

PRODUCT CHARACTERISTICS

N-Channel	P-Channel
$BV_{DSS} = 40V$	$BV_{DSS} = -40V$
$R_{DS(on)} (Typ@V_{GS} = 10V) < 12m\Omega$	$R_{DS(on)} (Typ@V_{GS} = -10V) < 29m\Omega$
$R_{DS(on)} (Typ@V_{GS} = 4.5V) < 17m\Omega$	$R_{DS(on)} (Typ@V_{GS} = -4.5V) < 34m\Omega$

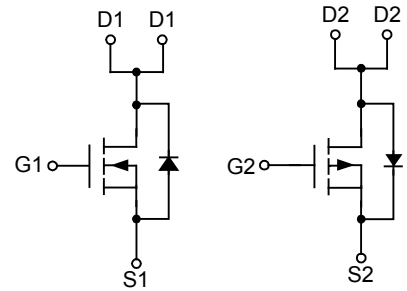
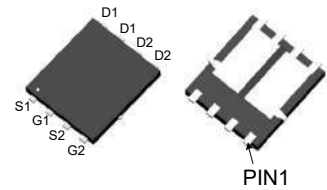
APPLICATIONS

- Motor Drive
- DC-DC Converter

FEATURES

- Advanced trench cell design
- Low thermal resistance

Pin description



N+P MOSFET

ORDER INFORMATION

Order codes		Package	Packing
Halogen-free	Halogen		
N/A	MOT4633G	PDFN5X6-8L	5000pieces/Reel

ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ C$ unless otherwise specified)

Parameter	Symbol	N-Channel	P-Channel	Unit
Drain-Source Voltage	V_{DS}	40	-40	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Continuous Drain Current	$T_C=25^\circ C$	28	-15	A
	$T_C=100^\circ C$	19.8	-10.6	A
Pulsed Drain Current	$T_C=25^\circ C$	70	-60	A
Maximum Power Dissipation	P_D	35		W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	3.6		$^\circ C/W$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150		$^\circ C$

■ N-Channel Electrical Characteristics ($T_c=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =250μA	40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =40V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.4	2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =15A	-	12	17	mΩ
		V _{GS} =4.5V, I _D =10A	-	17	25	mΩ
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =15A	-	7	-	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =20V, V _{GS} =0V, F=1.0MHz	-	1163	-	PF
Output Capacitance	C _{oss}		-	104	-	PF
Reverse Transfer Capacitance	C _{rss}		-	100	-	PF
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	V _{DD} =20V ,R _L =2.5Ω	-	5.5	-	nS
Turn-on Rise Time	t _r		-	14	-	nS
Turn-Off Delay Time	t _{d(off)}	V _{GS} =10V, R _G =3Ω	-	24	-	nS
Turn-Off Fall Time	t _f		-	12	-	nS
Total Gate Charge	Q _g	V _{DS} =20V, I _D =15A, V _{GS} =10V	-	28	-	nC
Gate-Source Chrg	Q _{gs}		-	3.9	-	nC
Gate-Drain Charge	Q _{gd}		-	5.9	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =15A	-	-	1.2	V
Diode Forward Current	I _S		-	-	28	A

