

■ PRODUCT CHARACTERISTICS

N-CHANNEL		P-CHANNEL	
V _{DSS}	30V	V _{DSS}	-30V
R _{DS(ON)} Typ(@V _{GS} =10V)	16mΩ	R _{DS(ON)} Typ(@V _{GS} =-10V)	25mΩ
R _{DS(ON)} Typ(@V _{GS} =4.5V)	22mΩ	R _{DS(ON)} Typ(@V _{GS} =-4.5V)	34mΩ
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

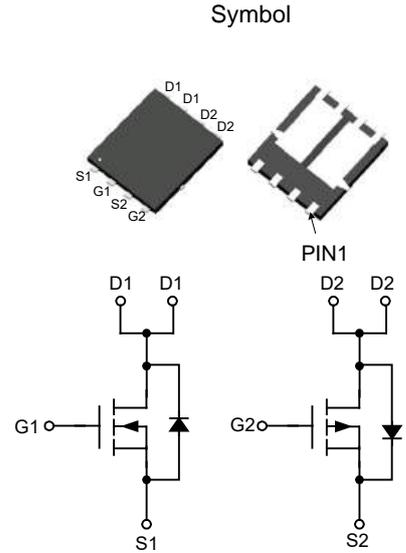
Order Codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT3029G	PDFN5X6	5000 pieces/Reel

■ ABSOLUTE MAXIMUM RATINGS(T_A=25°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} =±10V, T _A =25°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		°C
Storage Temperature	T _{STG}	-55~ +150		°C

■ THERMAL CHARACTERISTICS

Parameter	Symbol	Typ	Unit
Junction to Case	R _{thJC}	8.3	°C/W



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}	$V_{GS}=0V, I_D=-250\mu A$	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	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$	-	16	25	$m\Omega$
		$V_{GS}=4.5V, I_D=5A$	-	22	32	$m\Omega$
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	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}	$V_{DS}=5V, I_D=5A$	-	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	$t_{d(ON)}$	$V_{GS}=10V, V_{DS}=15V,$ $I_D=12A, R_G=3\Omega$	-	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}	$V_{GS}=0V, I_D=-250\mu A$	-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	m Ω
		$V_{GS}=-4.5V, I_D=-5 A$	-	34	40	m Ω
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-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}	$V_{DS}=-10V, I_D=-1 A$	-	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	$t_{d(ON)}$	$V_{GS}=-10V, V_{DS}=-15V,$ $I_D=-12 A, R_G=3\Omega$	-	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

