

PRODUCT CHARACTERISTICS

N-CHANNEL		P-CHANNEL	
V_{DSS}	30V	V_{DSS}	-30V
$R_{DS(ON)} Typ(@V_{GS}=10V)$	16m Ω	$R_{DS(ON)} Typ(@V_{GS}=-10V)$	25m Ω
$R_{DS(ON)} Typ(@V_{GS}=4.5V)$	22m Ω	$R_{DS(ON)} Typ(@V_{GS}=-4.5V)$	34m Ω
I_D	12A	I_D	-12A

APPLICATIONS

- * High efficiency switch mode power supplies
- * Electronic lamp ballasts based on half bridge
- * LED power supplies

FEATURE

- * High Switching Speed
- * Improved dv/dt capability

ORDER INFORMATION

Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT3029G	PDFN5X6	5000 pieces/Reel

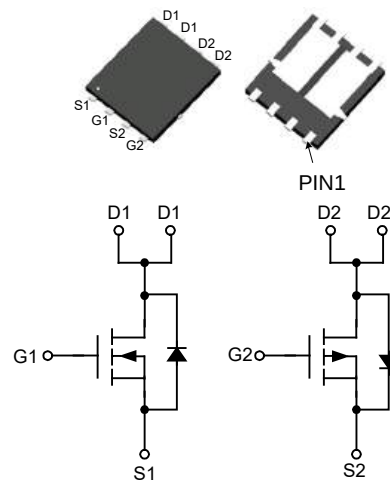
ABSOLUTE MAXIMUM RATINGS($T_A=25^{\circ}C$, unless otherwise specified)

Parameter	Symbol	N-CHANNEL	P-CHANNEL	Unit
Drain-Source Voltage	V_{DSS}	30	-30	V
Gate-Source Voltage	V_{GSS}	± 20	± 20	V
Drain Current Continuous($@V_{GS}=\pm 10V, T_A=25^{\circ}C$)	I_D	12	-12	A
Drain Current Pulsed	I_{DM}	48	-48	A
Power Dissipation	P_D	15		W
Junction Temperature	T_J	+150		$^{\circ}C$
Storage Temperature	T_{STG}	-55~ +150		$^{\circ}C$

THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R_{thJC}	8.3	$^{\circ}C/W$

Symbol



PDFN5X6



■ N-CHANNEL ELECTRICAL CHARACTERISTICS($T_c=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V _{DSS}	V _{GS} =0V, I _D =-250μA	30	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	-1	μA
Gate to Source Forward Leakage	I _{GSS(F)}	V _{GS} =+20V, V _{DS} =0V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS(R)}	V _{GS} =-20V ,V _{DS} =0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =10 A	-	16	25	mΩ
		V _{GS} =4.5V, I _D =5 A	-	22	32	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1	1.5	2.5	V
Dynamic characteristics						
Gate resistance	R _g	V _{GS} =0V, V _{DS} =0V ,f=1.0MHz	-	1.9	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =5V, I _D =5 A	-	10	-	S
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V f=1.0MHz	-	572	-	pF
Output Capacitance	C _{oss}		-	74	-	pF
Reverse Transfer Capacitance	C _{rss}		-	54	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =10V, V _{DS} =15V, I _D =12 A, R _G =3Ω	-	8.9	-	ns
Rise Time	t _r		-	2.2	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	41	-	ns
Fall Time	t _f		-	3	-	ns
Total Gate Charge	Q _g	I _D =12A, V _{DS} =15V V _{GS} =10V	-	5.5	-	nC
Gate to Source Charge	Q _{gs}		-	1.25	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	2.5	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _s		-	-	12	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	48	A
Diode Forward Voltage	V _{SD}	I _{SD} =1A, V _{GS} =0V	-	0.77	1.2	V