■ N-TYPICAL CHARACTERISTICS

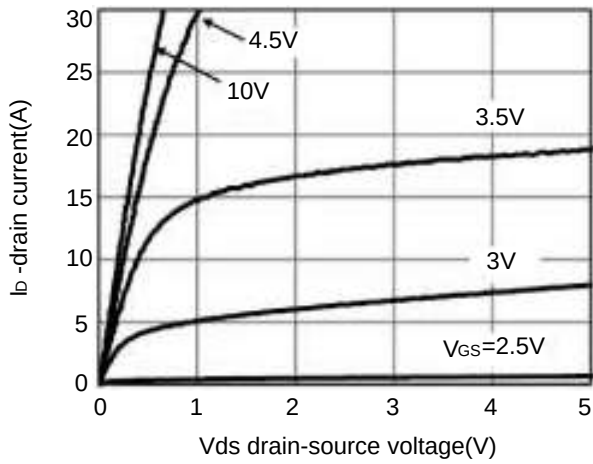


Figure1:output characteristics

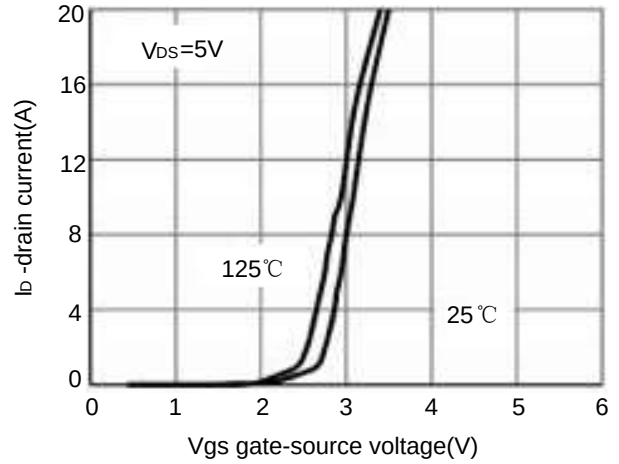


Figure2:transfer characteristics

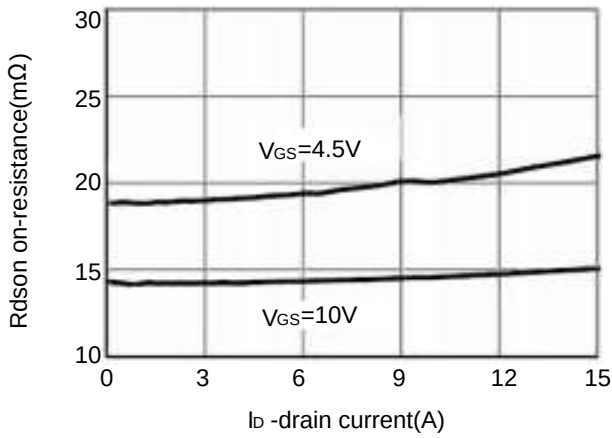


Figure3:drain-source on-resistance

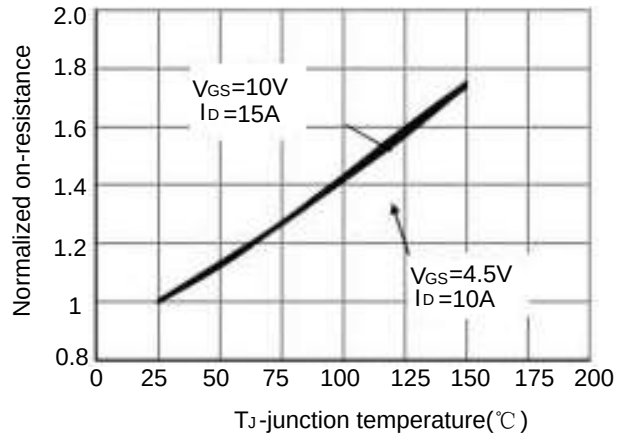


Figure4:drain-source on-resistance

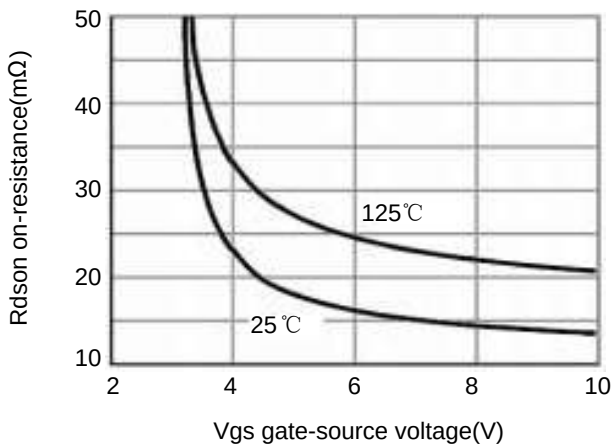


Figure5:rdson vs vgs

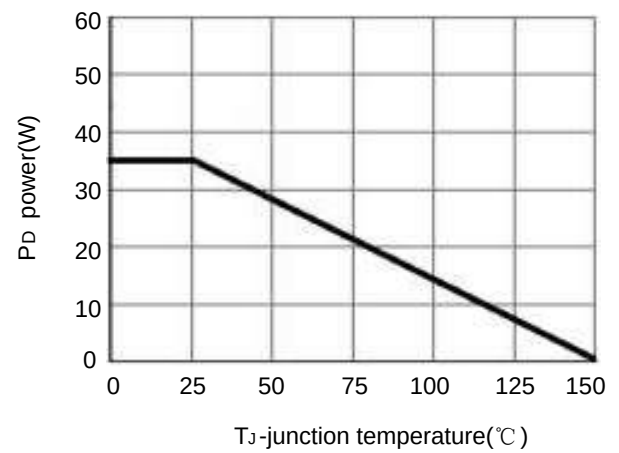


Figure6:power dissipation

■ N-TYPICAL CHARACTERISTICS(Cont.)

