

CMS3439KDW-HF

N and P-Channel

RoHS Device

Halogen Free



Features

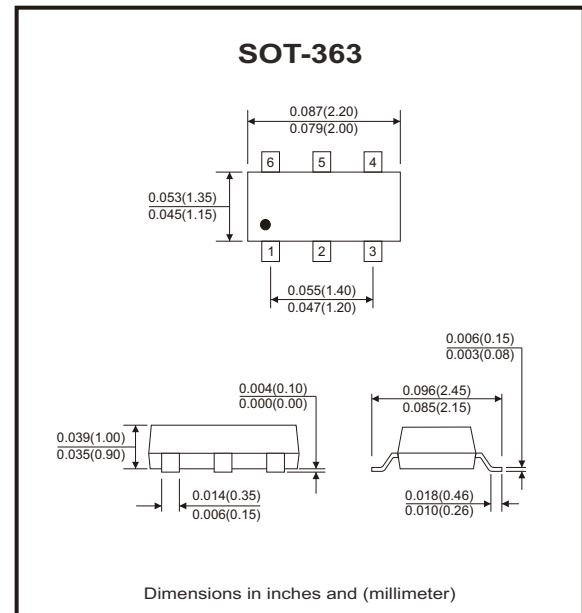
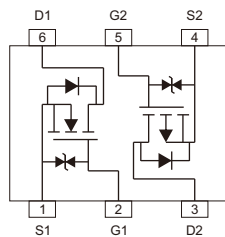
- Low on-resistance.
- Low gate charge.
- ESD protected gate, typical 4kV (HBM).

Mechanical data

- Case: SOT-363, molded plastic.
- Terminals: Tin plated, solderable per MIL-STD-750, method 2026.
- Mounting position: Any.

Circuit Diagram

G : Gate
S : Source
D : Drain



Maximum Ratings (at TA=25°C unless otherwise noted)

Parameter		Symbol	N-Channel	P-Channel	Unit
Drain-source voltage		V _{DS}	20	-20	V
Gate-source voltage		V _{GS}	±8	±8	V
Continuous drain current	T _A = 25°C, V _{GS} = 4.5V (-4.5V)	I _D	0.8	-0.5	A
	T _A = 70°C, V _{GS} = 4.5V (-4.5V)		0.65	-0.4	
Pulsed drain current (Note 1)		I _{DM}	3.2	-2	A
Continuous body diode forward current @ T _A = 25°C		I _S	0.35	-0.35	A
ESD susceptibility (Note 2)		V _{ESD}	4000		V
Total power dissipation	T _A = 25°C	P _D	0.42		W
	T _A = 70°C		0.27		
Thermal resistance, junction to ambient		R _{θJA}	300		°C/W
Operating junction and storage temperature range		T _J , T _{STG}	-55 to +150		°C

Notes: 1. Repetitive rating, pulse width limited by junction temperature $T_J(\max)=150^\circ\text{C}$.
Rating are based on low frequency and low duty cycles to keep initial $T_J=25^\circ\text{C}$.

2. Human body model, 1.5kΩ in series with 100pF.

N-Channel Electrical Characteristics (at TA=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	20			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	0.4		1.2	V
Forward transconductance	G _{FS}	V _{DS} = 5V, I _D = 0.2A		0.8		S
Gate-source leakage	I _{GSS}	V _{GS} = ±8V, V _{DS} = 0V			±10	μA
Zero gate voltage drain current	I _{DSS}	V _{DS} = 16V, V _{GS} = 0V			1	μA
Static Drain-source on-state resistance	R _{DS(ON)}	V _{GS} = 4.5V, I _D = 0.2A		0.32	0.45	Ω
		V _{GS} = 2.5V, I _D = 0.2A		0.4	0.6	
		V _{GS} = 1.8V, I _D = 10mA		0.7	1.2	
Dynamic						
Input capacitance	C _{iss}	V _{DS} = 10V, V _{GS} = 0V, f = 1MHz		33		pF
Output capacitance	C _{oss}			15		
Reverse transfer capacitance	C _{rss}			13		
Total gate charge (Note 1, 2)	Q _g	V _{DS} = 20V, I _D = 0.6A, V _{GS} = 4.5V		0.9		nC
Gate-source charge (Note 1, 2)	Q _{gs}			0.2		
Gate-drain charge (Note 1, 2)	Q _{gd}			0.2		
Turn-on delay time (Note 1, 2)	t _{d(ON)}	V _{DS} = 10V, I _D = 0.2A, V _{GS} = 4.5V, R _{GS} = 10Ω		5		ns
Rise time (Note 1, 2)	t _r			17		
Turn-off delay time (Note 1, 2)	t _{d(OFF)}			20		
Fall time (Note 1, 2)	t _f			20		
Source-Drain Diode						
Diode forward voltage (Note 1)	V _{SD}	I _S = 0.2A, V _{GS} = 0V		0.85	1.2	V
Reverse recovery time	t _{rr}	I _F = 0.5A, dI _F /dI = 100A/μs		5		ns
Recovered charge	Q _{rr}			1		nC