■ P-CHANNEL ELECTRICAL CHARACTERISTICS($T_c=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Off characteristics						
Drain to Source Breakdown Voltage	V _{DSS}	V _{GS} =0V,I _D =-250μA	-30	-	-	V
Drain to Source Leakage Current	I _{DSS}	V _{DS} =-30V,V _{GS} =0V	-	-	-1	μA
Gate to Source Forward Leakage	I _{GSS(F)}	V _{GS} =+20V,V _{DS} =0V	-	-	100	nA
Gate to Source Reverse Leakage	I _{GSS(R)}	V _{GS} =-20V ,V _{DS} =0V	-	-	-100	nA
On characteristics						
Drain to Source On-Resistance	R _{DS(ON)}	V _{GS} =-10V,I _D =-10 A	-	25	30	mΩ
		V _{GS} =-4.5V,I _D =-5 A	-	34	40	mΩ
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} ,I _D =-250μA	-1	-1.65	-2.5	V
Dynamic characteristics						
Gate resistance	R _g	V _{GS} =0V,V _{DS} =0V ,f=1.0MHz	-	16.7	-	Ω
Forward Transconductance	g _{fs}	V _{DS} =-10V,I _D =-1A	-	5	-	S
Input Capacitance	C _{iss}	V _{DS} =-15V,V _{GS} =0V f=1.0MHz	-	691	-	pF
Output Capacitance	C _{oss}		-	100	-	pF
Reverse Transfer Capacitance	C _{rss}		-	90	-	pF
Resistive Switching Characteristics						
Turn-on Delay Time	t _{d(ON)}	V _{GS} =-10V,V _{DS} =-15V, I _D =-12 A,R _G =3Ω	-	22	-	ns
Rise Time	t _r		-	13	-	ns
Turn-off Delay Time	t _{d(OFF)}		-	50	-	ns
Fall Time	t _f		-	5.2	-	ns
Total Gate Charge	Q _g	I _D =-12 A, V _{DS} =-15V V _{GS} =-10V	-	11	-	nC
Gate to Source Charge	Q _{gs}		-	2.8	-	nC
Gate to Drain("Miller") Charge	Q _{gd}		-	4	-	nC
Source-Drain Diode Characteristics						
Continuous Source Current(Body Diode)	I _s		-	-	-12	A
Maximum Pulsed Current(Body Diode)	I _{SM}		-	-	-48	A
Diode Forward Voltage	V _{SD}	I _{SD} =-1A, V _{GS} =0V	-	-0.77	-1.2	V

