WANSEMI
万芯半导体

WP4616

Enhancement Mode N+P-Channel Power MOSFET

SOP8/N+PMOS/30V/±20V/1.7V/9A/15mΩ

-30V/±20V/-1.7V/-9A/25mΩ

Rev0.3

30V N+P-Channel MOSFET

1.Features

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

◆ N-Channel

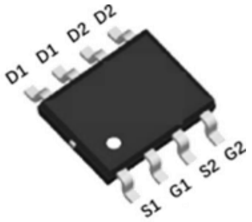
V_{DS}	$R_{DS(on)}$ Typ.	I_D
30V	15mΩ @ 10V	9A
	22mΩ @ 4.5V	

◆ P-Channel

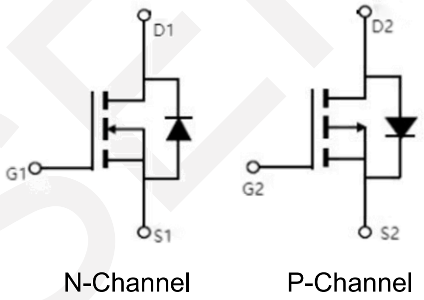
V_{DS}	$R_{DS(on)}$ Typ.	I_D
-30V	25mΩ @ -10V	-9A
	30mΩ @ -4.5V	

2.Applications

- Power Switching Application
- Load Switching
- BLDC Motor driver



SOP8
Pin Description



Schematic Diagram

3.Package Marking and Ordering Information

Part no.	Marking	Package	PCS/Reel	PCS/CTN.
WP4616	4616	SOP8	4,000	48,000

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),	TA=25 °C	I_D	9	-9	A
	TA=70 °C	I_D	5.8	-5	A
Drain Current (Pulse), PW≤300μs		I_{DM}	36	-36	A
Avalanche Energy, Single Pulsed		E_{AS}	24.6	38	mJ
Total Dissipation	TA=25 °C	P_D	10.8	20.8	W
Junction Temperature		T_j	150	150	℃

Parameter	Symbol	N-chanel	P-chanel	Units
Storage Temperature	T_{stg}	-55 to +150	-55 to +150	℃

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)

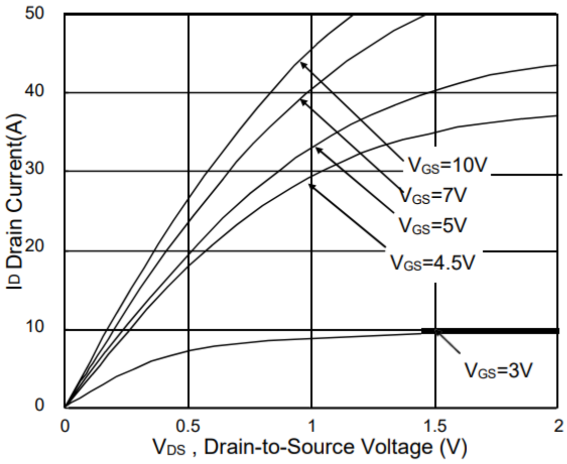
Parameter	Symbol	N-chanel	P-chanel	Unit
Maximum Junction-to-Ambient	$R_{\theta JA}$	57	20	℃/W

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.

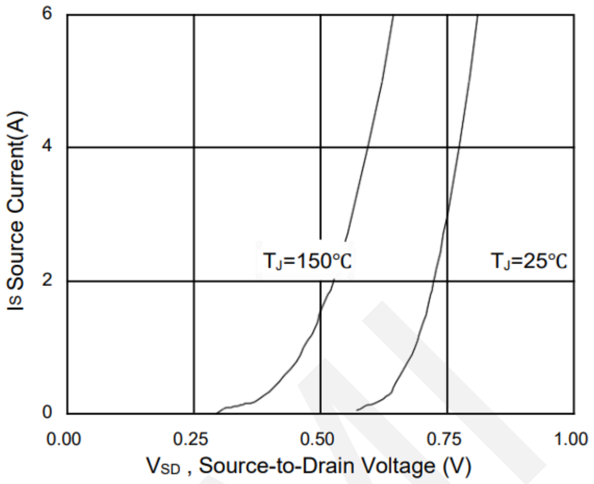
6.NMOS Electrical Characteristics at Ta=25℃ (Note 3)