Notes: 1. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

2. Independent of operating temperature.

P-Channel Electrical Characteristics (at TA=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D = -250μA	-20			V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.4		-1.2	V
Forward transconductance	G _{FS}	V _{DS} = -5V, I _D = -0.4A		1		S
Gate-source leakage	I _{GSS}	V _{GS} = ±8, V _{DS} = 0V			±10	μA
Zero gate voltage drain current	I _{DSS}	V _{DS} = -16V, V _{GS} = 0V			-1	μA
Static Drain-source on-state resistance	R _{DS(ON)}	V _{GS} = -4.5V, I _D = -0.2A		0.75	1.1	Ω
		V _{GS} = -2.5V, I _D = -0.2A		0.9	1.5	
		V _{GS} = -1.8V, I _D = -10mA		1.1	2.5	
Dynamic						
Input capacitance	C _{iss}	V _{DS} = -10V, V _{GS} = 0V, f = 1MHz		45		pF
Output capacitance	C _{oss}			15		
Reverse transfer capacitance	C _{rss}			8		
Total gate charge (Note 1, 2)	Q _g	V _{DS} = -20V, I _D = -0.4A, V _{GS} = -4.5V		1		nC
Gate-source charge (Note 1, 2)	Q _{gs}			0.2		
Gate-drain charge (Note 1, 2)	Q _{gd}			0.2		
Turn-on delay time (Note 1, 2)	t _{d(ON)}	V _{DS} = -10V, I _D = -0.2A, V _{GS} = -4.5V, R _{GS} = 10Ω		11		ns
Rise time (Note 1, 2)	t _r			20		
Turn-off delay time (Note 1, 2)	t _{d(OFF)}			45		
Fall time (Note 1, 2)	t _f			35		
Source-Drain Diode						
Diode forward voltage (Note 1)	V _{SD}	I _S = -0.4A, V _{GS} = 0V		-0.9	-1.2	V

Notes: 1. Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.

2. Independent of operating temperature.

N-Channel Typical Rating and Characteristic Curves (CMS3439KDW-HF)

