

Features

- $V_{DS}=20V$, $I_D=6.5A$.
- $R_{DS(ON)}=15m\Omega@V_{GS}=4.5V(Typ.)$.
- $R_{DS(ON)}=19m\Omega@V_{GS}=2.5V(Typ.)$.
- High power and current handling capability
- Lead free product is acquired.
- Surface mount package.

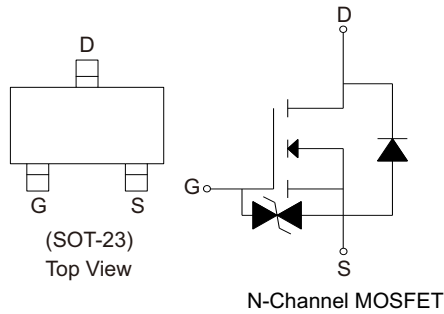
Mechanical data

- Epoxy : UL94V-0 rated flame retardant.
- Case : Molded plastic,SOT-23.
- Lead : Solder plated, solderable per MIL-STD-750, Method 2026.
- Weight : Approximated 0.008 gram.

Application

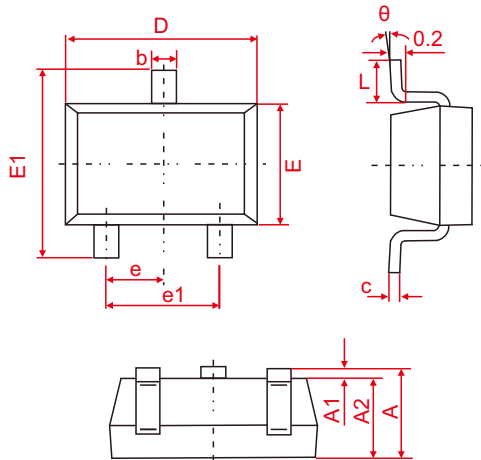
- Battery protection.
- Load switch.
- Power management.

Schematic diagram



Outline

SOT-23



Symbol	Min	Max
A	1.05(0.041)	1.25(0.049)
A1	0(0)	0.10(0.004)
A2	1.05(0.041)	1.15(0.045)
b	0.30(0.012)	0.50(0.020)
c	0.10(0.004)	0.20(0.008)
D	2.82(0.111)	3.02(0.119)
E	1.50(0.059)	1.70(0.067)
E1	2.65(0.104)	2.95(0.116)
e	0.95(0.037)BSC	
e1	1.80(0.071)	2.00(0.079)
L	0.30(0.012)	0.60(0.024)
θ	0°(0°)	8°(8°)

Dimensions in millimeters(inches)

Maximum ratings (Rating at 25°C ambient temperature unless otherwise specified.)

Parameters	Conditions	Symbol	MS3416G	Unit
Drain-source voltage		V_{DS}	20	V
Gate-source voltage		V_{GS}	±12	V
Drain current-continuous		I_D	6.5	A
Drain current-pulsed ^(Note 1)		I_{DM}	30	A
Maximum power dissipation		P_D	1.4	W
Thermal resistance ^(Note 2)	Junction to Ambient	$R_{\theta JA}$	89	°C/W
Storage temperature		T_{STG}	-55 ~ +150	°C
Operating junction temperature		T_J	-55 ~ +150	°C

Note:
1.Repetitive rating: Pulse width limited by maximum junction temperature.
2.Surface mounted on FR4 Board, $t_s \leq 10$ sec .

Electrical characteristics (T_A=25°C unless noted otherwise)