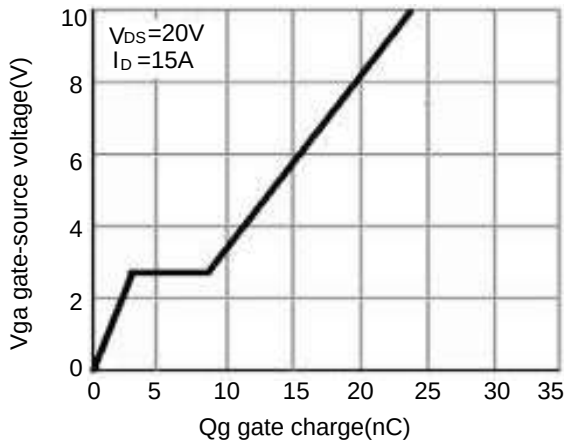


Figure 7: gate charge

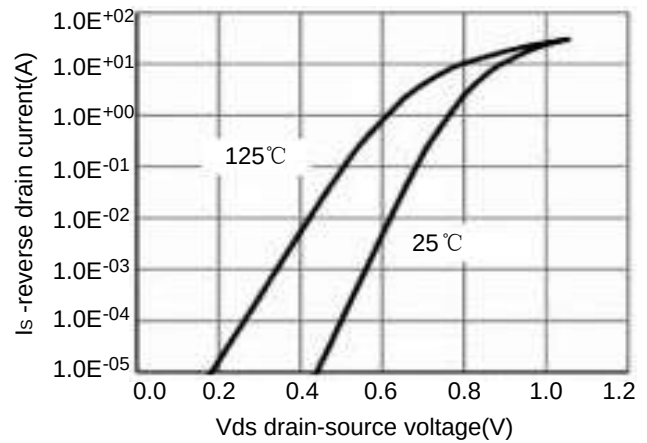


Figure 8: source-drain diode forward

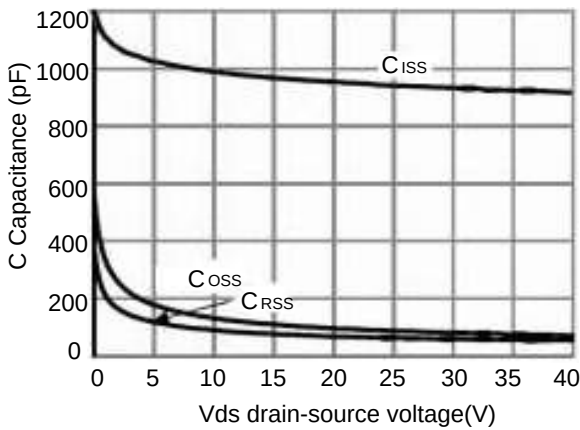


Figure 9: capacitance vs vds

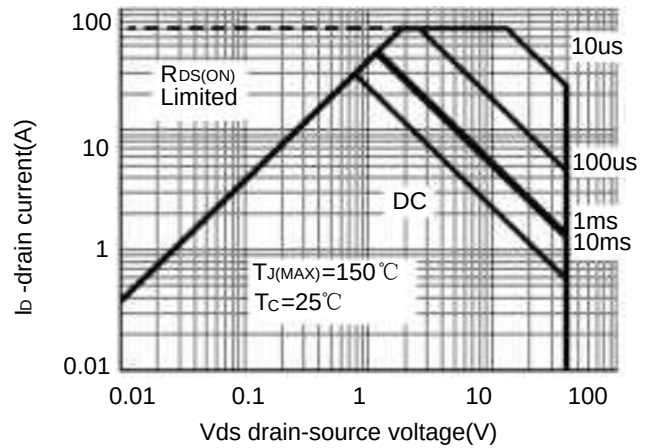


Figure 10: safe operation area

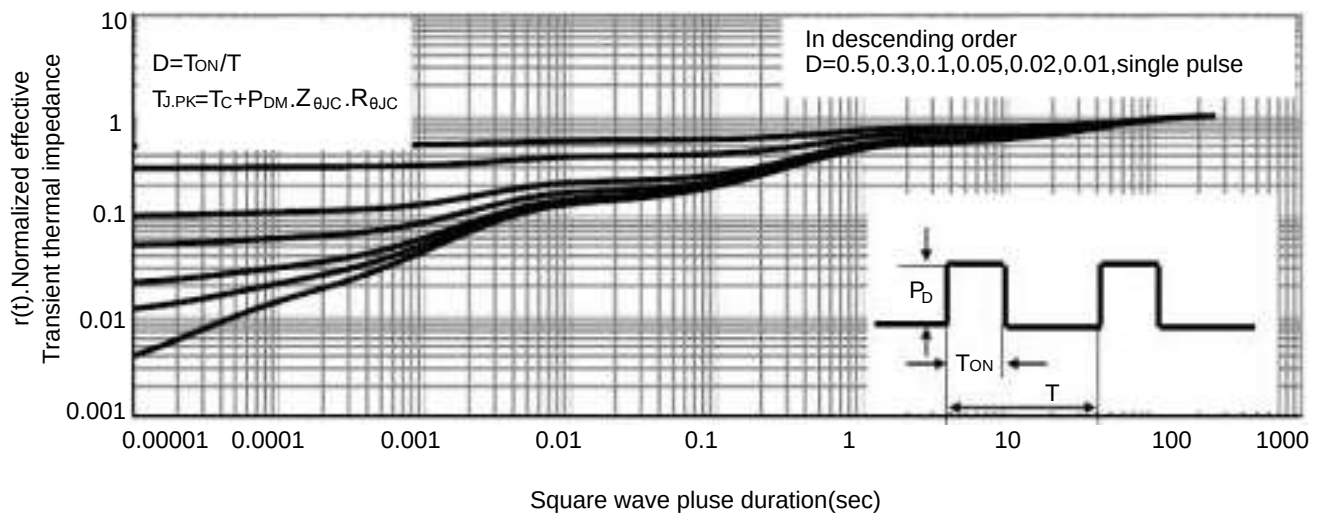


Figure 11 Normalized maximum transient thermal impedance

■ P-Channel Electrical Characteristics ($T_c=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-40V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.5	-2.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-7A$	-	29	35	m Ω
		$V_{GS}=-4.5V, I_D=-4A$	-	34	45	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-7A$	20	-	-	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=-20V, V_{GS}=0V,$ $F=1.0MHz$	-	1060	-	PF
Output Capacitance	C_{oss}		-	121	-	PF
Reverse Transfer Capacitance	C_{rss}		-	111	-	PF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-20V, R_L=2.3\Omega$	-	5.5	-	nS
Turn-on Rise Time	t_r		-	14	-	nS
Turn-Off Delay Time	$t_{d(off)}$	$V_{GS}=-10V, R_{GEN}=6\Omega$	-	24	-	nS
Turn-Off Fall Time	t_f		-	12	-	nS
Total Gate Charge	Q_g	$V_{DS}=-20V, I_D=-7A$ $V_{GS}=-10V$	-	26	-	nC
Gate-Source Charge	Q_{gs}		-	3.7	-	nC
Gate-Drain Charge	Q_{gd}		-	6.0	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_S=-10A$	-	-	1.2	V

