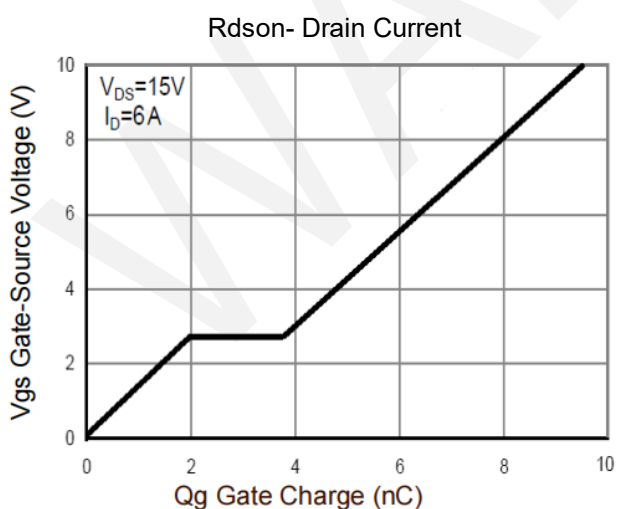
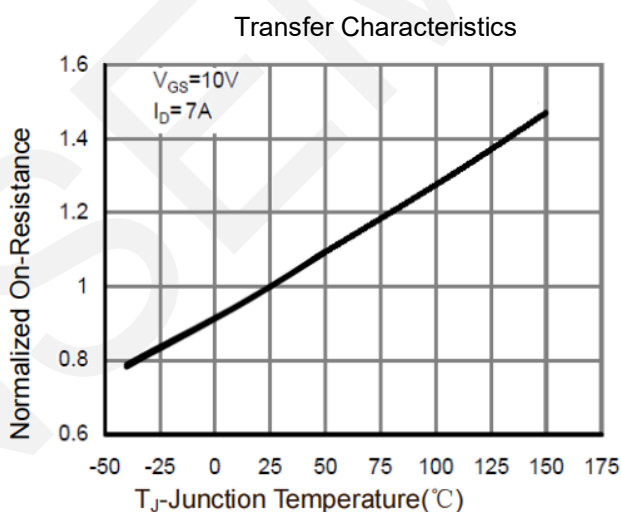
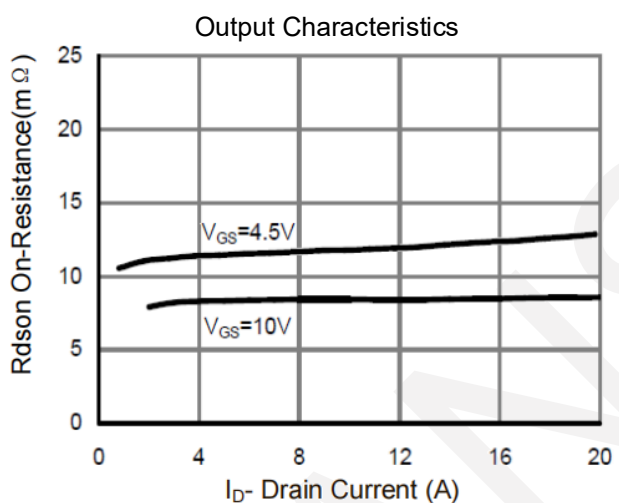
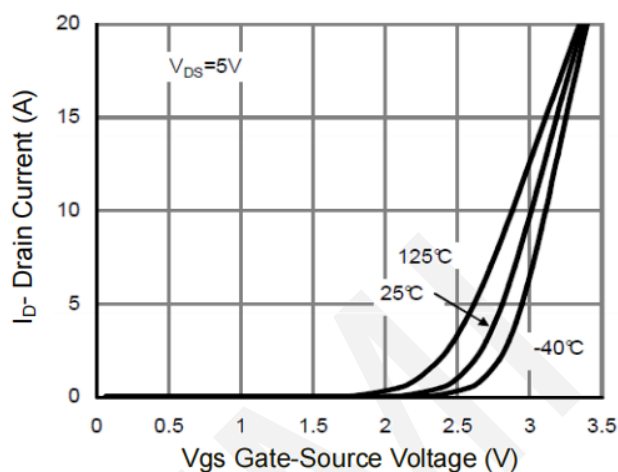
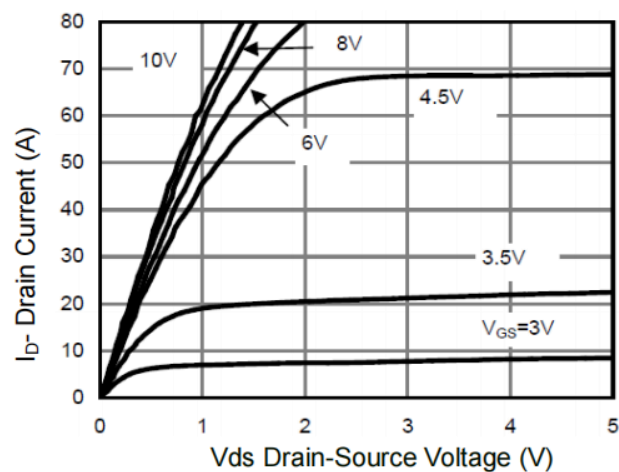
Note 3: Product parametric performance is indicated in the Electrical Characteristics for the listed test