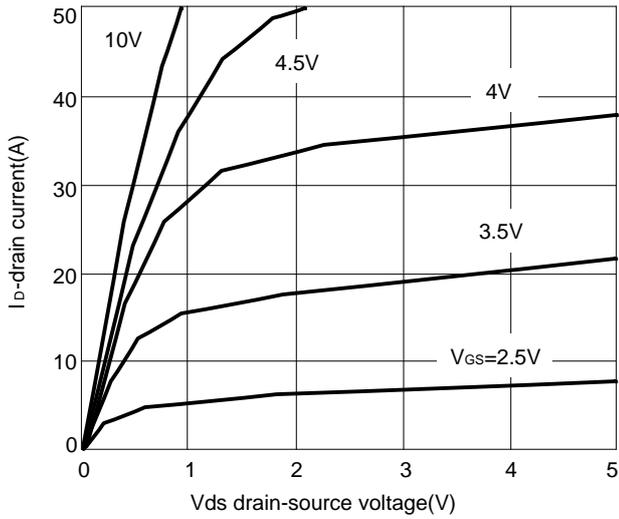


Figure 1: Output characteristics

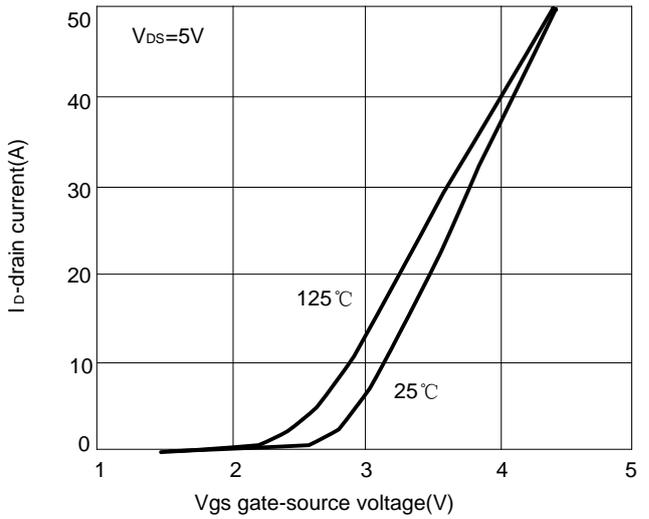


Figure 2: Transfer characteristics

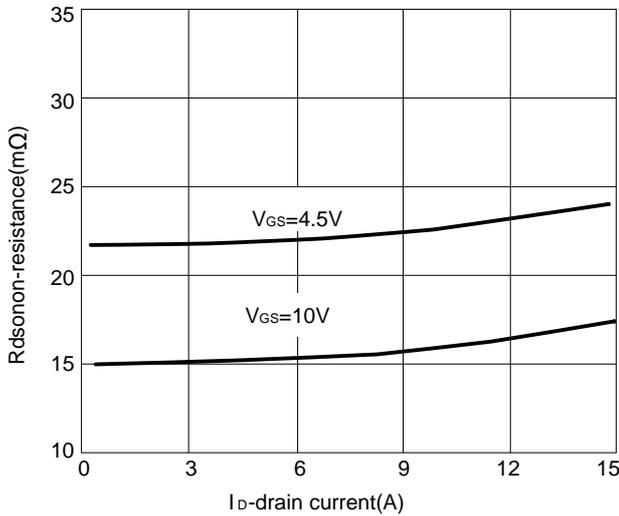


Figure 3: Drain-source on-resistance