Parameters	Conditions	Symbol	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	V _{GS} =0V, I _D =250μA	BV _{DSS}	20			V
Zero gate voltage drain current	V _{DS} =20V, V _{GS} =0V	I _{DSS}			1	μA
Gate-body leakage current	V _{GS} =±10V, V _{DS} =0V	I _{GSS}			±10	nA
On characteristics (Note 3)						
Gate threshold voltage	V _{DS} = V _{GS} , I _D =250μA	V _{GS(th)}	0.45	0.7	1.0	V
Drain-source on-state resistance	V _{GS} =4.5V, I _D =6.5A	R _{DS(ON)}		15	25	mΩ
	V _{GS} =2.5V, I _D =5.5A			19	30	mΩ
	V _{GS} =1.8V, I _D =5A			25	40	mΩ
Dynamic characteristics (Note 4)						
Input capacitance	V _{DD} =10V, V _{GS} =0V , F=1MHz	C _{iss}		660		pF
Output capacitance		C _{oss}		160		pF
Reverse transfer capacitance		C _{rss}		87		pF
Switching characteristics (Note 4)						
Turn-on delay time	V _{DD} =10V V _{GS} =5V, R _{GEN} =3Ω	t _{d(on)}		0.5		nS
Turn-on rise time		t _r		1		nS
Turn-off delay time		t _{d(off)}		12		nS
Turn-off fall time		t _f		4		nS
Total gate charge	V _{DS} =10V, V _{GS} =4.5V , I _D =6.5A	Q _g		8		nC
Gate-source charge		Q _{gs}		2.5		nC
Gate-drain charge		Q _{gd}		3		nC
Drain-source diode characteristics						
Diode forward voltage (Note 3)	V _{GS} =0V, I _S =6.5A	V _{SD}			1.2	V

Note:

3.Pulse test: Pulse Width≤300μs, Duty cycles≤2%.

4.Guaranteed by design, not subject to production.