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	1.7	2.2	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D = 5.5A, V_{GS} = 10V	-	15	21	mΩ
		I_D = 4.5A, V_{GS} = 4.5V	-	22	33	mΩ
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=15V, Frequency=1.0MHz	-	490	-	pF
Output Capacitance	C_{oss}		-	79	-	pF
Reverse Transfer Capacitance	C_{rss}		-	61	-	pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} = 15V, V_{GS} = 10V, R_{REN} = 3Ω, I_D=5.8A	-	6	-	ns
Rise Time	t_r		-	15	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	17	-	ns
Fall Time	t_f		-	17	-	ns
Total Gate Charge	Q_g	V_{DS} = 15V, V_{GS} = 10V, I_D = 5.8A	-	10	-	nC
	Q_{gs}		-	1.7	-	nC
	Q_{gd}		-	2.5	-	nC
Diode Forward Voltage	V_{FSD}	I_S = 5.5A, V_{GS} = 0V	-	-	1.2	V

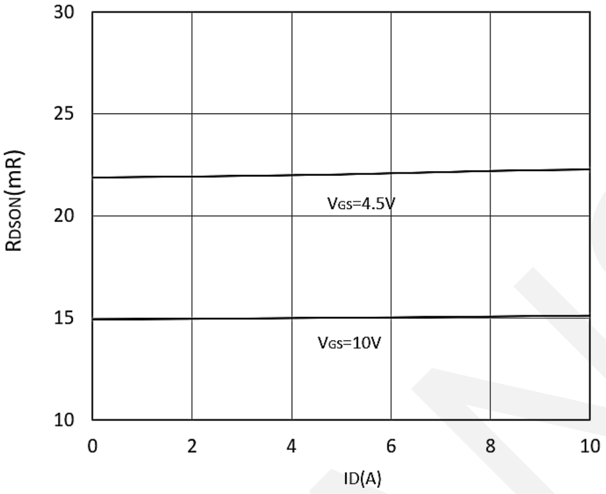
NMOS Typical electrical and thermal characteristics