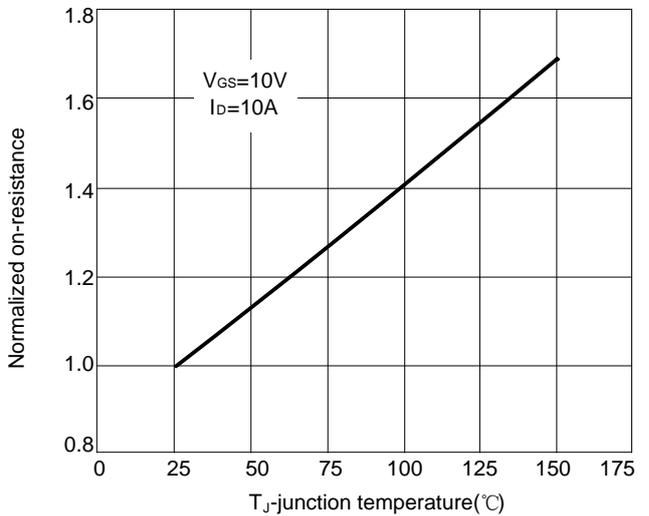


Figure 4: Drain-source on-resistance

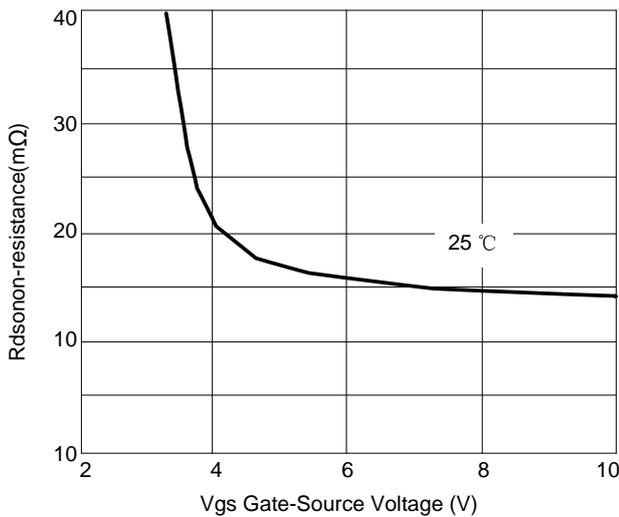


Figure 5: $R_{DS(on)}$ vs V_{GS}

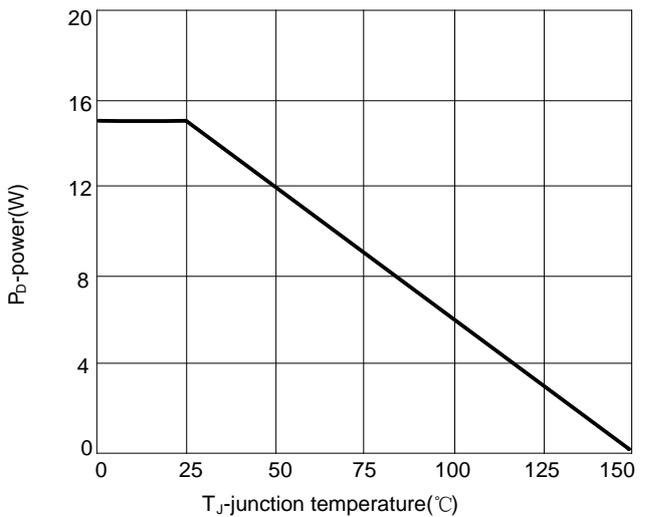


Figure 6: Power dissipation

■ N-CHANNEL TYPICAL CHARACTERISTICS(Cont.)