■ P-TYPICAL CHARACTERISTICS

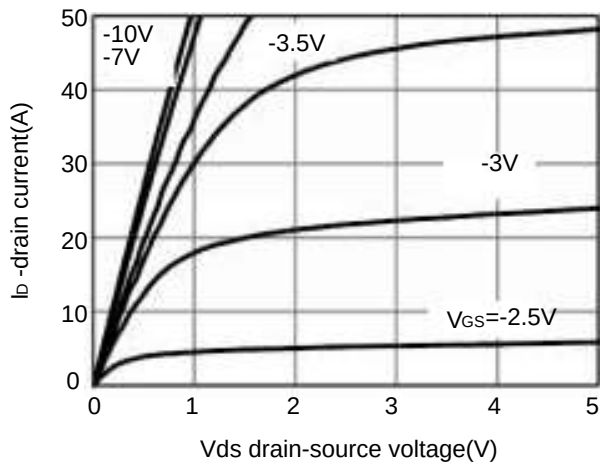


Figure1:output characteristics

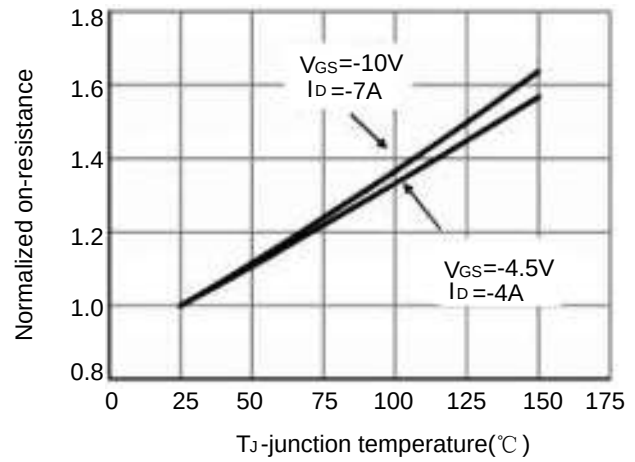


Figure2:drain-source on-resistance