■ N-CHANNEL TYPICAL CHARACTERISTICS

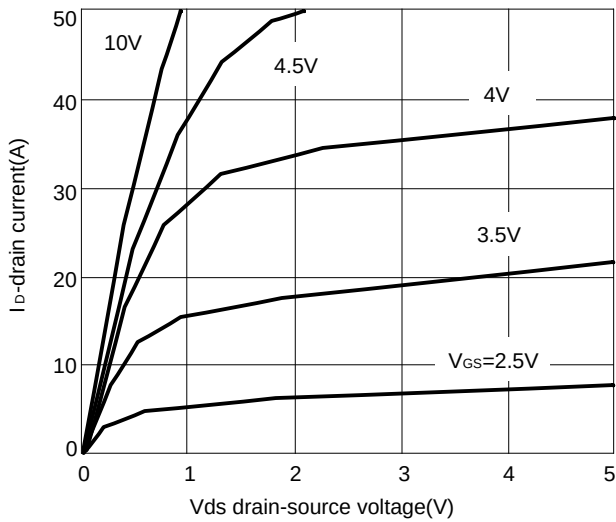


Figure 1: Output characteristics

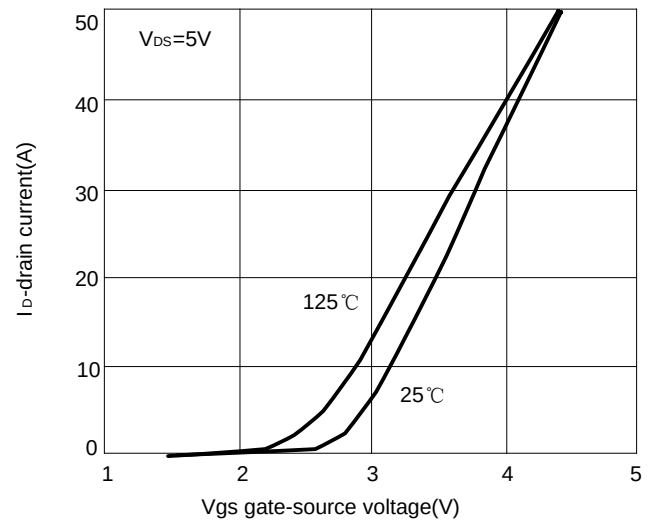


Figure 2: Transfer characteristics

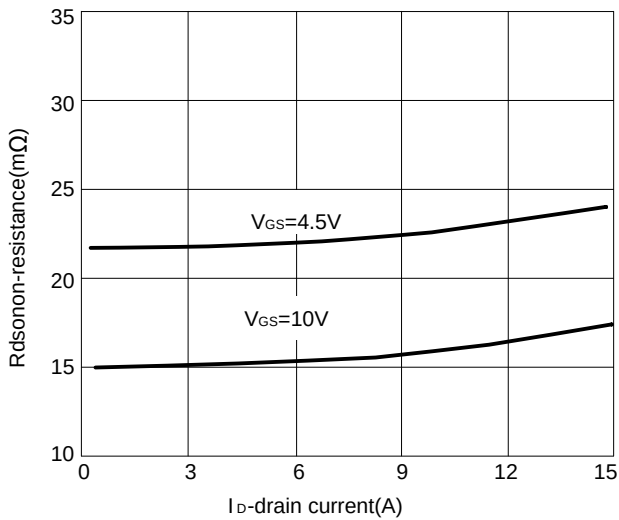


Figure 3: Drain-source on-resistance

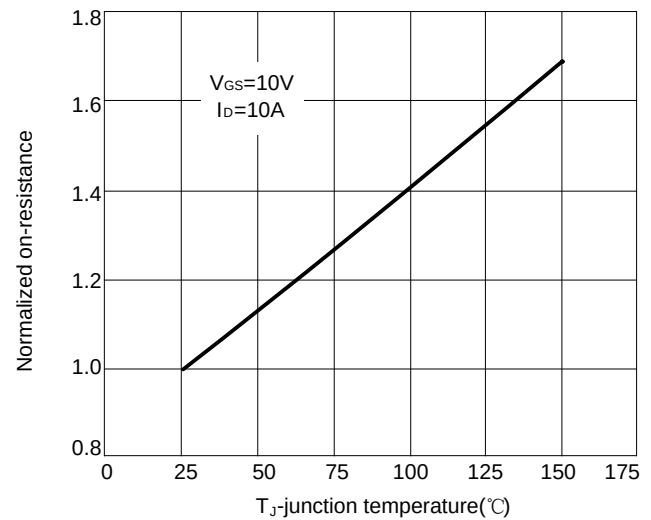


Figure 4: Drain-source on-resistance

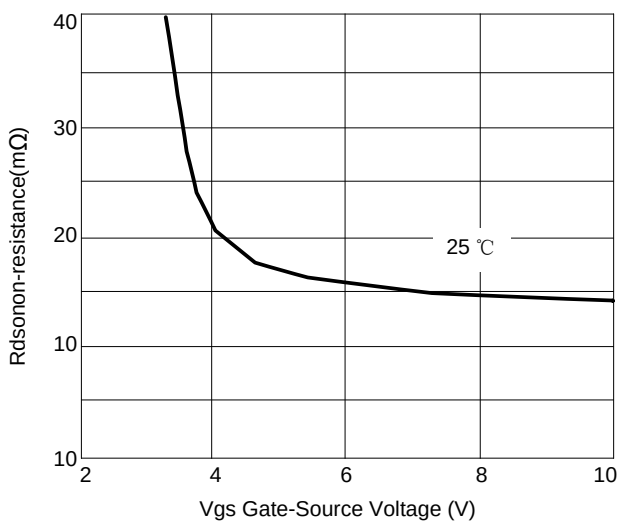


Figure 5: Rdson vs Vgs

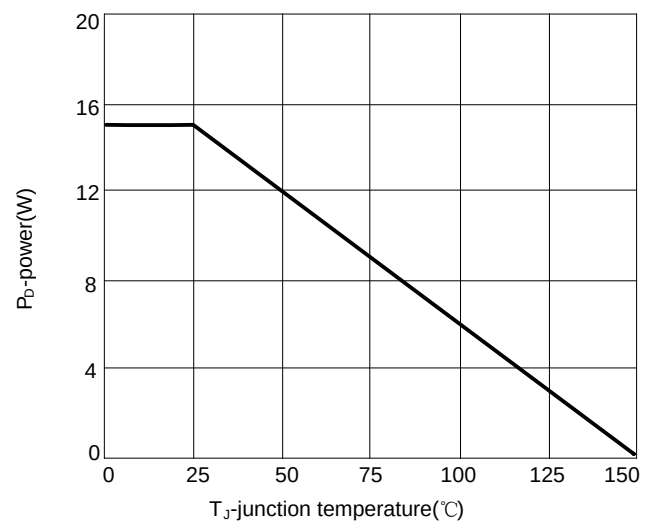


Figure 6: Power dissipation

■ N-CHANNEL TYPICAL CHARACTERISTICS(Cont.)