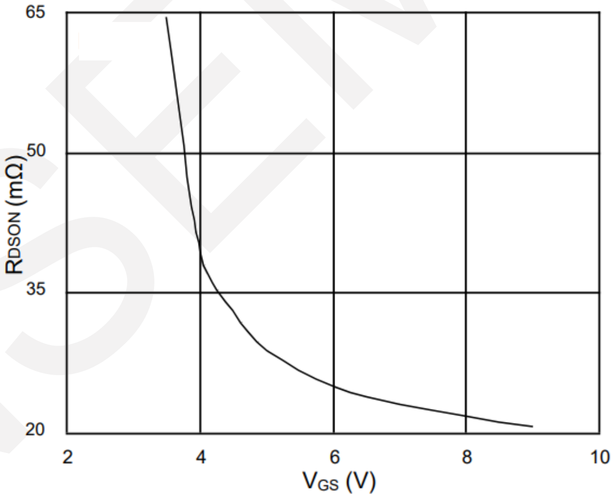
Output Characteristics



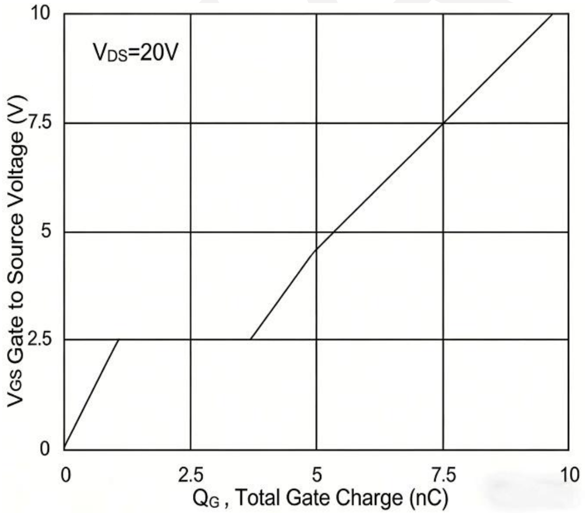
Transfer Characteristics



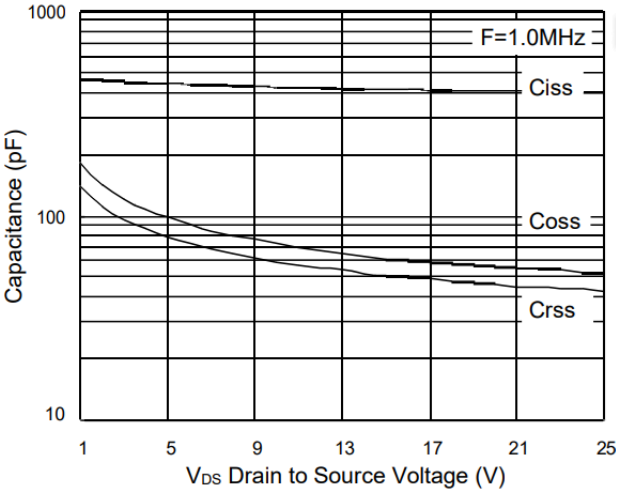
On-resistance vs. Drain Current



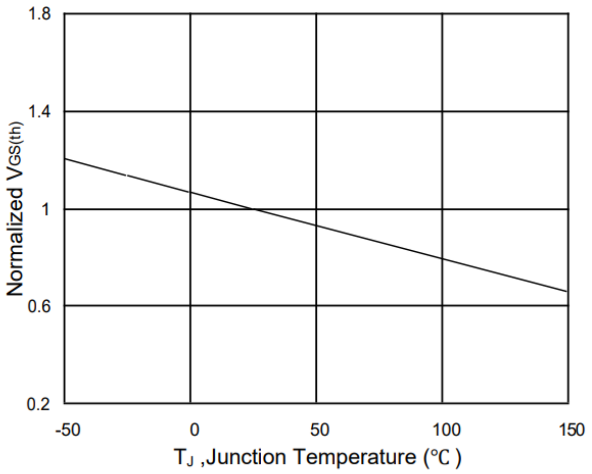
On-Resistance vs. Gate-Source



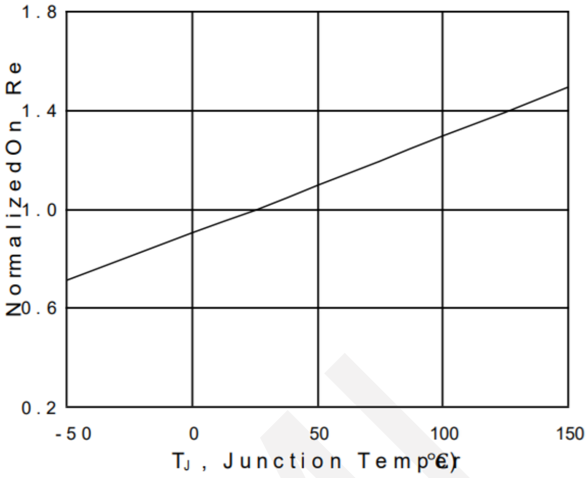
Gate Charge Characteristics



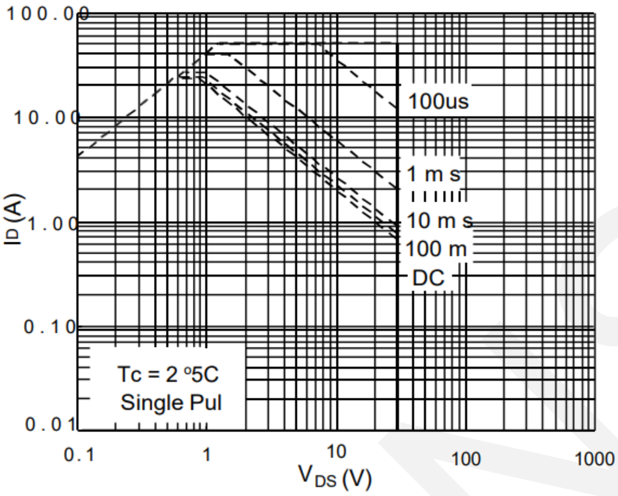