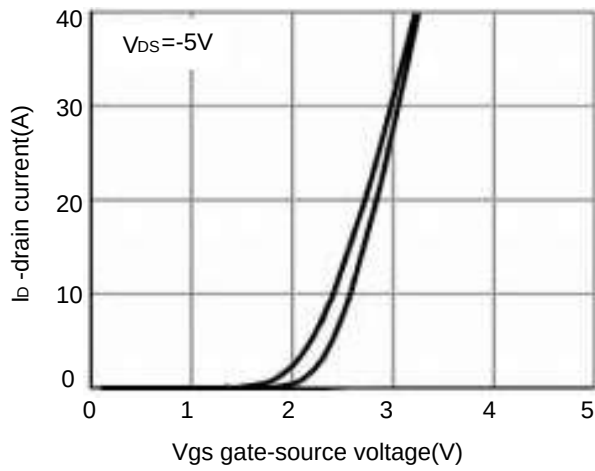


Figure3:transfer characteristics

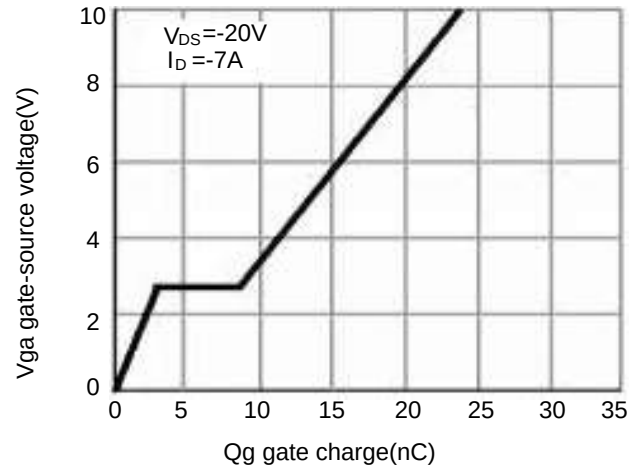


Figure4:gate charge

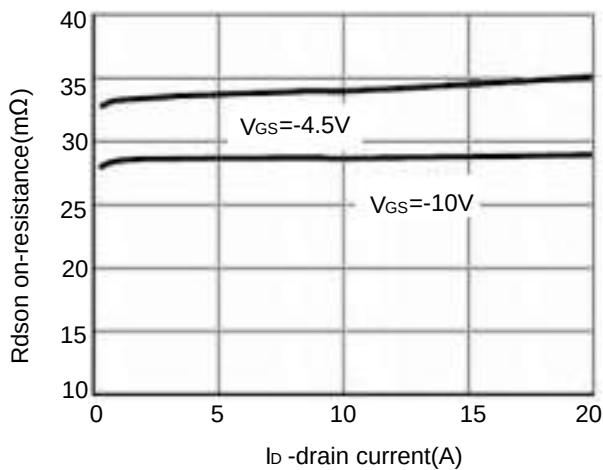
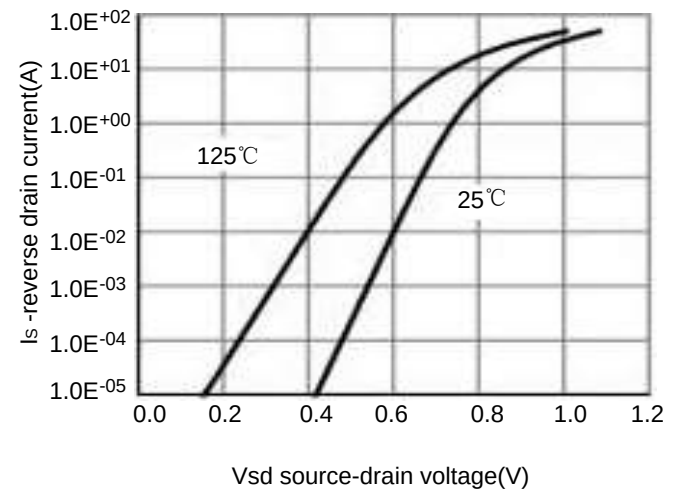