■ Rating and characteristic curves

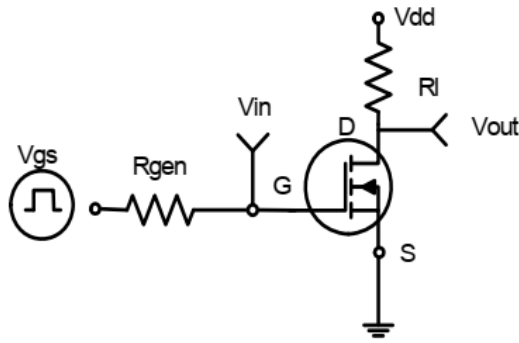


Figure 1: Switching Test Circuit

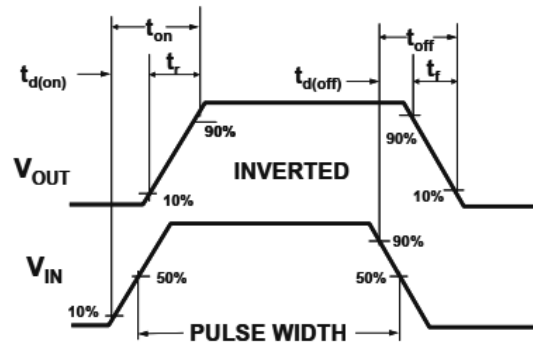


Figure 2: Switching Waveforms

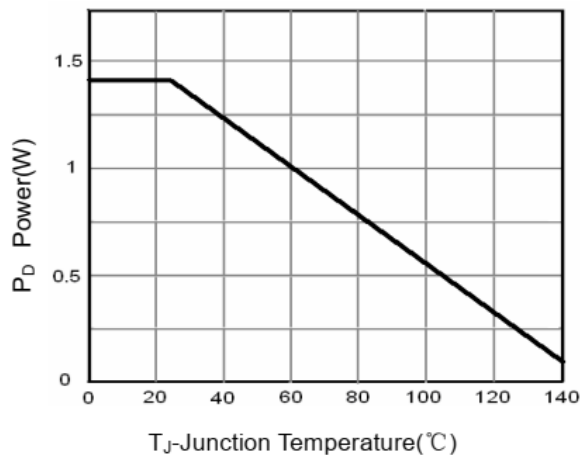


Figure 3 Power Dissipation

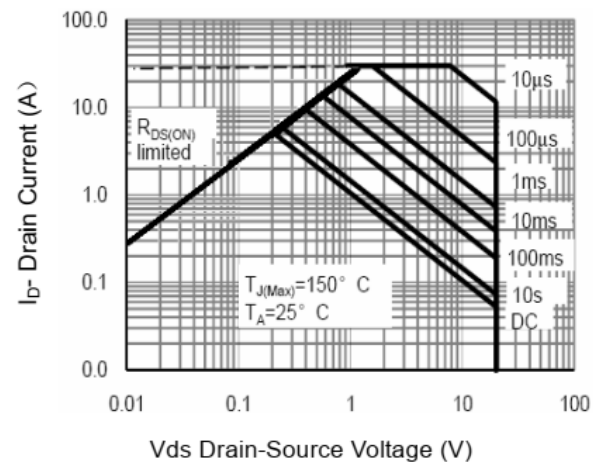


Figure 4 Safe Operation Area

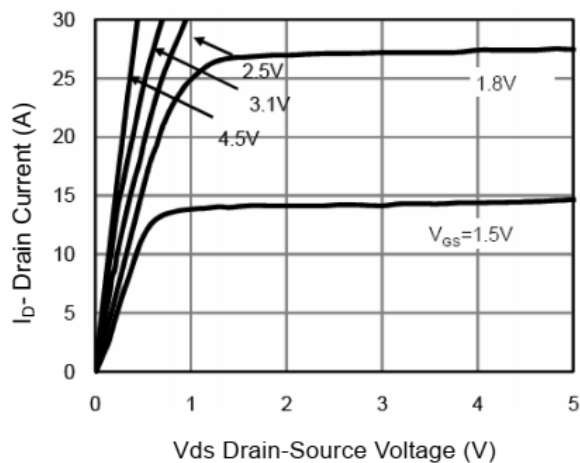


Figure 5 Output Characteristics

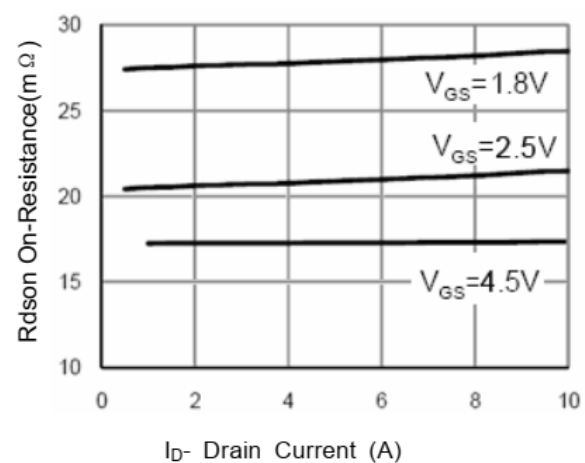
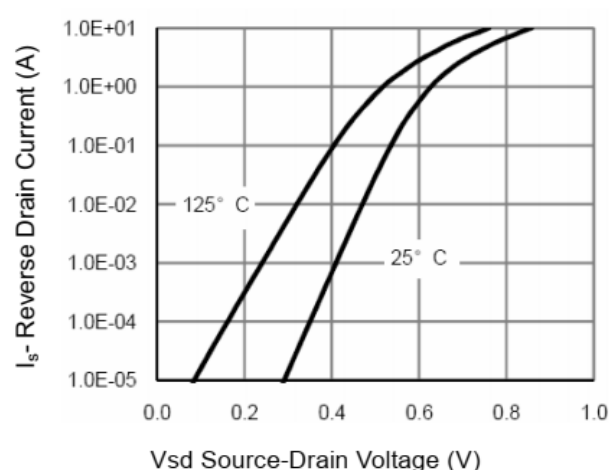
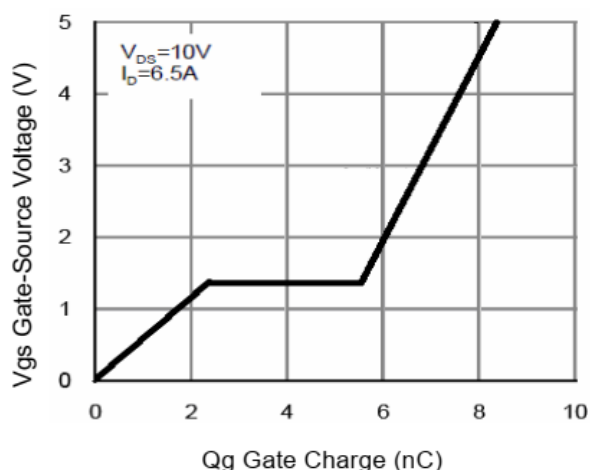
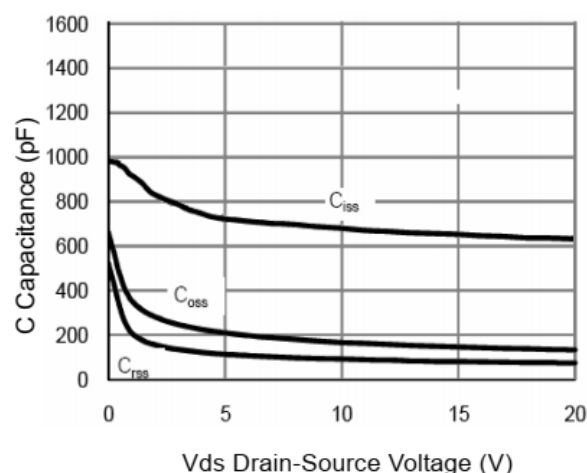
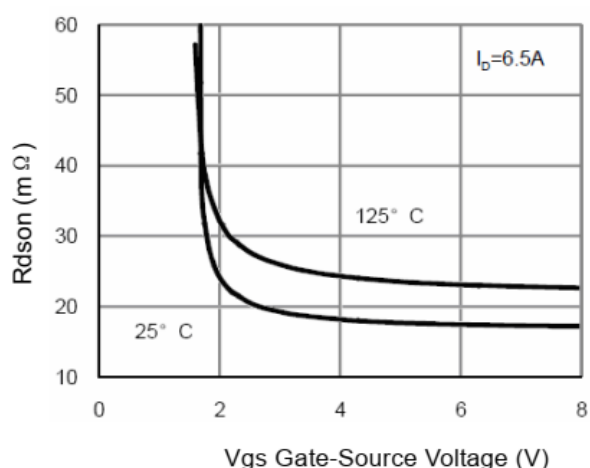
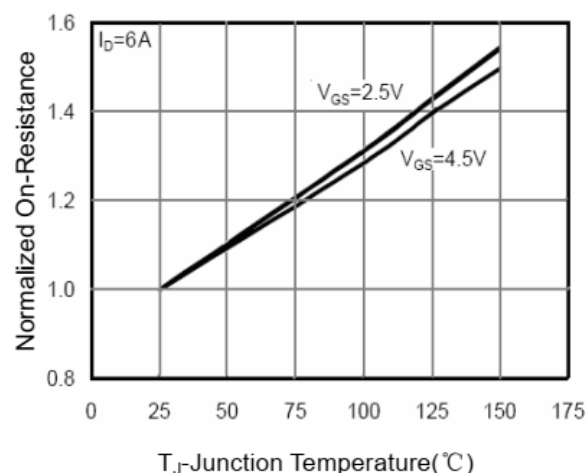
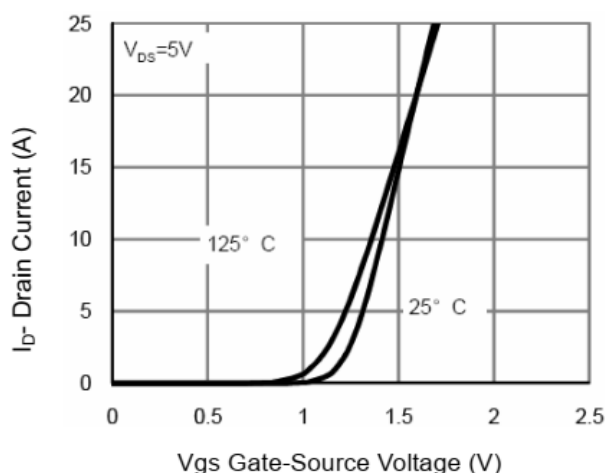
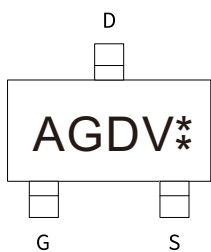


Figure 6 Drain-Source On-Resistance

■ Rating and characteristic curves



■ Marking information



AGDV : Product type marking code
* : Designates trace code

■ Ordering/Packing information

	Part number	Case	Q'TY/Reel (PCS)	Q'TY/Box (PCS)	Q'TY/Carton (PCS)
Halogen free	MS3416G	SOT-23	3,000	15,000	180,000

Notes : 1. For packaging details please reference our website at https://www.citcorp.com.tw/tw/All_Product.php

- The epoxy molding compound used for encapsulation may exhibit either a glossy or matte black surface finish, depending on material batch variation.
- Applicable to component leads with either bright or matte tin finishes, which may vary depending on material batch differences.
- This surface appearance variation is purely cosmetic, has no impact on product functionality, performance, or reliability, and is not considered a quality defect nor a basis for product rejection.
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