Fig.1 - Typical Output Characteristics

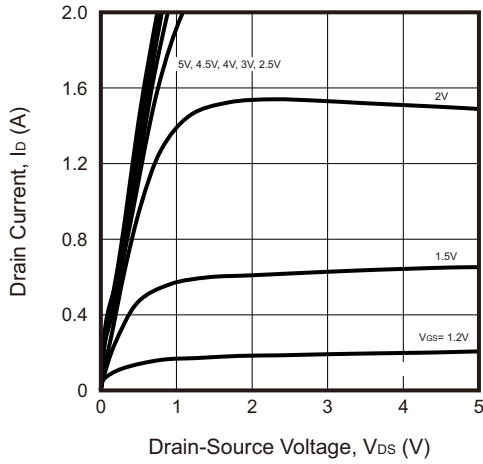


Fig.2 - Breakdown Voltage vs Junction Temperature

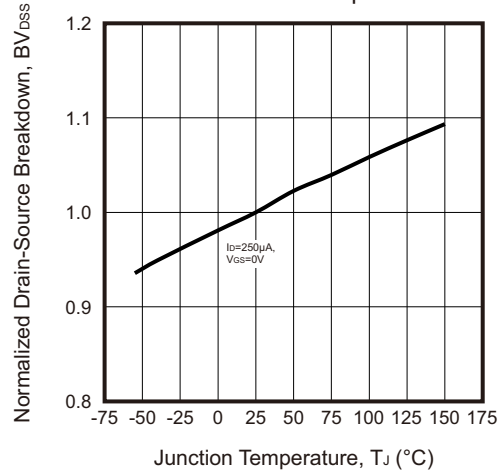


Fig.3 - Static Drain-Source On-State Resistance vs Drain Current

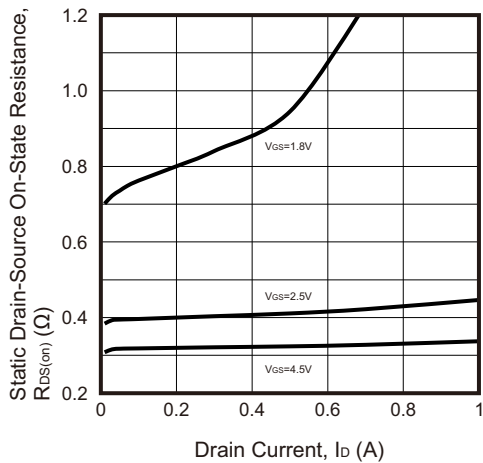


Fig.4 - Body Diode Current vs Source-Drain Voltage

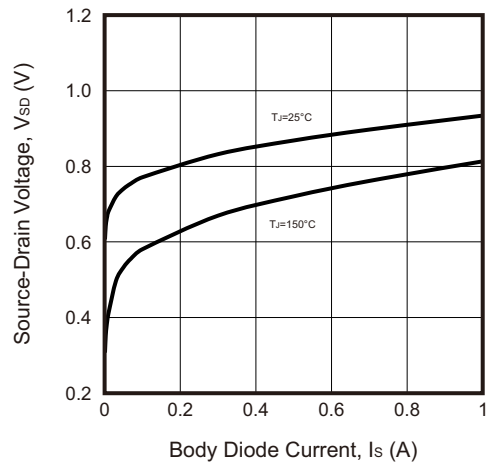


Fig.5 - Static Drain-Source On-State Resistance vs Gate-Source Voltage

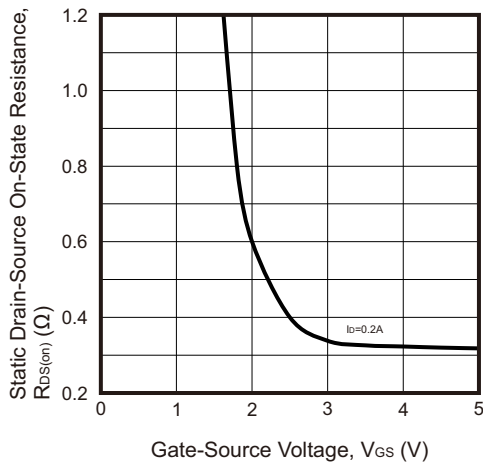
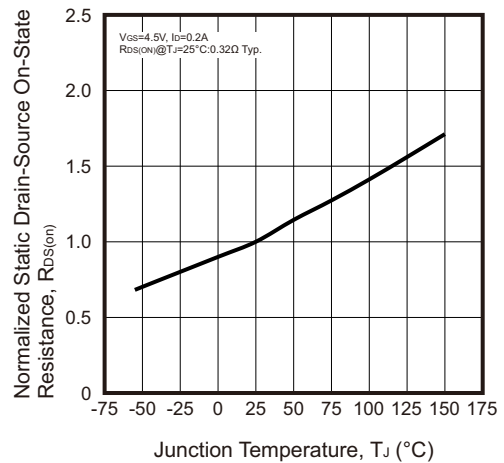


Fig.6 - Drain-Source On-State Resistance vs Junction Temperature



N-Channel Typical Rating and Characteristic Curves (CMS3439KDW-HF)