Capacitance Characteristics



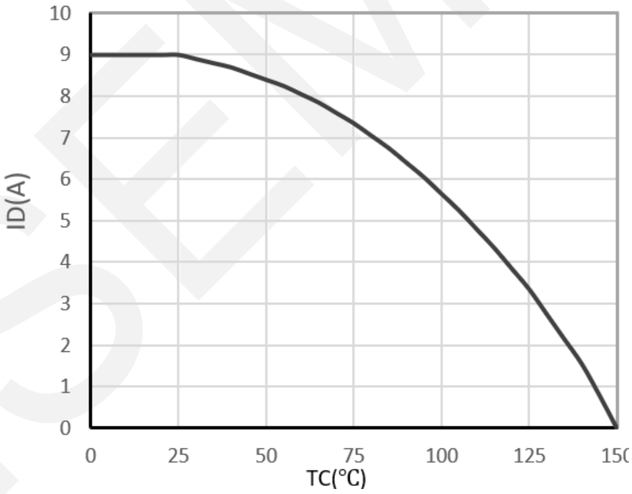
Normalized Breakdown Voltage
vs. Junction Temperature



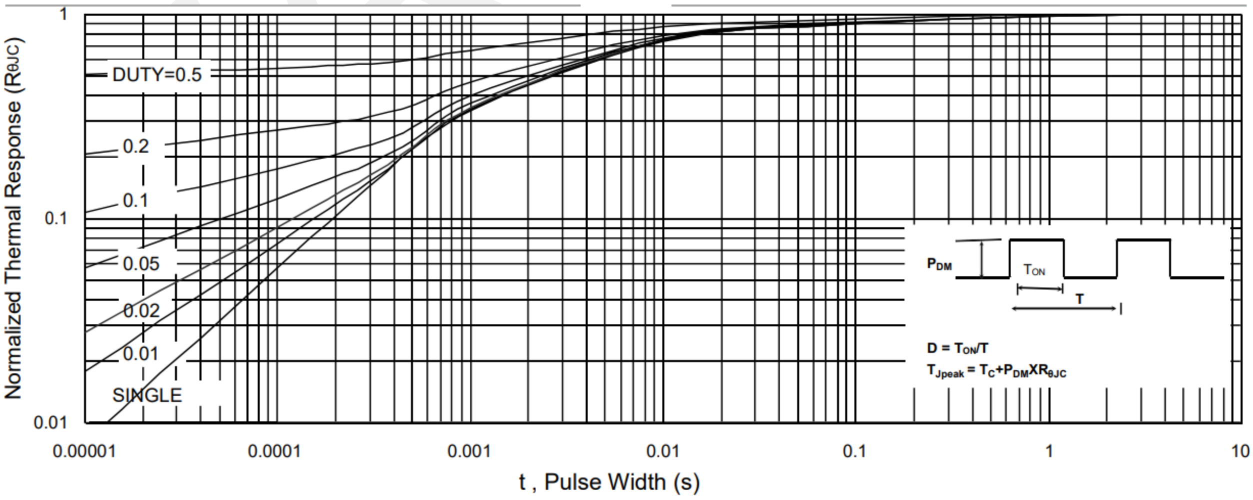
Normalized on Resistance vs.
Junction Temperature



Maximum Safe Operating Area



Maximum Continuous Drain Current vs.
Ambient Temperature



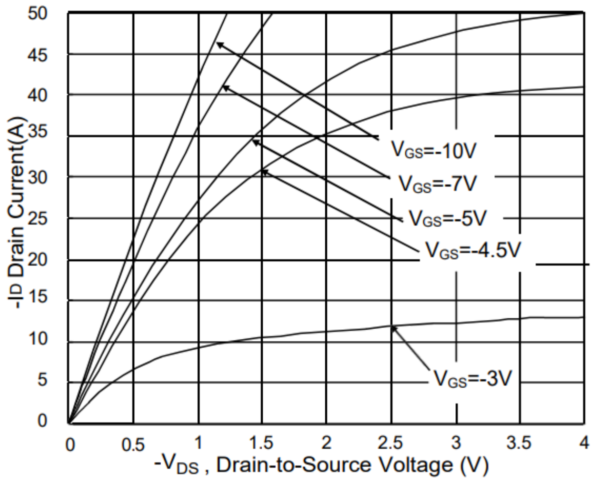
Maximum Effective Transient Thermal
Impedance, Junction-to-Ambient