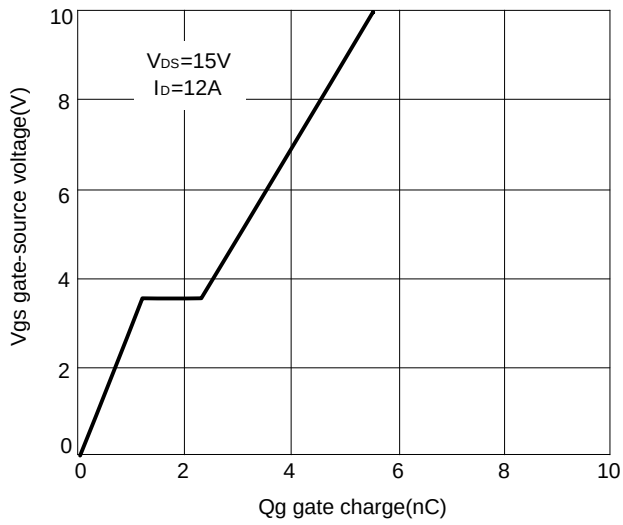


Figure 7: Gate charge

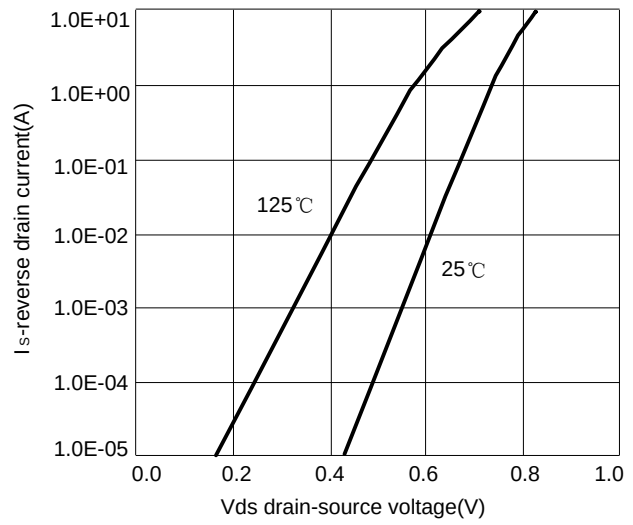


Figure 8: Source-drain diode forward

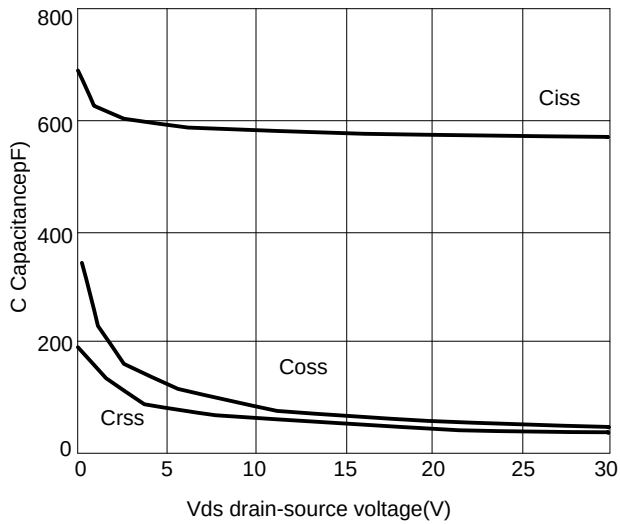


Figure 9: Safe operation safe

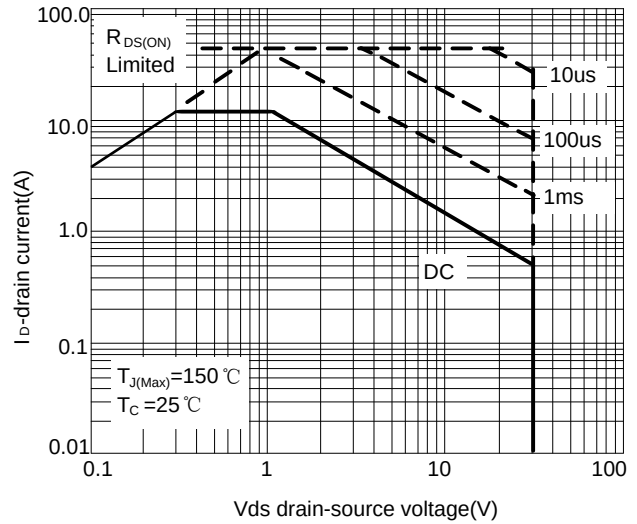


Figure 10: Safe operation safe