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D = -250\mu A, V_{GS} = 0V$	-30			V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
Gate to Source Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_{DS}=-250\mu A$	-1.0	-1.5	-2.5	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	$I_D = -6A, V_{GS} = -10V$		13.5	20	m Ω
		$I_D = -5A, V_{GS} = -4.5V$		17.5	25	m Ω
Input Capacitance	C_{iss}	$V_{GS}=0V,$ $V_{DS}=-30V,$ Frequency=1.0MHz		920	-	pF
Output Capacitance	C_{oss}			140	-	pF
Reverse Transfer Capacitance	C_{rss}			90	-	pF
Turn-ON Delay Time	$t_{d(on)}$	$V_{DD} = -15V$ $V_{GS} = -10V$ $R_{GEN}=3\Omega,$ $R_L=1.5\Omega,$		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

conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

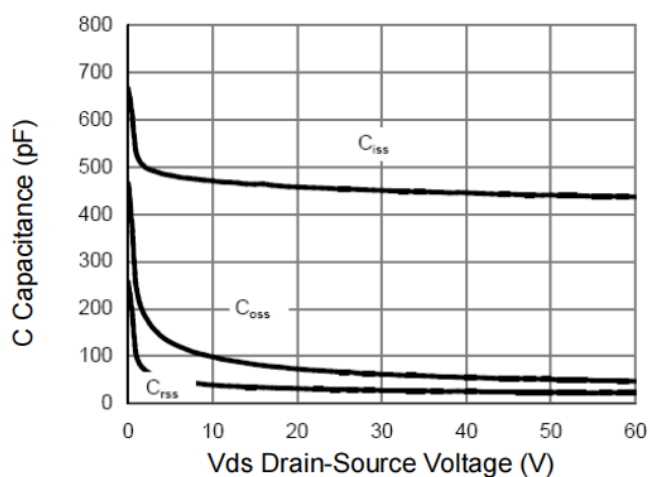
7. Typical electrical and thermal characteristics