7.PMOS Electrical Characteristics at Ta=25℃

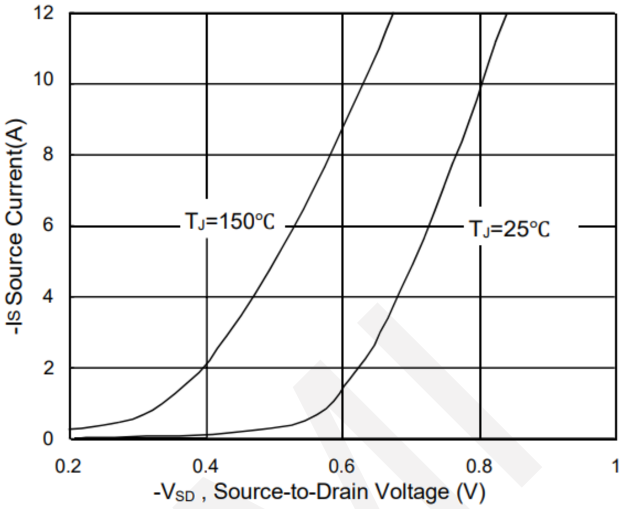
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Units
Drain to Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = -250μA, V_{GS} = 0V	-30	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS} = -30V, V_{GS} = 0V	-	-	-1	μA
Gate to Source Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	-	-	±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_{DS}=-250μA	-1.2	-1.7	-2.3	V
Static Drain to Source On-State Resistance	$R_{DS(on)}$	I_D = -6A, V_{GS} = -10V	-	25	32	mΩ
		I_D = -4A, V_{GS} =-4.5V	-	30	44	mΩ
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V, Frequency=1.0MHz	-	930	-	pF
Output Capacitance	C_{oss}		-	148	-	pF
Reverse Transfer Capacitance	C_{rss}		-	115	-	pF
Turn-ON Delay Time	$t_{d(on)}$	V_{DD} = -24V I_D=-1A V_{GS} = -10V R_{GEN} =3.3Ω	-	16.4	-	ns
Rise Time	t_r		-	20.2	-	ns
Turn-OFF Delay Time	$t_{d(off)}$		-	55	-	ns
Fall Time	t_f		-	10	-	ns
Total Gate Charge	Q_g	V_{DS} = -20V, V_{GS} = -4.5V, I_D = -6A	-	9.8	-	nC
	Q_{gs}		-	2.2	-	nC
	Q_{gd}		-	3.4	-	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 condit

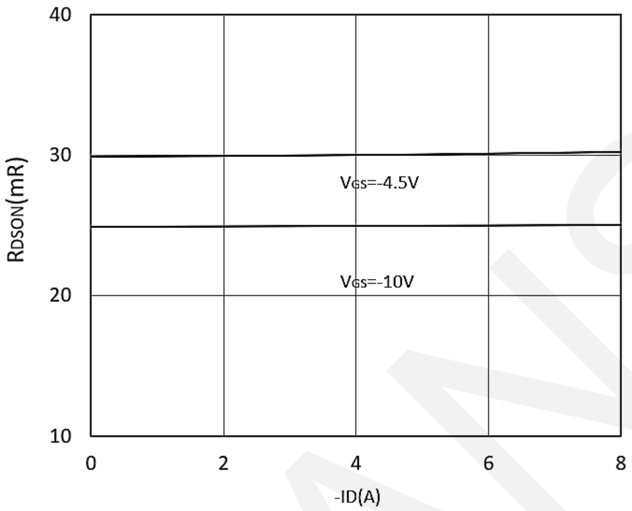
PMOS Typical electrical and thermal characteristics