■ P-CHANNEL TYPICAL CHARACTERISTICS

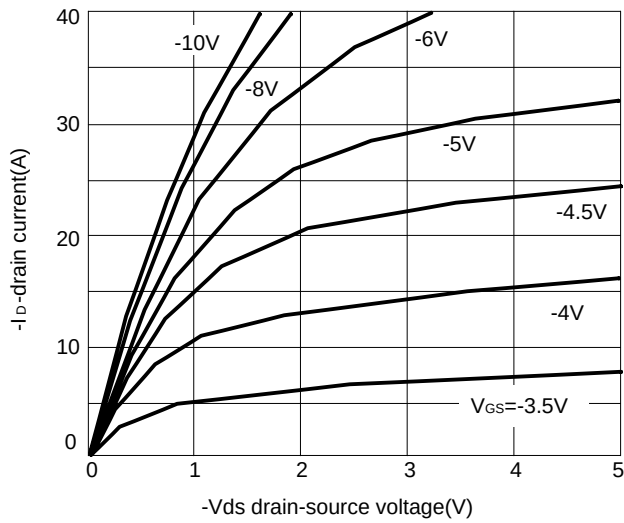


Figure 1 Output characteristics

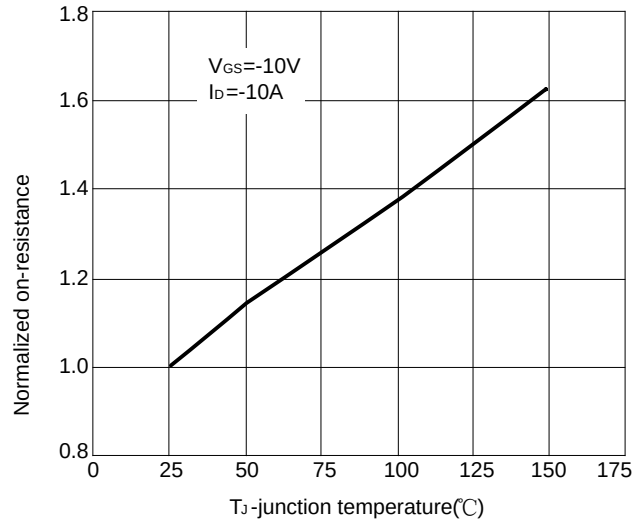


Figure 2 $R_{DS(on)}$ -junction temperature

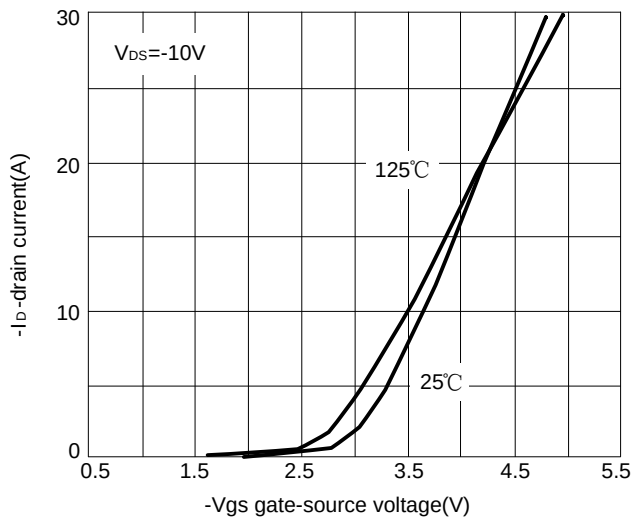


Figure 3 Transfer characteristics