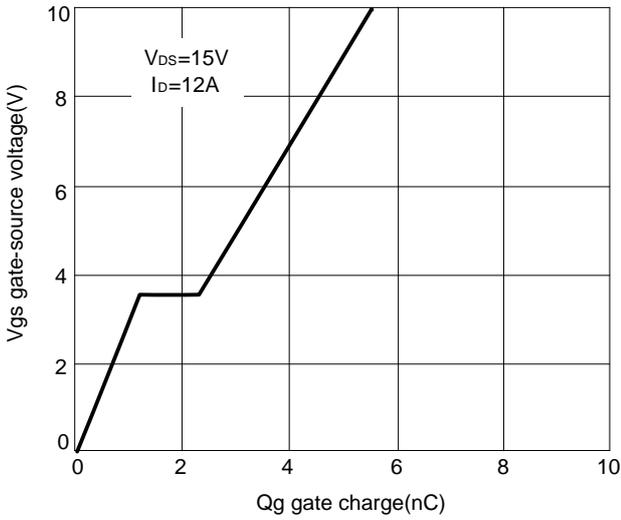


Figure 7: Gate charge

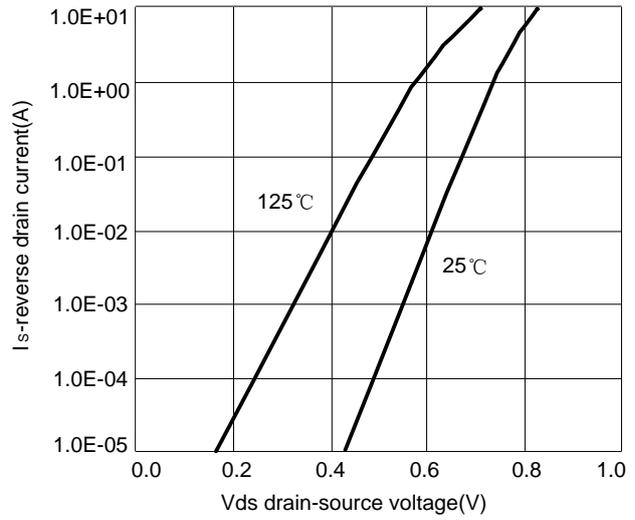


Figure 8: Source-drain diode forward

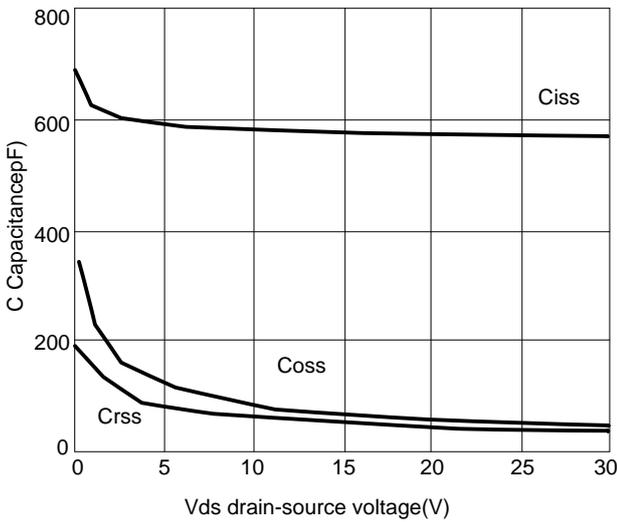


Figure 9: Safe operation safe

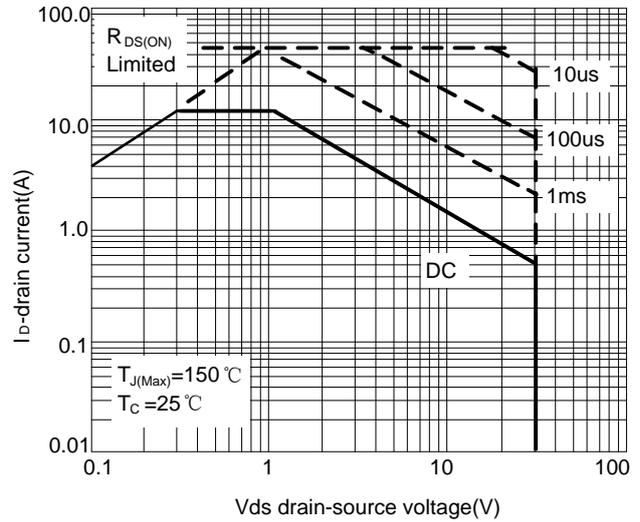


Figure 10: Safe operation safe