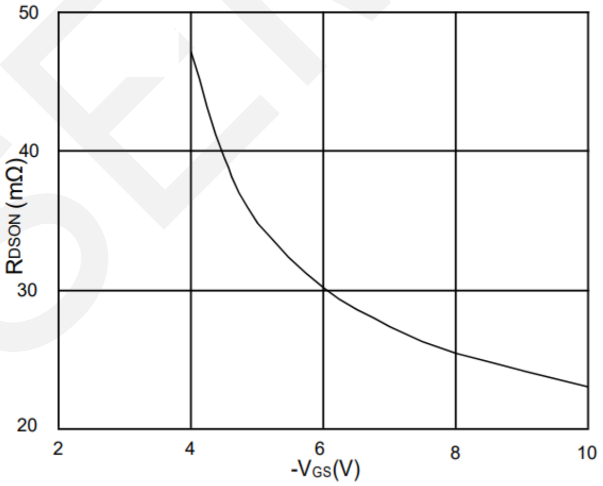
Output Characteristics



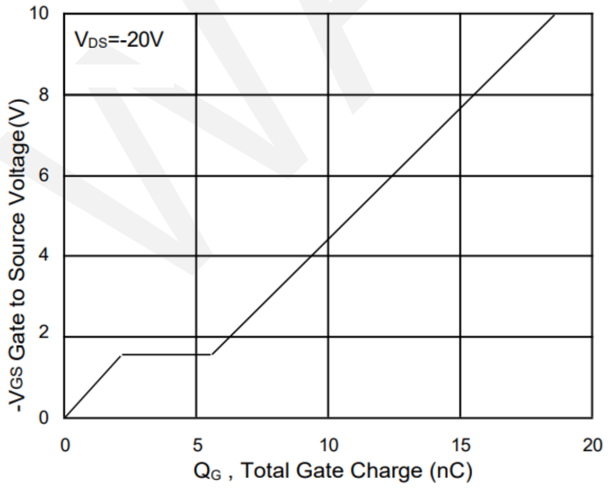
Transfer Characteristics



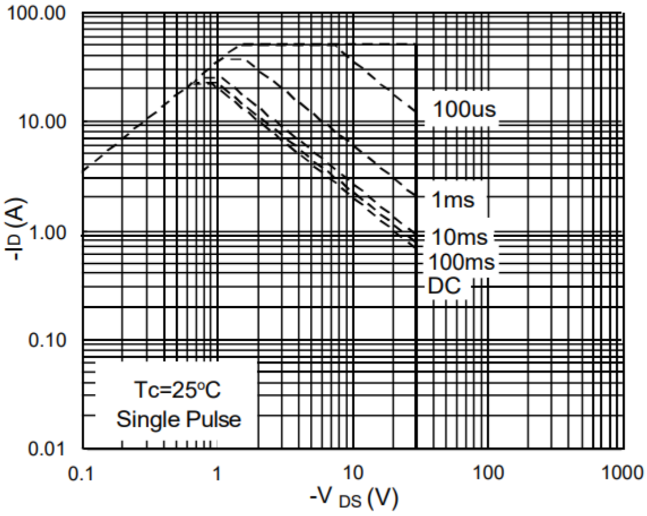
On-resistance vs. Drain Current



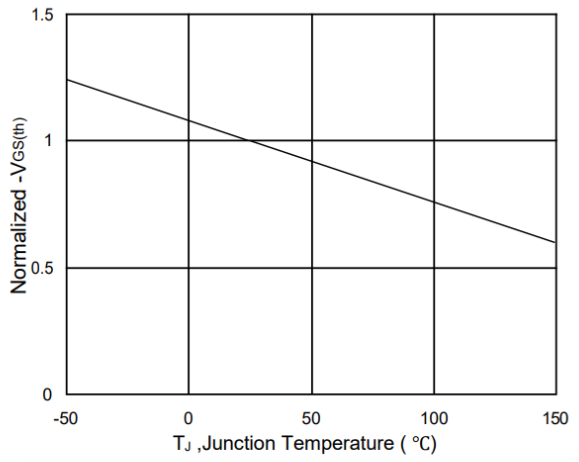
On-Resistance vs. Gate-Source



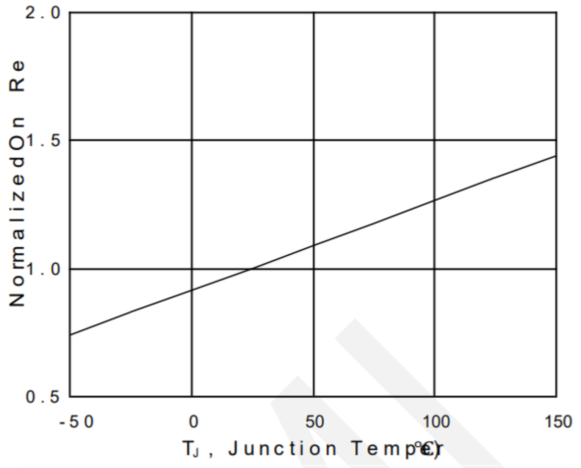