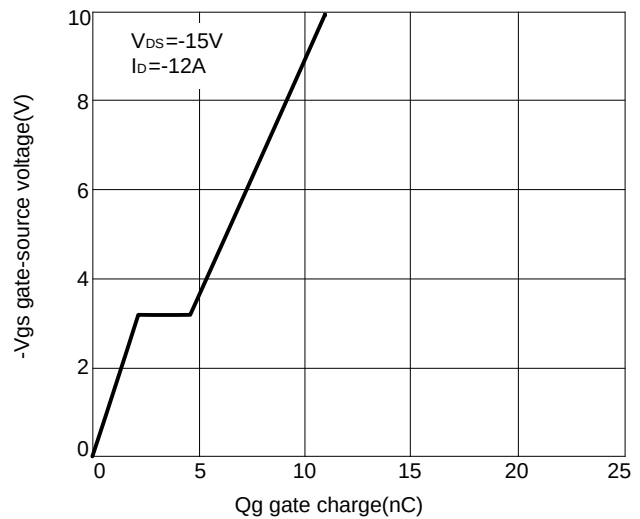


Figure 4 Gate charge

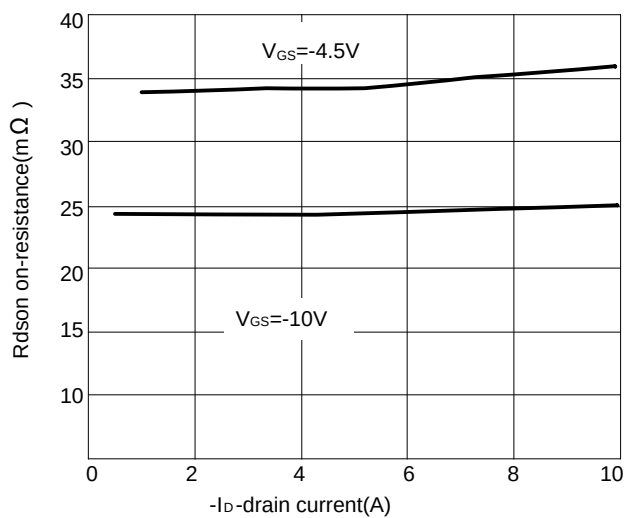


Figure 5 $R_{DS(on)}$ -drain current

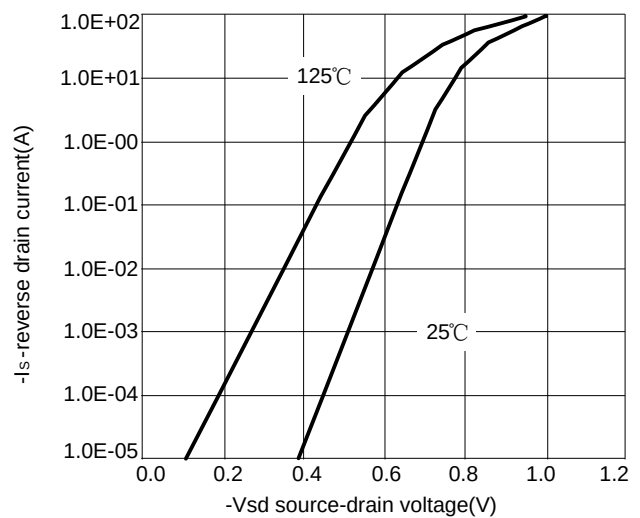


Figure 6 Source-drain diode forward

■ P-CHANNEL TYPICAL CHARACTERISTICS(Cont.)