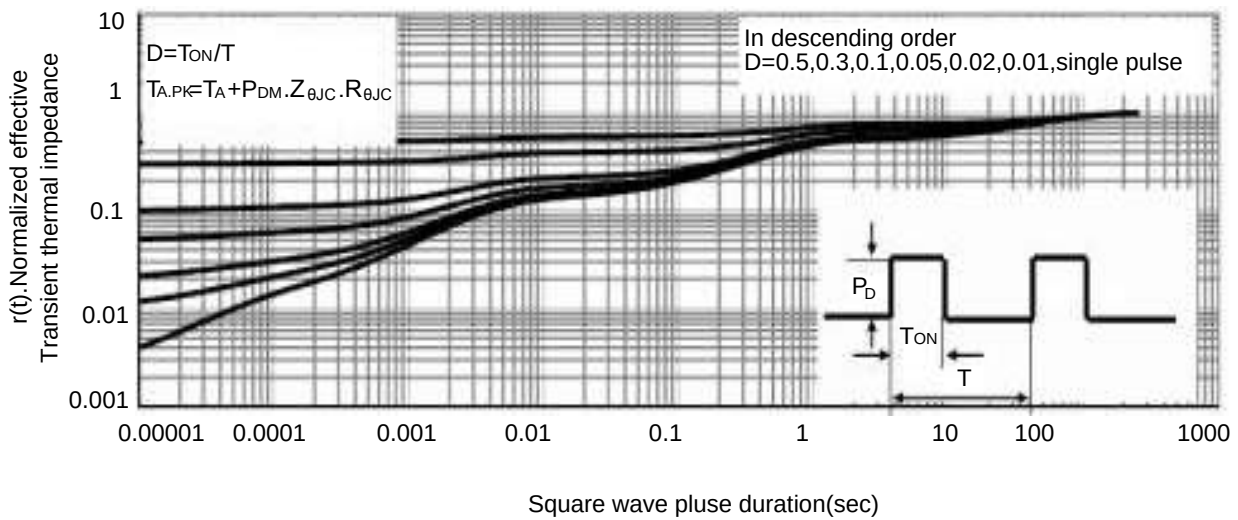
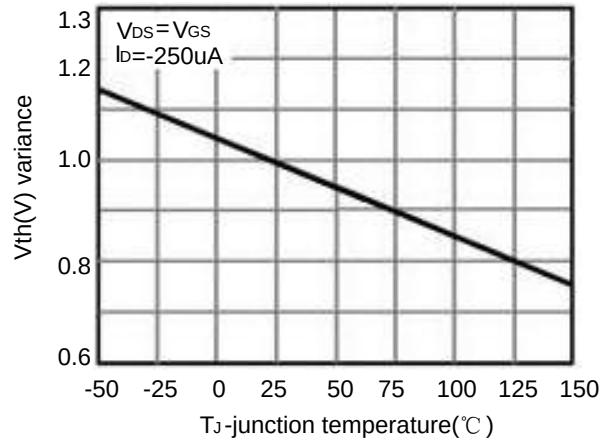
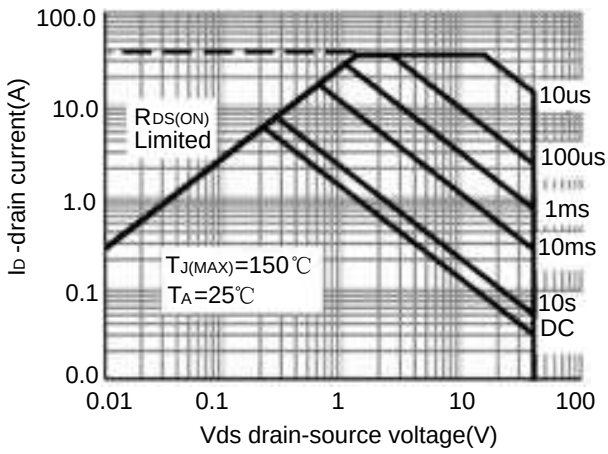
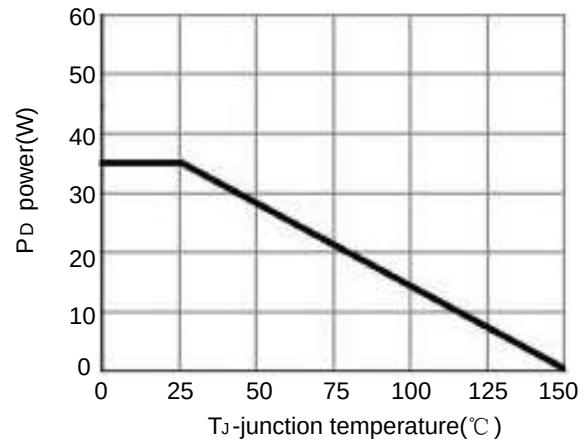
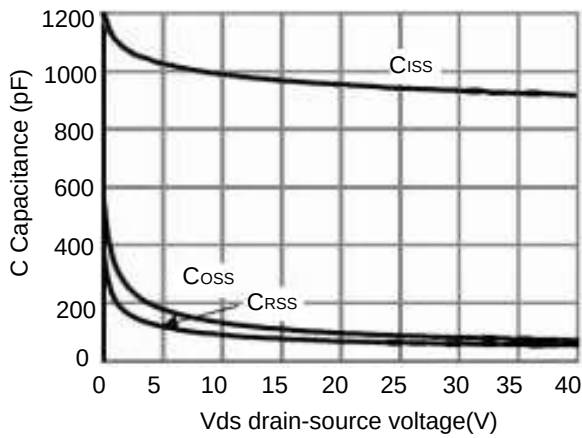