Fig.7 - Capacitance vs Drain-to-Source Voltage

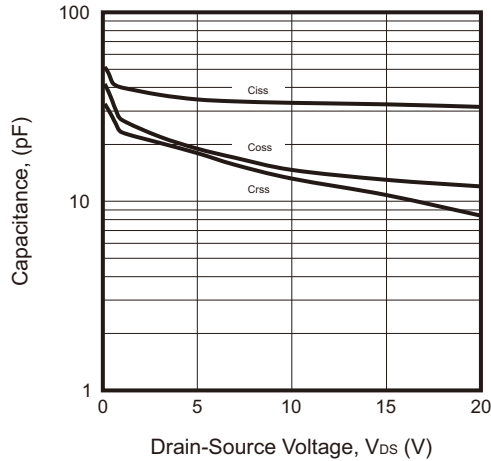


Fig.8 - Threshold Voltage vs Junction Temperature

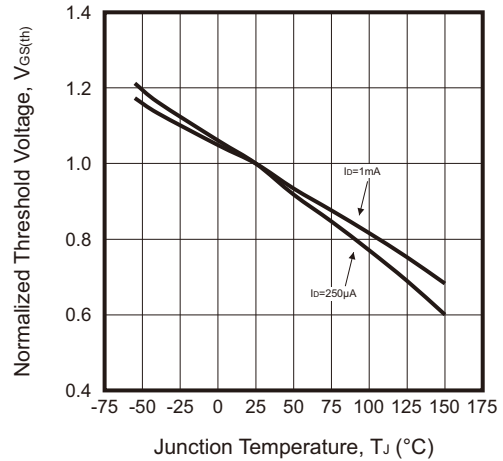


Fig.9 - Forward Transfer Admittance vs Drain Current

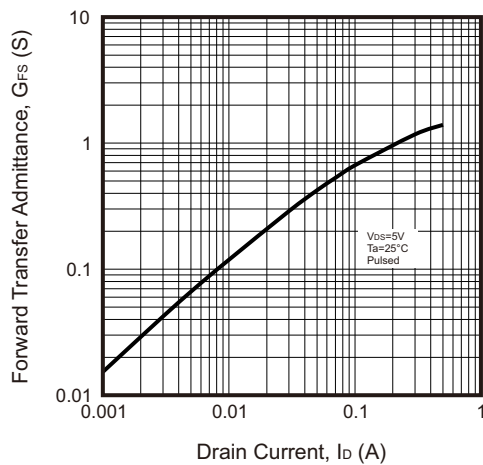


Fig.10 - Gate Charge Characteristics

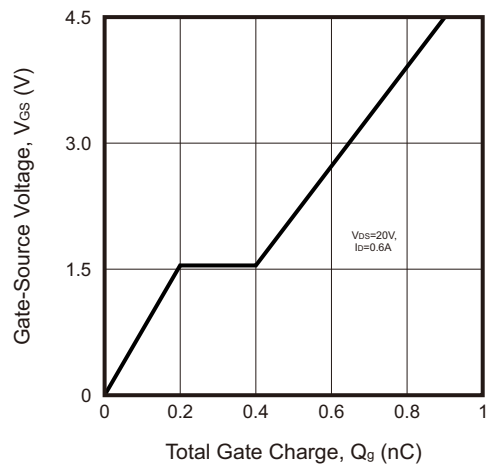


Fig.11 - Maximum Safe Operating Area

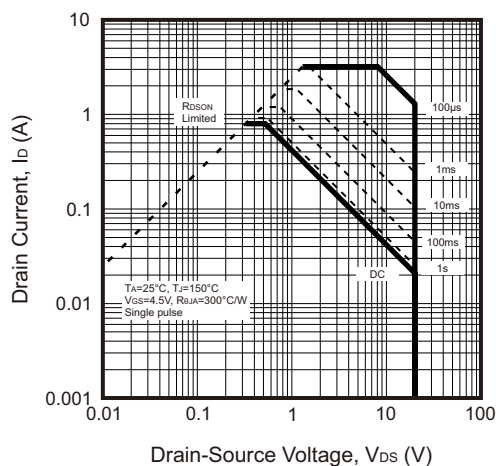
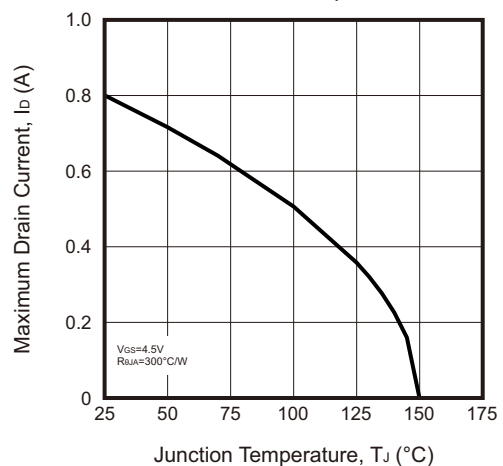
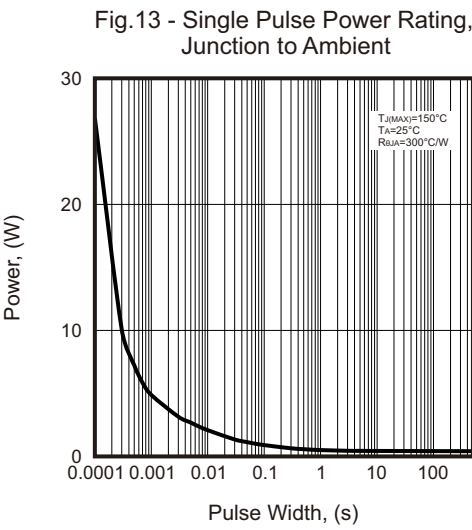