■ P-CHANNEL TYPICAL CHARACTERISTICS

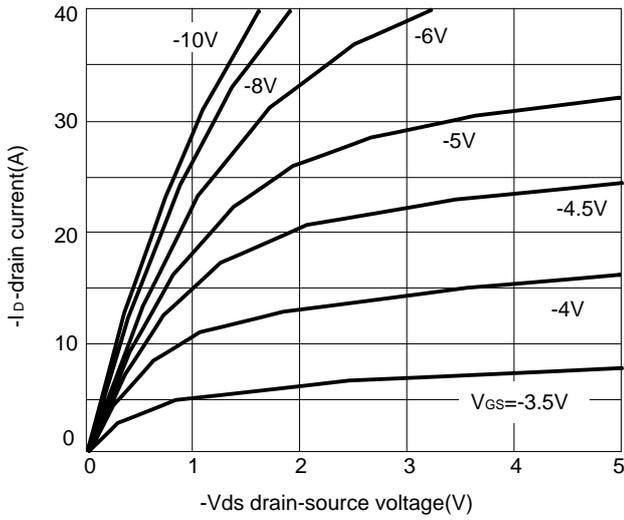


Figure 1 Output characteristics

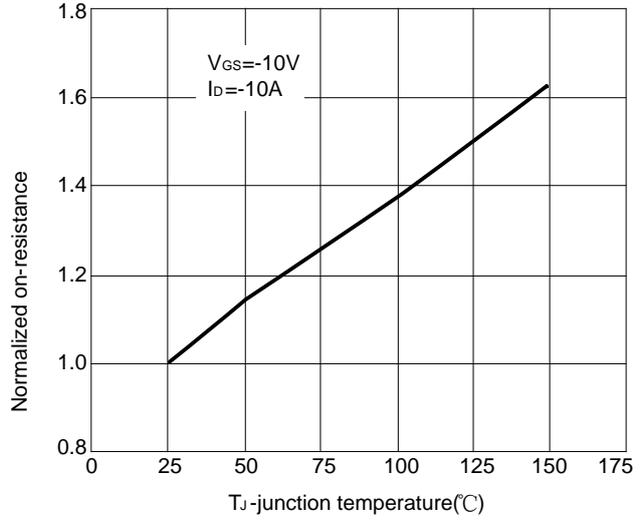


Figure 2 $R_{DS(on)}$ -junction temperature

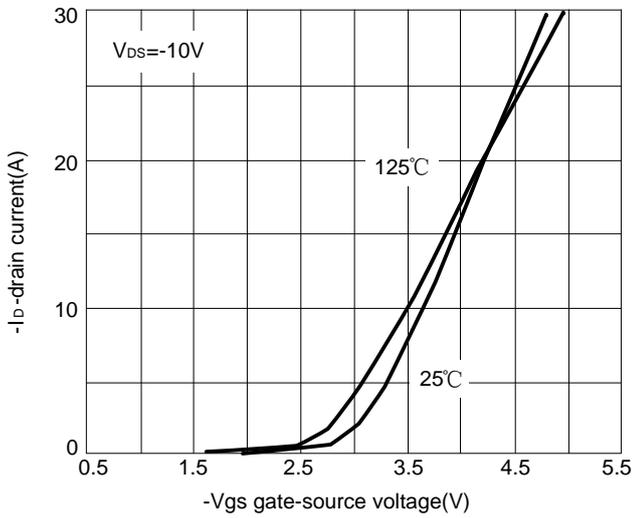


Figure 3 Transfer characteristics