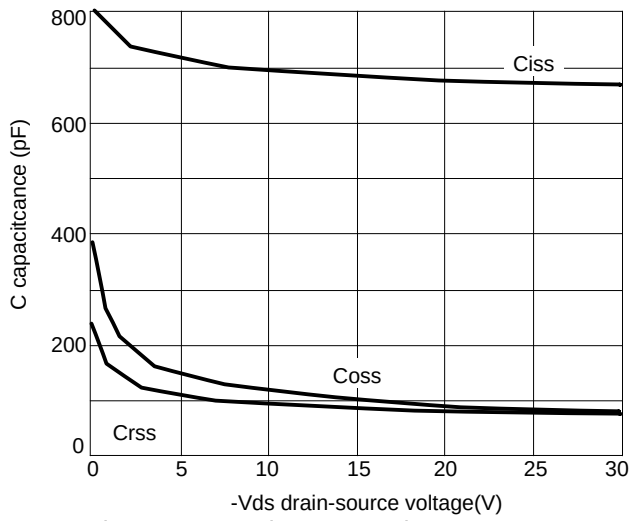


Figure 7 Capacitance vs vds

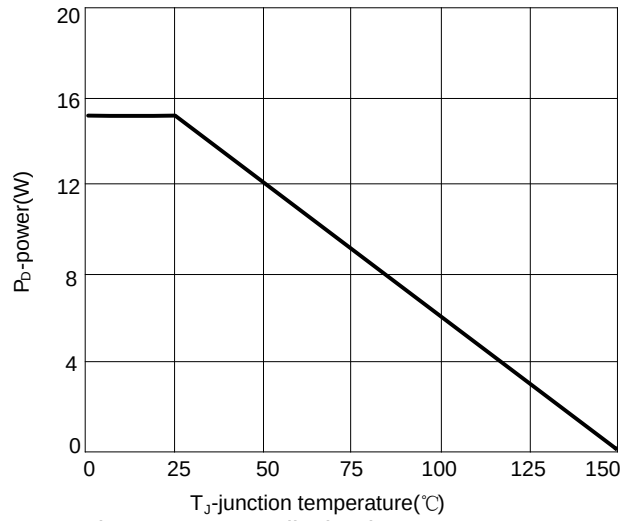


Figure 8: Power dissipation

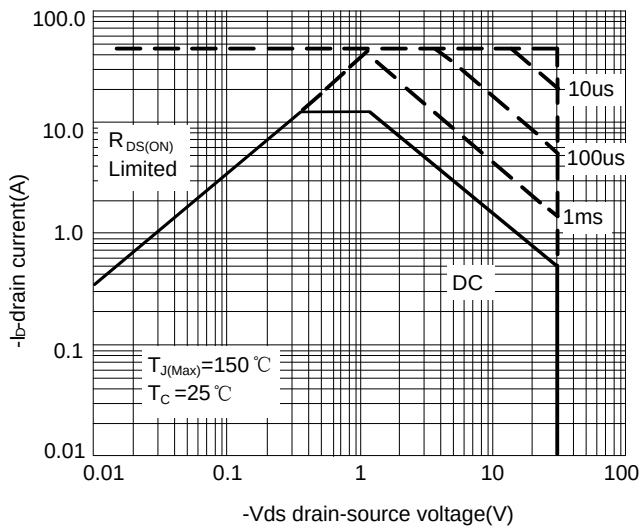


Figure 9: Safe operation safe

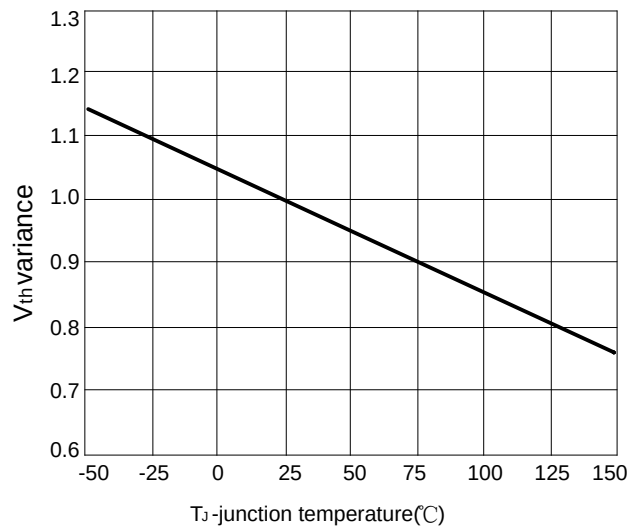
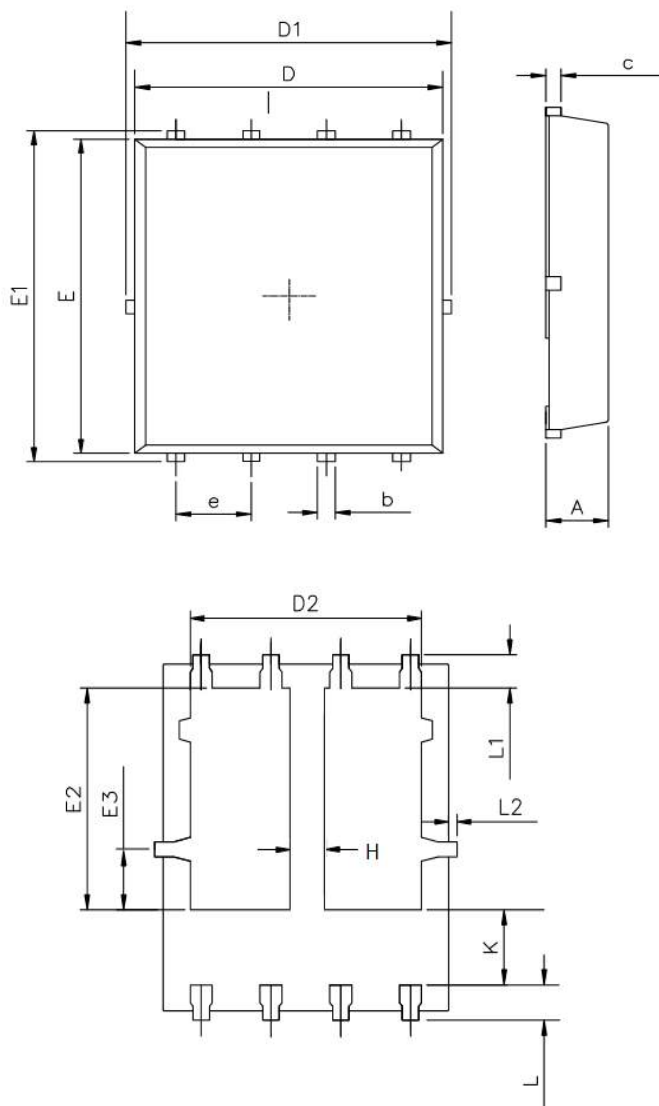


Figure 10 $V_{GS(th)}$ vs junction temperature

PDFN5X6 PACKAGE OUTLINE DIMENSIONS



UNIT:mm

	MIN	NOM	MAX
A	0.90	1.00	1.10
b	0.25	0.35	0.50
c	0.10	0.20	0.30
D	4.80	5.00	5.30
D1	4.90	5.10	5.50
D2	3.92	4.02	4.20
E	5.65	5.75	5.85
E1	5.90	6.05	6.20
E2	3.325	3.525	3.775
E3	0.80	0.90	1.00
e		1.27	
L	0.40	0.55	0.70
L1		0.65	
L2	0.00		0.15
K	1.00	1.30	1.50
H	0.5	0.6	0.7