Fig.12 - Maximum Drain Current vs Junction Temperature



N-Channel Typical Rating and Characteristic Curves (CMS3439KDW-HF)



P-Channel Typical Rating and Characteristic Curves (CMS3439KDW-HF)

Fig.14 - Typical Output Characteristics

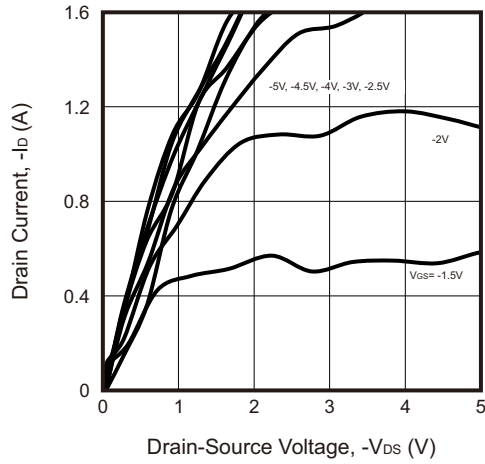


Fig.15 - Breakdown Voltage vs Junction Temperature

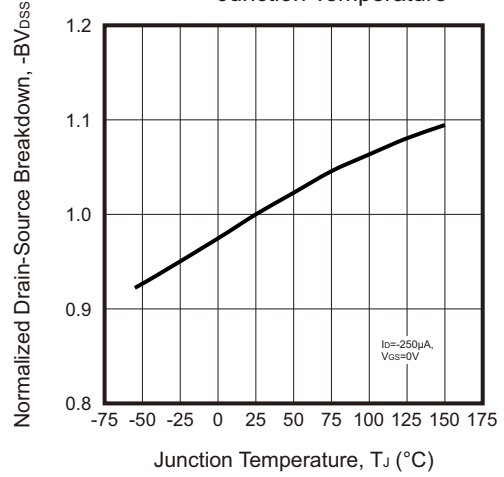


Fig.16 - Static Drain-Source On-State Resistance vs Drain Current

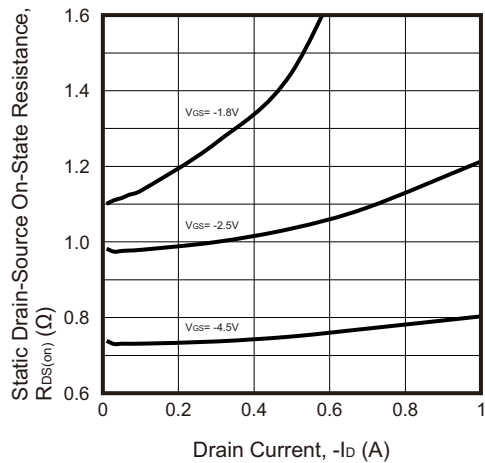


Fig.17 - Body Diode Current vs Source-Drain Voltage

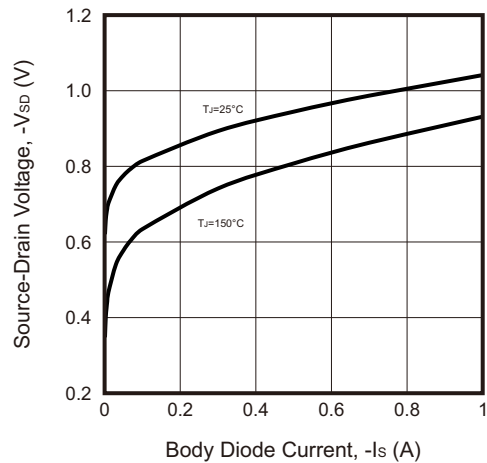


Fig.18 - Static Drain-Source On-State Resistance vs Gate-Source Voltage

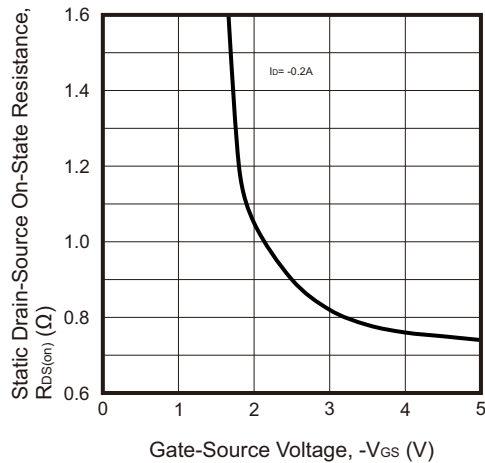
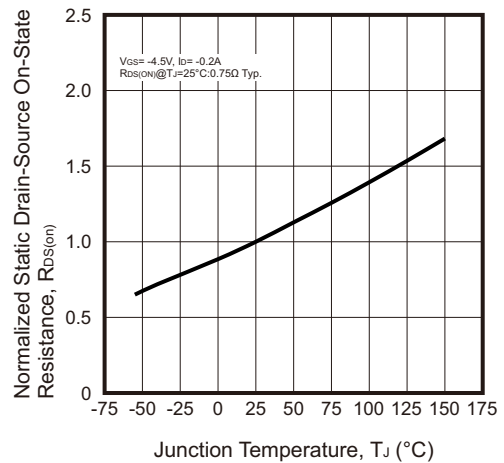


Fig.19 - Drain-Source On-State Resistance vs Junction Temperature



P-Channel Typical Rating and Characteristic Curves (CMS3439KDW-HF)