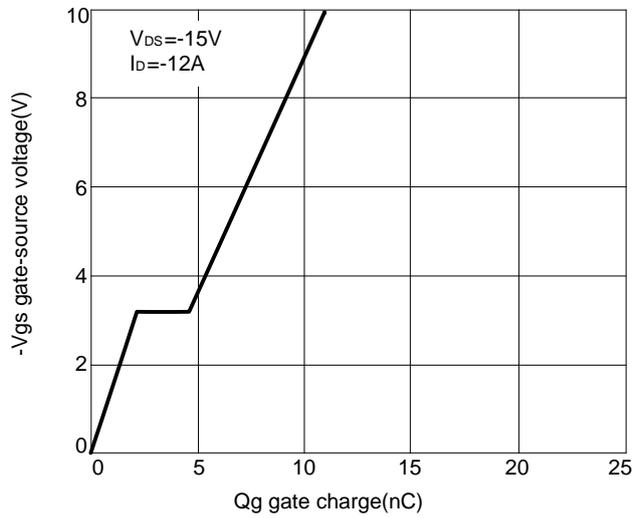


Figure 4 Gate charge

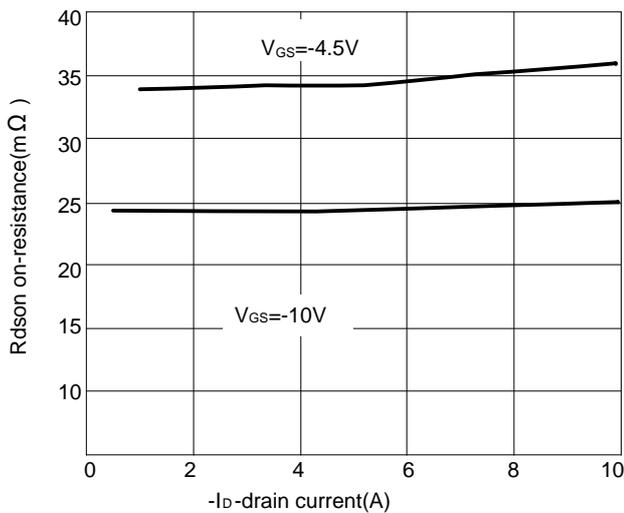


Figure 5 $R_{DS(on)}$ -drain current

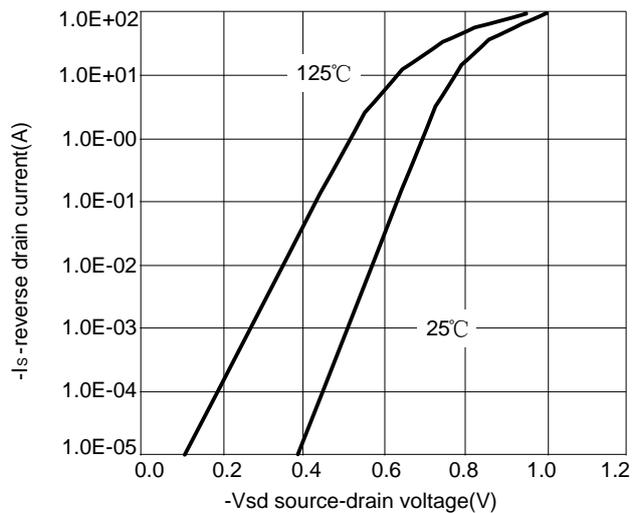


Figure 6 Source-drain diode forward

■ P-CHANNEL TYPICAL CHARACTERISTICS(Cont.)