Gate Charge Characteristics



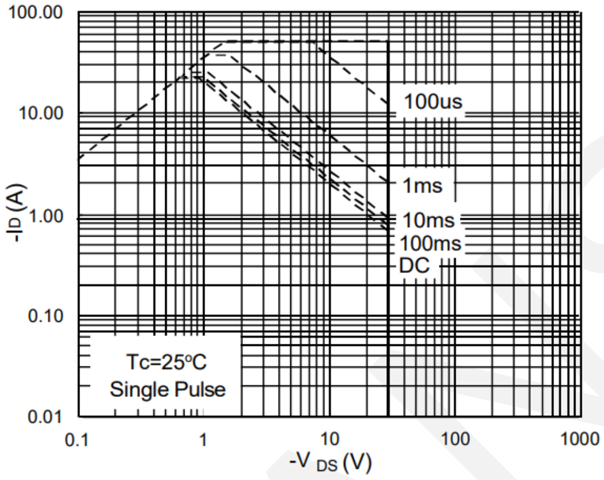
Capacitance Characteristics



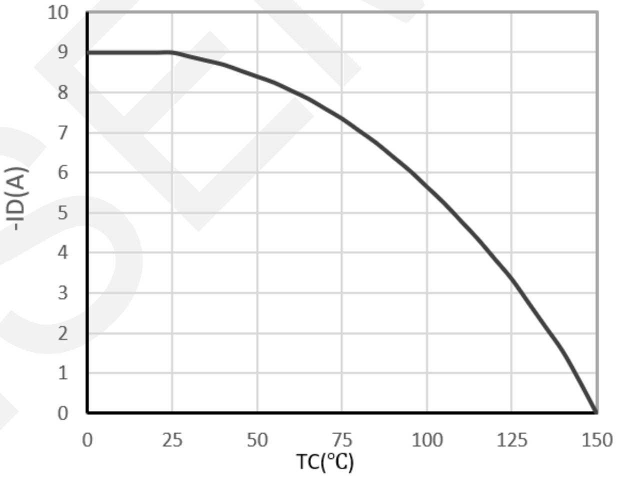
Normalized Breakdown Voltage vs. Junction Temperature



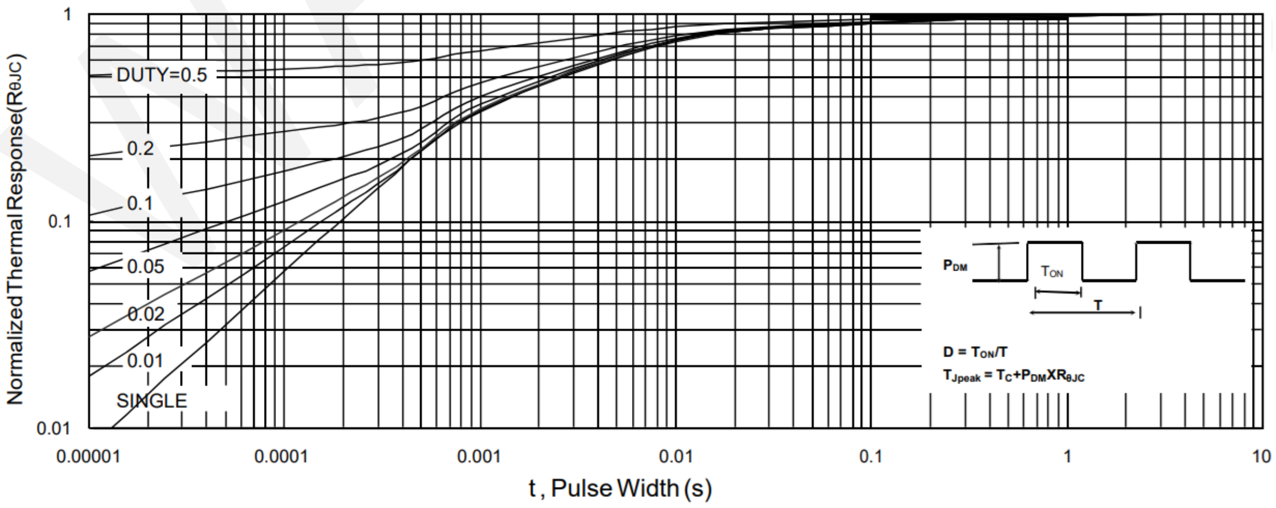
Normalized on Resistance vs. Junction Temperature