Fig.20 - Capacitance vs
Drain-to-Source Voltage

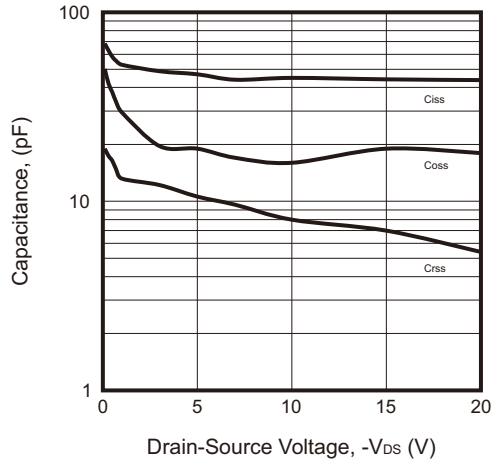


Fig.21 - Threshold Voltage vs
Junction Temperature

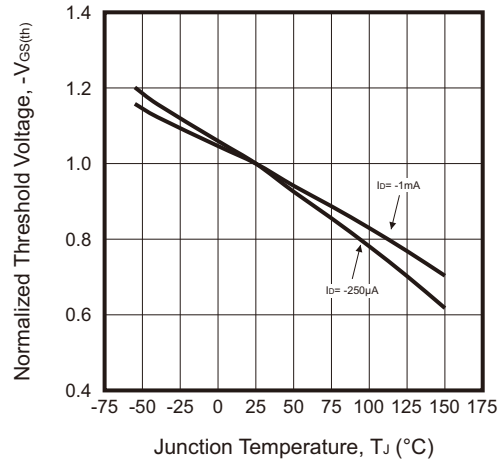


Fig.22 - Forward Transfer Admittance
vs Drain Current

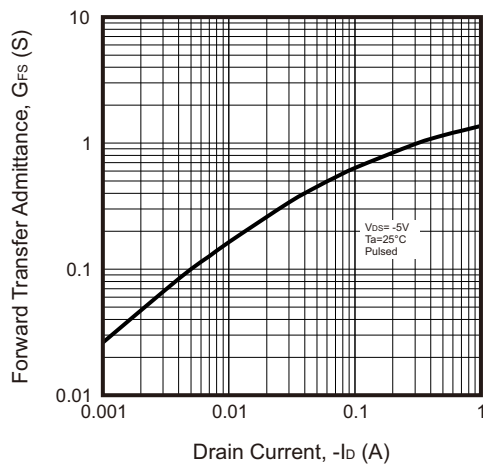


Fig.23 - Gate Charge Characteristics

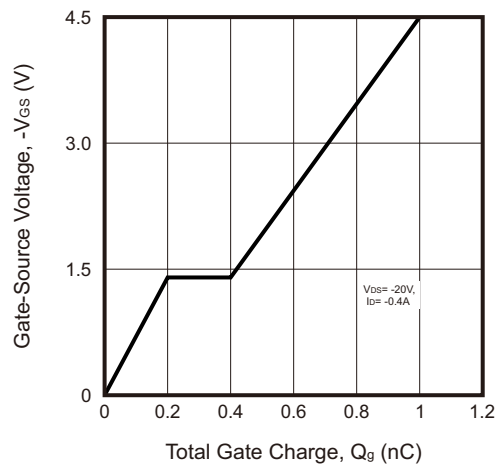


Fig.24 - Maximum Safe Operating Area

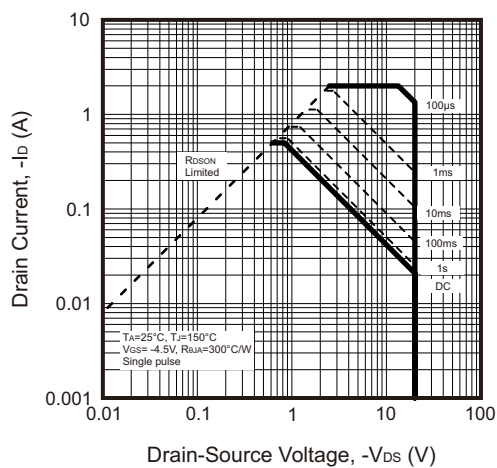
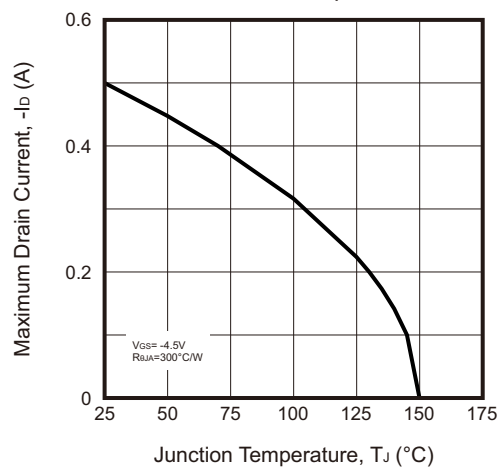
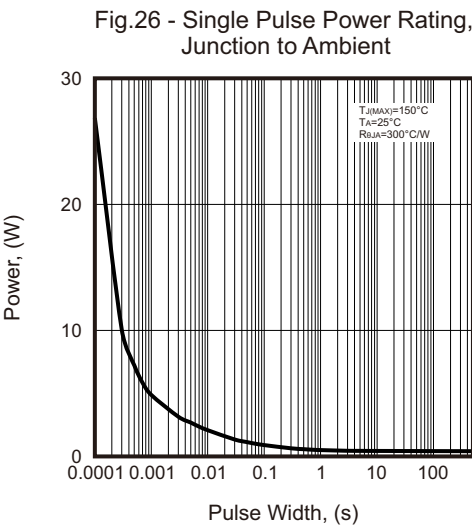