N-Channel

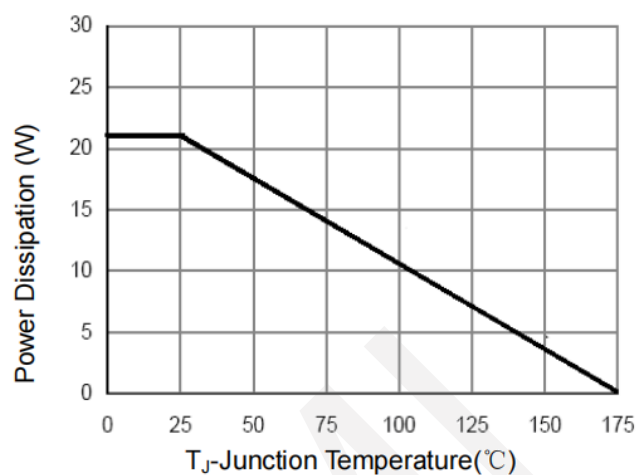


Gate Charge

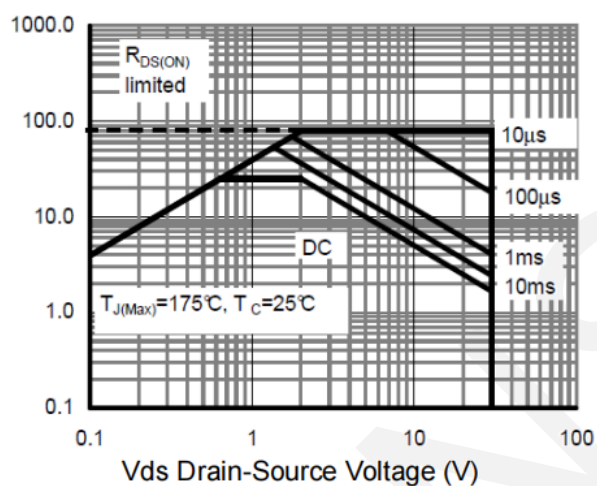
Source- Drain Diode Forward



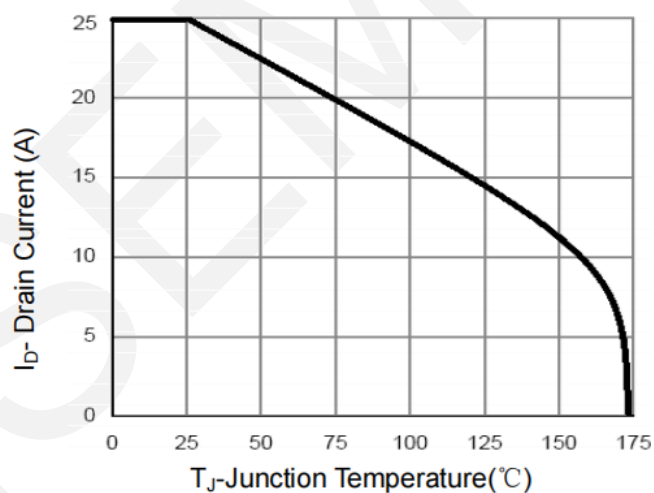
Capacitance vs Vds



Power De-rating



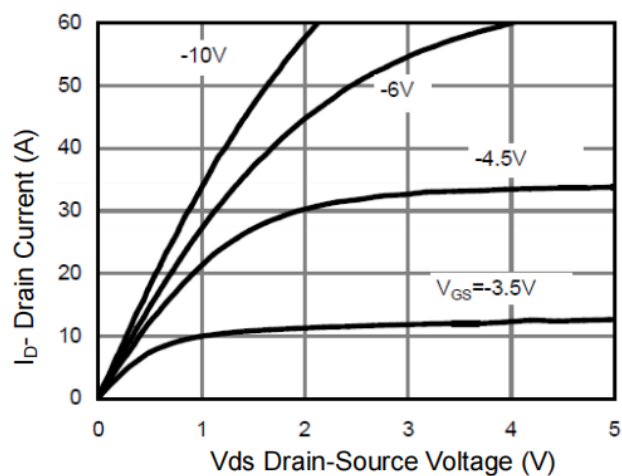
Safe Operation Area



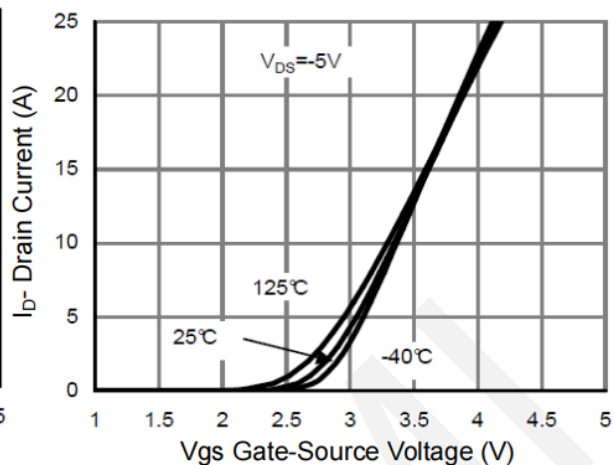
Current De-rating



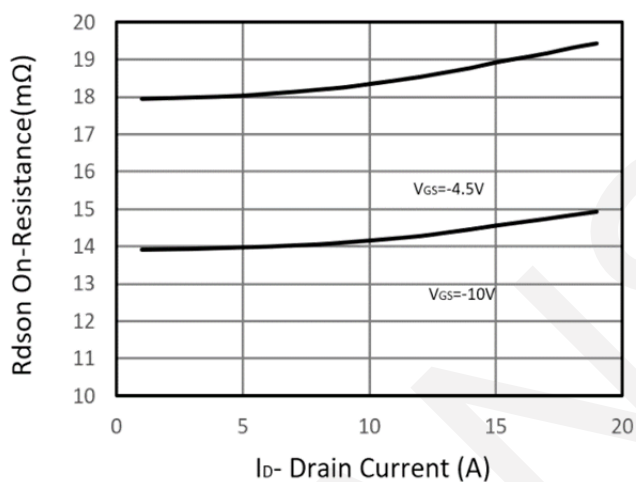
P-Channel



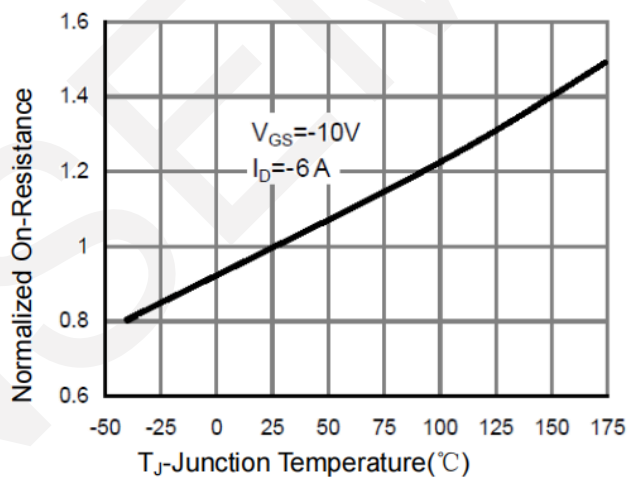
Output Characteristics



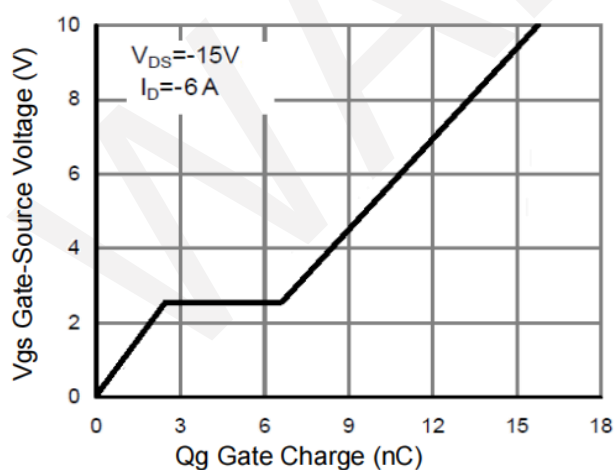