Maximum Safe Operating Area

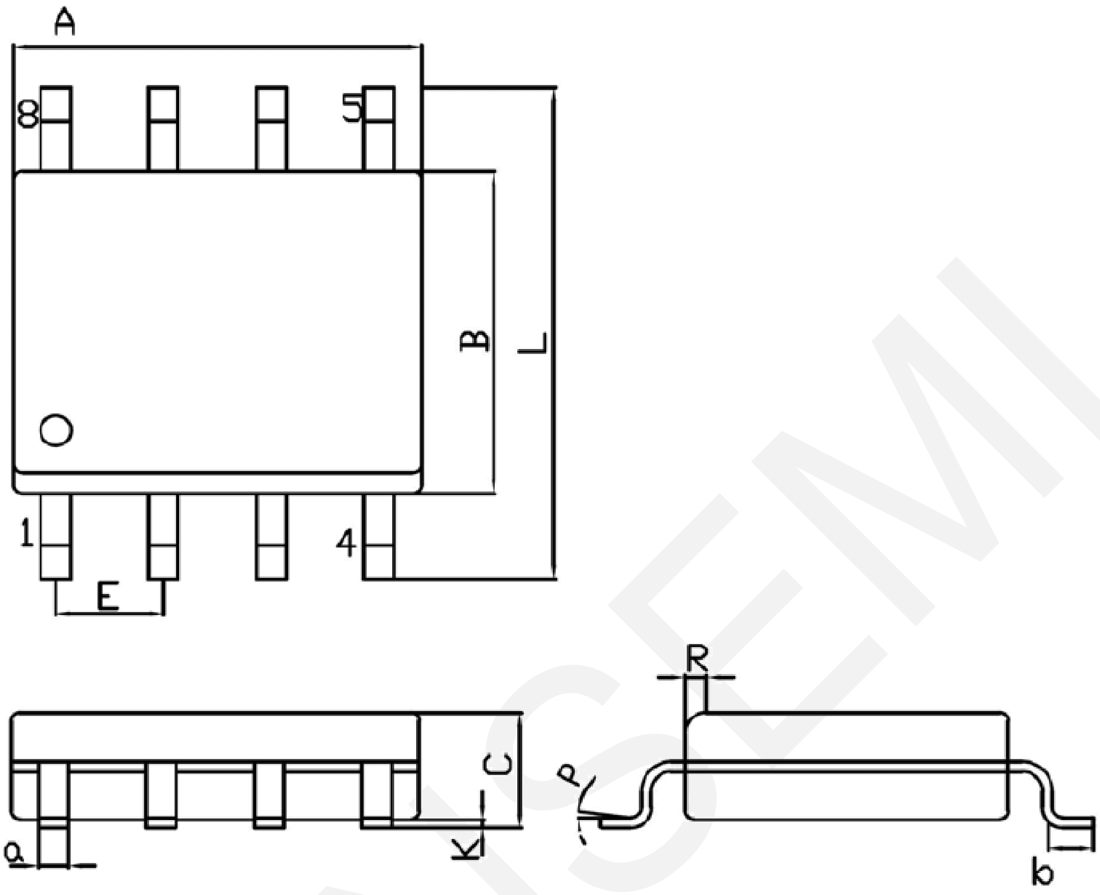


Maximum Continuous Drain Current vs. Ambient Temperature



Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

8.Package Dimensions



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
A	4.70	5.10	C	1.35	1.75
B	3.70	4.10	a	0.35	0.49
L	5.80	6.20	R	0.30	0.60
E	1.27BSC		P	0°	7°
K	0.12	0.22	b	0.40	1.25

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