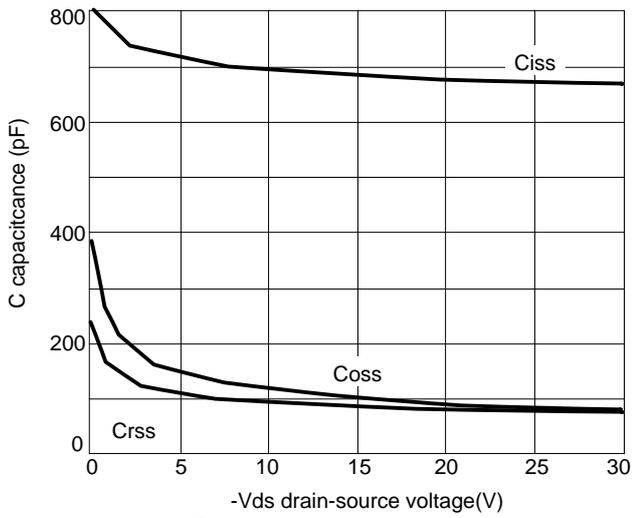


Figure 7 Capacitance vs vds

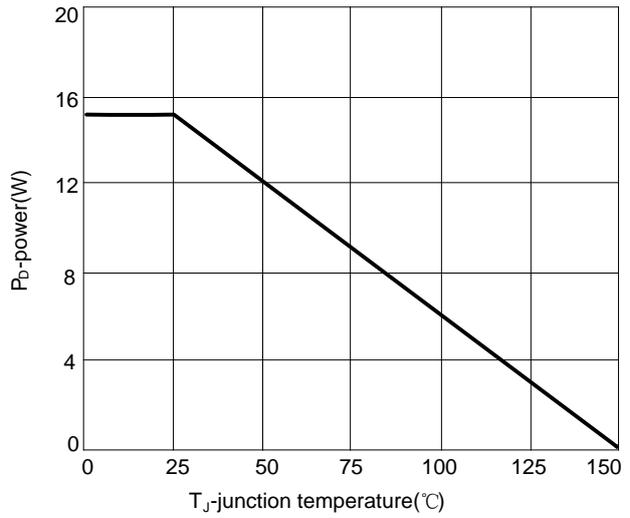


Figure 8: Power dissipation

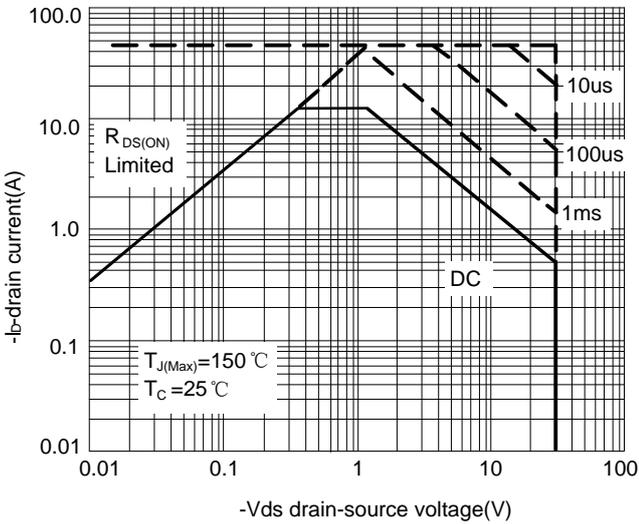


Figure 9: Safe operation safe

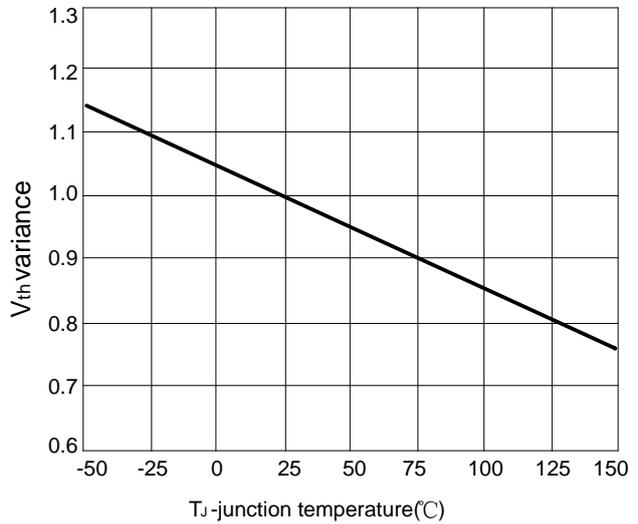
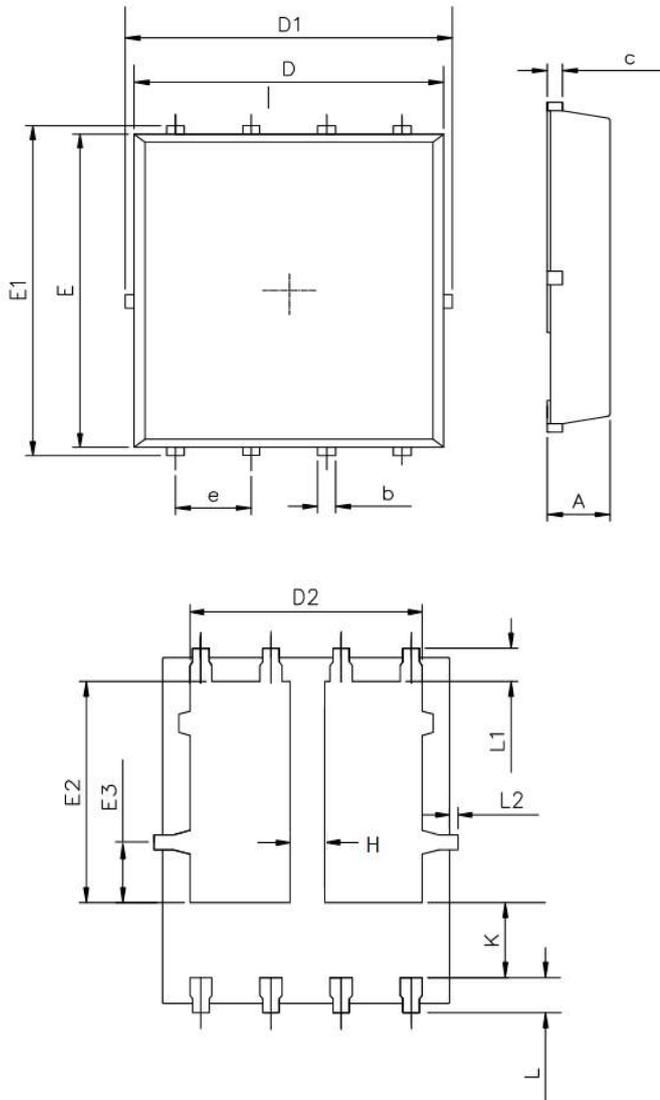


Figure 10 VGS(th) vs junction temperature

■ 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