Transfer Characteristics



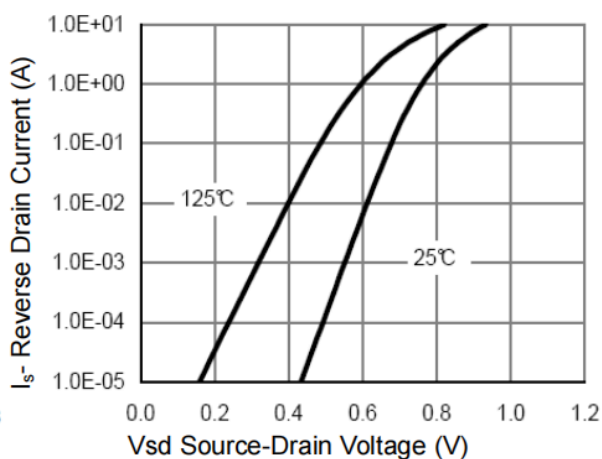
$R_{DS(on)}$ - Drain Current



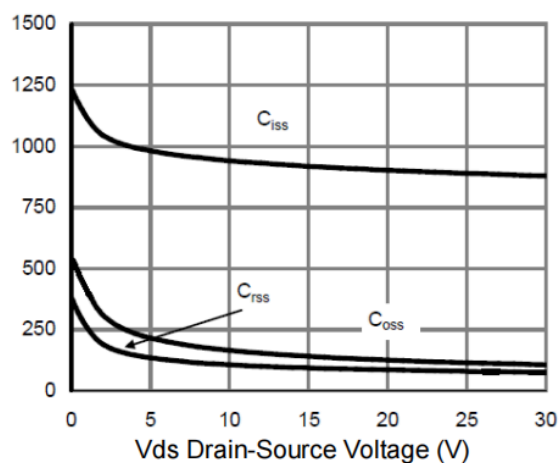
$R_{DS(on)}$ -Junction Temperature



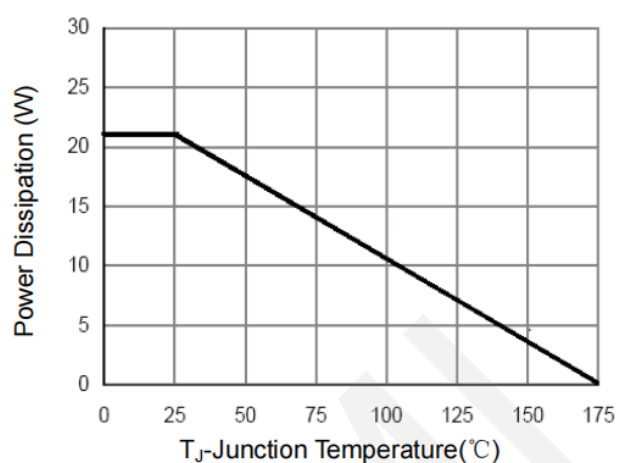
Gate Charge



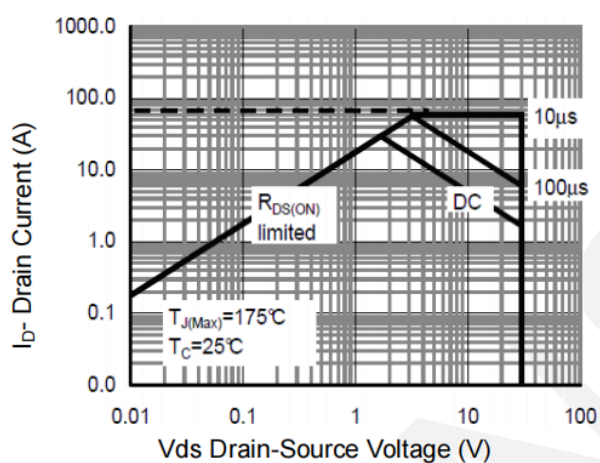
Source- Drain Diode Forward



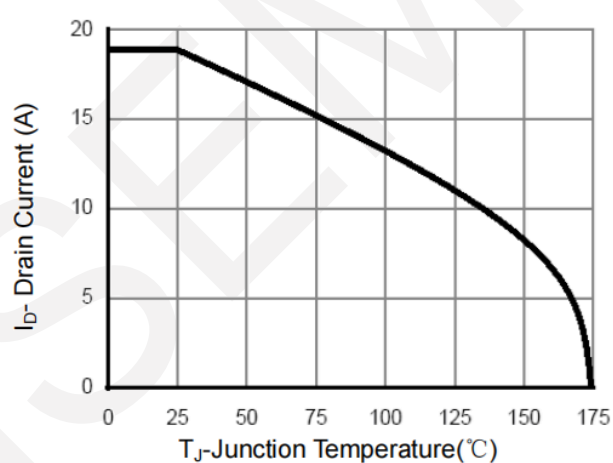
Capacitance vs V_{DS}



Power De-rating

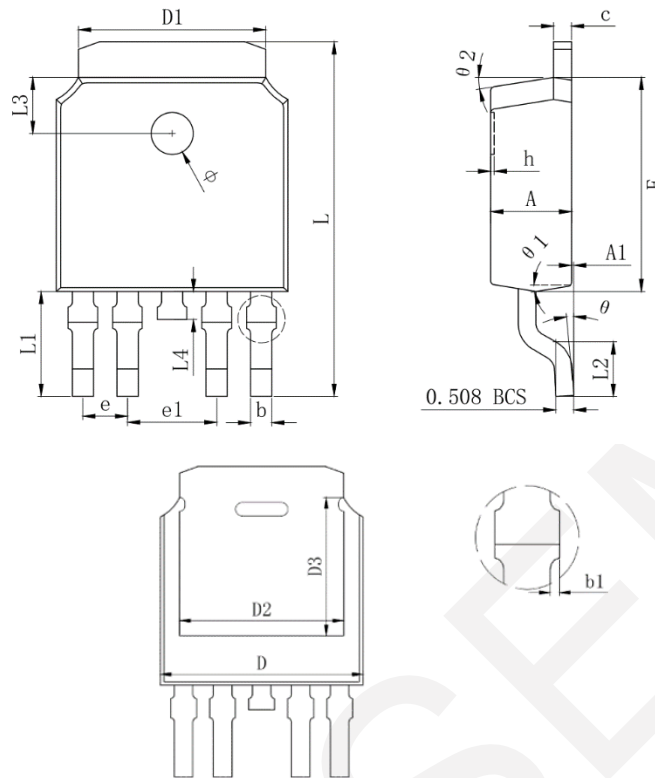


Safe Operation Area



Current De-rating

8.Package Dimensions



SYMBOL	MILLIMETER		
	MIN	Typ.	MAX
A	2.200	2.300	2.400
A1	0.000		0.127
b	0.550	0.600	0.650
b1	0.000		0.120
c(电镀后)	0.460	0.520	0.580
D	6.500	6.600	6.700
D1	5.334 REF		
D2	5.346 REF		
D3	4.490 REF		
E	6.000	6.100	6.200
e	1.270 TYP		
e1	2.540 TYP		
h	0.000	0.100	0.200
L	9.900	10.100	10.300
L1	2.988 REF		
L2	1.400	1.550	1.700
L3	1.600 REF		
L4	0.700	0.800	0.900
Φ	1.100	1.200	1.300
θ	0°		8°
$\theta 1$	9° TYP		
$\theta 2$	9° TYP		

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