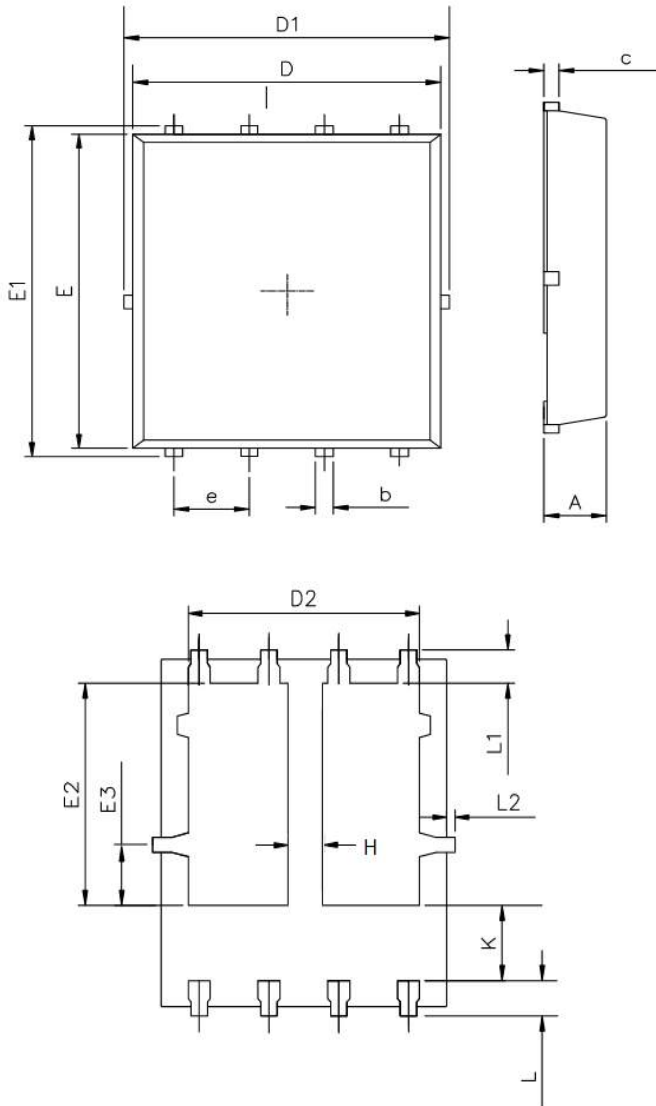
Figure3:drain-source on-resistance



■ P-TYPICAL CHARACTERISTICS(Cont.)



■ PDFN5X6-8L Package Mechanical Data



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