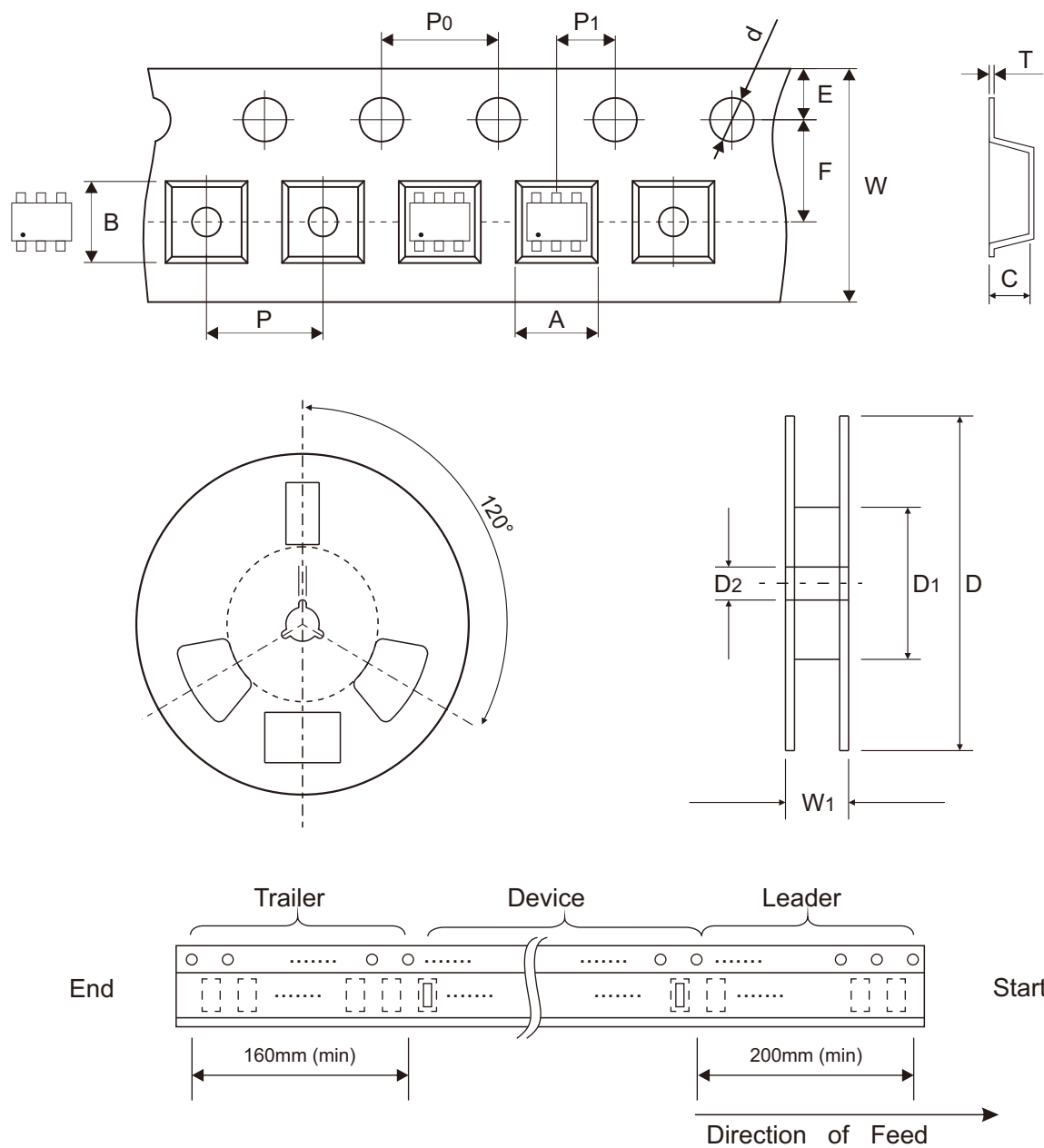
Fig.25 - Maximum Drain Current vs
Junction Temperature



P-Channel Typical Rating and Characteristic Curves (CMS3439KDW-HF)



Reel Taping Specification

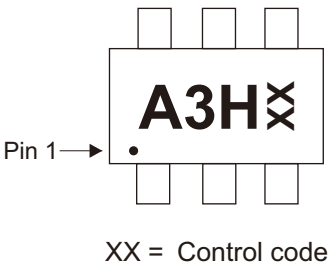


	SYMBOL	A	B	C	d	D	D1	D2
SOT-363	(mm)	2.40 ± 0.10	2.60 ± 0.10	1.20 ± 0.10	1.50 + 0.10 - 0.00	178.00 ± 1.00	54.00 ± 0.40	13.00 ± 0.20
	(inch)	0.094 ± 0.004	0.102 ± 0.004	0.047 ± 0.004	0.059 + 0.004 - 0.000	7.008 ± 0.039	2.126 ± 0.016	0.512 ± 0.008

	SYMBOL	E	F	P	P0	P1	T	W	W1
SOT-363	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	0.254 ± 0.02	8.00 + 0.30 - 0.10	12.30 ± 0.20
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.010 ± 0.001	0.315 + 0.012 - 0.004	0.484 ± 0.008

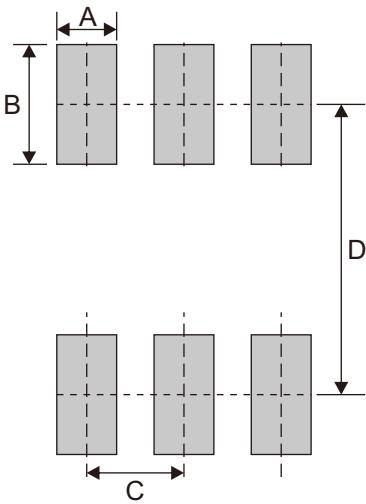
Marking Code

Part Number	Marking Code
CMS3439KDW-HF	A3H



Suggested P.C.B. PAD Layout

SIZE	SOT-363	
	(mm)	(inch)
A	0.40	0.016
B	0.80	0.031
C	0.65	0.026
D	1.94	0.076



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-363	3,000	7